REGIONAL CO-OPERATIVE AGREEMENT

INTERNATIONAL ATOMIC ENERGY AGENCY

REPORT

19TH WORKING GROUP MEETING
OF
REPRESENTATIVES OF RCA MEMBER STATES

10-14 March 1997
Yangon, Myanmar

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INTRODUCTION

The 19th RCA Working Group Meeting was hosted by the Myanmar Atomic Energy Committee in Yangon from 10-14 March 1997. The meeting marked the 25th anniversary of the RCA which commenced in 1972. It was attended by 29 delegates from 15 visiting RCA Member States, 15 participants from Myanmar and 4 from the IAEA. Due to a sudden flight cancellation, Dr. Hasibullah of Pakistan was unfortunately unable to attend. The IAEA participants were Mr H S Cherif, Special Assistant to the Director General, Mr A El-Saiedi, Director, Division of Technical Co-operation Implementation, Mr K Yanagisawa, RCA Coordinator and Mr H Meyer, Public Information Division. The Myanmar Minister for Science and Technology, His Excellency U Thaung, officiated at the inauguration of the meeting on behalf of the Government of the Union of Myanmar.

The key organizers of the 19th RCA Working Group Meeting were Mr Aung Koe, Chairman of the Organizing Committee, Vice-Chairman of the Myanmar Atomic Energy Committee (MAEC) and Director-General of the Myanmar Scientific and Technological Research Department (MSTRD); Dr Tin Hlaing, Secretary of the Organizing Committee, Secretary of the MAEC and Director of the MSTRD; and Professor Dr Sein Htoon, Physics Department at Yangon University, Chairman of the Secretariat of the Meeting.

The full list of delegates and secretariat is attached as Annex 1.

INAUGURAL SESSION

The Inaugural Session was chaired by Prof Dr Sein Htoon, Yangon University.

1. Inaugural Address

The inaugural address was presented by His Excellency U Thaung, Minister of Science and Technology in Myanmar. The Minister expressed his pleasure in welcoming the delegates and his appreciation to the IAEA and UNDP for their valued support. He noted that the RCA represented a fine example of inter-governmental inter-regional cooperation and it was a known fact that in today's sophisticated world order, nuclear science and technology was inevitably in great demand. He emphasized that with the social, cultural and economic diversity in the Asia and Pacific Region, one would only experience "Unity in Diversity" in its framework where these nations formed a tightly knitted fabric in their dedication to co-operation in the field of nuclear science and technology. He concluded that since the arrival of the delegates coincided with the "Visit Myanmar Year", the whole of Myanmar welcomed the delegates of all Member States. The full text of the Minister's speech is at Annex 2a.

2. Welcome Addresses

The Welcome Address on behalf of the Organizing Committee was given by Mr Aung Koe, Vice Chairman of the Myanmar Atomic Energy Committee and Director General of the Myanmar Scientific and Technological Research Department, who encouraged the meeting to develop ongoing plans for future activities which would promote nuclear science and technology to benefit the development and well-being of the people of the Region. The full text of Mr Aung Koe's speech is attached as Annex 2b.

The welcome address on behalf of the IAEA was delivered by Mr A. El Saiedi, Director, TCIM, who conveyed the Agency's compliments to the Government of Myanmar and expressed the Agency's appreciation to Myanmar for agreeing to host this important annual event which on this occasion coincided with the celebration of the 25th anniversary of the establishment of the RCA. He also conveyed greetings to the delegates on behalf of Mr Qian, Deputy Director General for Technical Co-operation. He noted that the joint UNDP/RCA/IAEA project on Isotopes and Radiation to Strengthen Environmentally Sustainable Development had terminated in the end of 1996 and that this project had helped introduce to Member States technologies in the fields of Tracers and Nucleonic

Control Systems, Non-Destructive Evaluation, Radiation Technology and Nuclear Analytical Techniques and had helped promote the peaceful uses of nuclear techniques in industry and the environment. He noted that the Agency had been a major financial contributor to the RCA co-operative activities and that it would continue to fulfill this role as long as the requests for contribution met the objectives of the Agency's new Technical Co-operation Strategy. He concluded that he and Mr Cherif looked forward to learning of the delegates' views on how the Agency and Member States could best achieve the mutual objective of keeping RCA strong and effective. The full text of Mr El Saiedi's speech is attached as Annex 2c.

FIRST ADMINISTRATIVE SESSION

3. Election of Chairperson for the 19th Working Group Meeting

Mr Zhu Jiang, RCA Coordinator in China, took the chair on behalf of Dr Li Donghui and invited nominations for Chairperson of the 19th WGM. Dr Tin Hlaing, National Co-ordinator of Myanmar, was nominated by Japan and seconded by Bangladesh and was unanimously elected Chairperson. The RCA Co-ordinator outlined the Curriculum Vitae of Dr Tin Hlaing (attached as Annex 3).

4. Adoption of Agenda

The Draft Agenda as at Annex 4 was adopted, subject to adding a new item (14) "RCA in the Next 25 Years" and adding item (15) "Other Business" to include a decision on the date and venue of the 20th WGM. The remaining agenda items were to be renumbered accordingly.

5. Election of the Chairpersons for Project Committees

Chairpersons and rapporteurs for the Project Committees were nominated and elected as shown in Annex 5.

6. Presentation of Draft RCA Annual Report for 1996

The RCA Co-ordinator presented the Draft RCA Annual Report for 1996 dated March 1997 as circulated at the meeting. The Annual Reports submitted by various Member States were also noted with interest. The RCA Co-ordinator commented that the implementation rate for RCA projects varied over a wide range, averaging 85% over the total life span of the operational projects and 54% for 1996 alone.

The meeting expressed concern at the late circulation of the Draft Annual Report and that the Report had to be reissued. Following discussion of the Annual Report, the meeting -

(i) *Noted* the various detailed comments made on aspects of the Draft Annual Report at this meeting and invited all National Co-ordinators to submit any detailed comments on the Draft Annual Report to the RCA Coordinator in writing by the end of June 1997. (Comments from Mongolia were circulated at the meeting.)

(ii) *Agreed* that the format of future Annual Reports should be in line with Recommendation 5 of the Report of the Review of the RCA Management Structure as endorsed at the RCA General Conference Meeting in September 1996.

(iii) *Agreed* that the 12 recommendations from the Working Paper on the Review of the RCA Management should be included in the Annual Report.

(iv) *Agreed* that the information sought from RCA Member States for the Annual Report was too detailed and that a standardized format should be developed for submission to the 1997 RCA GCM which should emphasize policy aspects, project impacts and achievements, and in-kind contributions.

(v) *Agreed* that Table 3.3 in the Draft Annual Report, which recorded only cash contributions by Member States to the RCA, should be revised to also include in-kind contributions.

(vi) *Agreed* that information on the implementation rate of projects in the Annual Report should not only be based on financial data but also on project milestones and achievement indicators.

7. Submission of Country Statements

Country statements were submitted and *noted* as at Annex 6.

FIRST TECHNICAL SESSION

8a. Agriculture (Chairman: Mr Than Hla, Deputy Director, Ministry of Livestock and Fisheries)

The meeting observed that the only ongoing project in the agriculture area was "Public Acceptance and Trade in Irradiated Foods" (RAS/0/022) which was a "footnote-a" project. Following discussion, the meeting -

(i) *Expressed* concern at the lack of projects in the agriculture area and encouraged Member States to submit well formulated projects which contained a nuclear component and did not overlap the responsibilities of the FAO or WHO.

(ii) *Noted* copies of three draft project proposals as circulated by China on "Plant Mutation Breeding" (Annex 7a), "Yak Production in the Hindu Kush-Himalayan Region" (Annex 7b) and "Improving Productivity and Reproductivity of Dairy Cow and Buffalo with the Aid of Progesterone Enzymeimmunoassay" (Annex 7c). It was noted that the first and third project proposals involved very few RCA Member States at this stage and had a limited nuclear content, while the second involved a number of non-IAEA Member States. China undertook to consider the justification for the project proposals further and to resubmit them to the RCA General Conference Meeting as appropriate.

(iv) *Noted* that a new project associated with the closed project on "Increasing the Capacity of Common Grain Legumes" (RAS/5/021) could be considered.

(v) *Invited* the Agency to consider the wider regional interest in transferring the two non-RCA regional projects "Nuclear Techniques for the Promotion of Agroforestry Systems" (RAS/5/029) and "Feed Supplementation and Animal Production Strategies" (RAS/5/030) as RCA Projects.

(vi) *Requested* the Secretariat to arrange for the interest in developing a thematic RCA project in the agriculture area to be examined.

8b. Industry and Environment (Chairman: Dr Sein Htoon, Professor of Physics, Yangon University)

The Chief Technical Officer (CTO), Prof P Hien, summarized the findings of the Draft Terminal Report for the Joint UNDP/RCA/IAEA Project on "The Use of Isotope and Radiation to Strengthen Technology and Support Environmentally Sustainable Development" (RAS/92/073) as circulated. A number of comments were offered with regard to aspects of the draft report. It was noted that a final tripartite review meeting for the project was scheduled to be held following the present Working Group meeting on 14-15 March.

The RCA Co-ordinator reported on the actions that have been taken to date with regard to the new Joint UNDP/RCA/IAEA Project "Better Management of Environmental and Industrial Growth" (RAS/8/076) by referring to the document at Annex 8a. He advised that financial support from the UNDP in New York was still under consideration. Several Member States, including New Zealand, sought clarification as to the apparent decrease in the planned overall budget of the new Joint Project. The RCA Co-ordinator outlined the present status of sub-projects to be involved in the new Joint project by referring to the summary document at Annex 8b.

Following discussion of the draft Terminal Report and the new Joint Project proposal, the meeting -

(i) *Expressed* its appreciation to the CTO for his positive contribution to the success of the Joint UNDP/IAEA/RCA Project over the last three years.

(ii) *Agreed* that any comments on matters of fact and any suggestions and recommendations from Member States on the text of the draft Terminal Report be provided to the RCA Co-ordinator with a copy to Mr John Rolland (Australia) within the next two weeks.

(iii) *Agreed* that an extended summary of the draft Terminal Report be prepared by Mr John Rolland (Australia), Dr Peter Roberts (New Zealand) and the RCA Co-ordinator for submission by the Agency to the UNDP within 4 weeks to take account of comments made on the draft by the Agency and Australia. The basic report should remain unaltered.

(iv) *Agreed* that the Agency should be invited to contact the UNDP in New York at a high level to ascertain the likely timing of a decision by the UNDP on funding the new Joint Project, any outstanding issues requiring clarification by the UNDP and the need for any further information from Member States.

(v) In view of the reported likely decrease in UNDP funding for the new Joint Project, the meeting established a Working Group to make recommendations on priorities as guidance where there were competing demands on available funds. The Working Group comprised Dr Aleta (Philippines) as chairman, Prof Djaloeis (Indonesia), Dr Roberts (New Zealand), Dr Kume (Japan), Dr Gangadharan (India), Mr Jayasinghe (Sri Lanka) and the RCA Co-ordinator. Dr Aleta subsequently reported that the working group had considered the priorities against the factors of;

◊ What is important to the Region, and whether or not it is covered by any existing project proposal;

◊ Where nuclear techniques would be predominantly useful; and

◊ The economic impact.

The Working Group recommended the priorities in order of (1) drinking water, (2) clean production processes, (3) marine coastal environment, and (4) air pollution. These priorities were *agreed.* It was noted that there were no current proposals in the field of drinking water and Member States were encouraged to develop suitable proposals in this field.

The RCA Co-ordinator explained that the new project "Thematic Programme on Advanced Techniques for Industry" (RAS/8/077), with its two sub-projects on Polymers and Non-Destructive Testing and Evaluation, would be funded by Japan as a "footnote a" project. The new project "Nucleonic Control System and Tracers in Industry" (RAS/8/078) would be funded by the Agency.

The RCA Coordinator advised that the following two new project proposals had been received for consideration:

<u>Nuclear Information System</u>

The first project proposal was "Sustainable Nuclear Information Network in RCA Member States" as at Annex 9a. A project formulation meeting had been held on 26-28 February 1997 in Vienna. The RCA Co-ordinator drew attention to the Terminal Report as at Annex 9b on the related closed project "Nuclear Information System" (RAS/0/019) as also considered at the meeting in

February. Following discussion, the meeting -

(i) *Noted* the Terminal Report on RAS/0/019 "Nuclear Information System".

(ii) *Agreed* to support the proposed new project on "Sustainable Nuclear Information Network in RCA Member States" in principle following support by New Zealand, the Philippines and Republic of Korea, subject to expressing concern at the extent of the proposed resource requirements.

(iii) *Agreed* to refer the above project proposal to a project formulation meeting for the new Joint RCA/IAEA/UNDP Project. The project formulation meeting should ensure that the proposed project objectives could be met. The stated objective of strengthening the telecommunication and other infrastructure required by Member States was considered desirable but unrealistic within the likely budget constraints.

(iv) *Agreed* in principle to establish an RCA Home Page as at Annex 9c (as proposed in the new project proposal) within the framework of the IAEA Department of Technical Cooperation Home Page.

(v) *Agreed* that National Coordinators should provide responses to the RCA Co-ordinator by the end of April 1997 on the questions listed at the end of the Home Page proposal at Annex 9c.

(vi) *Requested* the RCA Coordinator to ensure that information proposed for inclusion on the Home Page was accurate and regularly updated, and *recommended* that National Information Project Coordinators be responsible for this task.

(vii) *Agreed* that the Home Page proposal be discussed at the next National Information Coordinators meeting in June 1997, with specific proposals being prepared for consideration at the RCA GCM.

Red Tide (Algal Bloom)

The second project proposal "Applications of Nuclear Techniques to Address Specific Red Tide Concerns" as at Annex 9d was submitted by Dr Aleta on behalf of the Philippines, Malaysia and Indonesia. The project was proposed to be carried out within the Marine Environment subproject of the new Joint Project. Funding support from the Philippines Government of US$50,000 was expected. New Zealand advised that a meeting held in Monaco in 1995 had considered possible projects in the marine environment and that the Red Tide problem had been specifically mentioned and was well suited as part of any overall programme. The meeting *agreed* to support the proposal in principle and recommended that it be considered with any other marine environment proposals at a project formulation meeting for the new Joint Project after decisions had been made on funding by UNDP.

<u>8c. Research Reactor, Energy Based And General</u> (Chairman: Mr Soe Myint, Director General, Energy Planning Department, Ministry of Energy)

The RCA Co-ordinator reported that the projects "Energy and Nuclear Power Planning" (RAS/0/013), "Research Reactor Utilization" (RAS/4/011), and "Training Course on Regulatory Control of NPPs" (RAS/9/016) had been closed. It was noted that the ongoing project "Energy, Electricity and Nuclear Power Planning" (RAS/0/023) was funded by the Agency.

Korea presented the report from the Regional Workshop on Effective Strategies for Nuclear Power Programmes in RCA Countries held in Korea on 12-16 June 1996 as at Annex 10a and a prospectus for an RCA Regional Training Course on "Nuclear Power Project Planning and Implementation" to be held in Korea on 8-29 October 1997 as at Annex 10b. Korea indicated its further extrabudgetary financial support for these projects. Following discussion, the meeting -

(i) *Noted* the proposed action plan included on page 8 of the report from the Regional Workshop as the basis for defining the scope of the continuation of the project "Nuclear Power Planning" (RAS/0/021).

(ii) *Agreed* to combine activities 2 and 3 in the above action plan, ie the workshop on economics and financing aspects of NPPs and the workshop on strategies for localization, standardization and technology transfer.

(iii) *Agreed* that consideration should be given to combining activities 4 and 5 depending on the available funding and the outcome of the mid-term project review meeting to be held in Korea in October 1998.

(iv) *Endorsed* the prospectus for the Regional Training Course on Nuclear Power Project Planning and Implementation to be held in Korea in October 1997.

(v) *Noted* the recent death of the IAEA Technical Officer Mr Pablo Molina and expressed its appreciation for his excellent work in energy related RCA projects.

8d. Human Health (Chairman: Dr Daw Win Mar, Head of Nuclear Medicine, Ministry of Health)

The meeting *noted* the summary at Table 3 in the report as circulated of the EAGM on the Formulation of a Thematic Programme on Health Care held in Vienna 4-8 November 1996 as the basis for developing an RCA thematic programme in human health. The meeting *endorsed* the proposed activities and budgets for 1997 as follows;

	Proposed Budget US$M	Actual Budget US$M
RAS/6/028 "Thematic Programme on Health Care"		
Sub-project 1 "Nuclear Instrument Maintenance"	$0.258	$0.182
Sub-project 4 "Enhanced Production and QC of Radioisotopes and Radiopharmaceuticals	$0.079	$0.079
Sub-project 5 "Radioimmunoassay of Tumour Markers for the Detection and Management of Cancer"	$0.200	$0.109
RAS/6/027 "Increasing the Scope of Clinical Brachytherapy with QA"	$0.123	$0.123
RAS/7/008 "QA in Radiation Sterilization of Tissue Grafts"	$0.373	$0.373
RAS/6/029 "Regional Education of Nuclear Medicine Technologists"	$0.129	$0.129

The RCA Co-ordinator explained that RAS/4/008 "Nuclear Instrument Maintenance" had been closed and the activity transferred to a sub-project of RAS/6/028. The project RAS/6/016 "Use of Computers in Tc-99m Imaging" funded by Australia has also been closed.

The RCA Co-ordinator advised that the project "Radioimmunoassay for Hepatitis B Diagnosis" (RAS/6/018) had its terminal review meeting on 3-7 March 1997 in Beijing. This project will be continued as a sub-project of

RAS/6/028; clarification was however required on whether Hepatitis C diagnosis would be included in the new project. The project RAS/6/026 "Training Course on Quality Assurance in Radiation Therapy Dosimetry" is closed. The project "Strengthening Nuclear Medicine in RCA Member States" (RAS/6/022) funded by Australia will be continued as RAS/6/029.

Japan reminded the Secretariat of the need to commence implementation of the Japan funded project on the use of Co-60 for brachytherapy which was proposed and endorsed last year. Japan asked for this project to be included in the list of RCA activities for 1997-98.

The RCA Co-ordinator advised that the project "Radiation Sterilization of Tissue Grafts" (RAS/7/003) had its terminal meeting in Brisbane, Australia in October 1996 and its activity will be carried over as RAS/7/008. The CRP "Evaluation of Imaging Procedures on the Diagnosis of Liver Diseases" was closed.

Singapore proposed the following addition to para 6.2.4 of the Report of the 25th RCA General Conference Meeting: "Dr Nather presented a proposal from Singapore to set up a regional training centre on tissue banking in Singapore for the RCA. The proposal was seconded by Malaysia and was unanimously endorsed." Thailand then made a statement as at Annex 11a. The meeting noted Thailand's statement. Singapore said that it was surprised that Thailand's reservation to the setting up of the Regional Training Centre on Tissue Banking (RTC) was raised now, long after Singapore's proposal had been presented at both the RCA 18th RCA WGM in Beijing and the 25th GCM in Vienna. Singapore, together with other delegations, said that it was regrettable that Thailand had not expressed its reservation to Singapore's proposal at the two earlier meetings. Singapore added that its country had to date committed both funds and other resources in the setting up of the RTC. The 19th RCA WGM confirmed that Singapore's proposal had indeed been presented and endorsed at the meeting in Vienna. Singapore sought clarification from the RCA and the Agency on the matter. In this connection, the meeting was also informed that Singapore had already sent three letters (Oct 1996, Feb 1997 and March 1997) to the RCA Coordinator and the Agency.

To find a solution on the issue of the RTC, a Working Party consisted of delegates from Singapore, Thailand, Malaysia, Indonesia, Japan and the RCA Co-ordinator was formed. The Working Party subsequently reported on the outcome of its discussions as at Annex 11b and this report was *endorsed* by the meeting. In accepting the resolution, Singapore said that while it had agreed in the spirit of the RCA, it was concerned that this incident could set a precedent for future decisions of the RCA Annual Meeting to be re-opened and re-discussed. Singapore expressed the hope that this should not be allowed to happen again in the interest of future co-operation. Many delegations agreed with the remarks by Singapore. Singapore also requested that the report of the 25th General Meeting in Vienna be amended accordingly to set the record straight and this was *agreed.*

8e. Radiation Protection And Waste Management (Chairman: Prof Kyee Myint, Head Physics Department, Mandalay University)

Korea summarized the main outcomes from the National Co-ordinators Meeting and Project Formulation Meeting for the Project to Strengthen Radiation Protection Infrastructures (RAS/9/018) held at Taejon, Korea on 24-28 February 1997. The report from this NCM meeting at Annex 12a included the proposed work plan for Phase III of the project which is to be titled "Enhancement and Harmonization of Radiation Protection". The project "Preparation for Disposal of LILW from Non-Power Sources" (RAS4/016) was also reviewed. Following discussion, the meeting -

(i) *Endorsed* in principle the recommendations and conclusions from the report of the February 1997 NCM meeting.

(ii) *Agreed* that a National Co-ordinators Meeting be held in 1997 for the new project "Preparation for Disposal of LILW from Non-power Sources" (RAS/4/016) and *noted* that this meeting would be jointly funded by Japan and the Agency.

(iii) *Endorsed* the draft prospectus for a Regional Training Course within the above new project funded by Korea on "Disposal of Low and Intermediate Level Waste with Emphasis on Non-Power Sources" to be held in Korea on 14 October-4 November 1998 as at Annex 12b, subject to two deletions limiting participation to only those countries having nuclear power programmes.

8f. TCDC (Chaired by Dr Myint Khine, Director, Ministry of Science and Technology)

Prof Djaloeis (Indonesia) and Mr Rolland (Australia) outlined the activities undertaken to date within the RCA and the other two Regional Agreements to further encourage the TCDC modality. The meeting placed importance on the further implementation of TCDC initiatives and in this regard -

(i) *Noted* that a full paper dated July 1996 had been prepared outlining the current status and future prospects of TCDC within the RCA Programme, and that this paper had been submitted to a RCA/AFRA/ARCAL Tripartite Meeting held in Vienna on 29-31 July 1996.

(ii) *Noted* that a set of 15 recommendations had been developed at the above Tripartite Meeting as recorded on pages 5-7 of the draft 1996 RCA Annual Report.

(iii) *Noted* that the above 15 recommendations had been endorsed at the RCA GCM held on 18 September 1996.

(iv) *Noted* that the Tripartite Meeting held on Vienna on 19 September 1996 had further endorsed the outcomes of the Tripartite Meeting held in July 1996 and *noted* that recommendations 1, 2, 4 and 6 required action by the IAEA, recommendations 3 and 11 by the Regional Agreements, and Recommendations 5, 7, 8, 9, 10, 12, 13, 14 and 15 jointly by the IAEA and Regional Agreements.

(v) *Noted* that the Tripartite Meeting held in 19 September 1996 had made six further recommendations for implementing a TCDC strategy, including that each Regional Agreement should prepare a report for consideration at the next Tripartite Meeting in September 1997 as to their experience in implementing the 15 recommendations and also some specific examples of TCDC activities.

(vi) *Agreed* that to assist in implementing the above decision, Member States should submit information to the RCA Co-ordinator by the end of June as to the impacts derived through past TCDC activities; the present status of TCDC; and future prospects and opportunities seen for TCDC in the Region.

(vii) *Noted* the advice of the RCA Co-ordinator that the Agency had recently completed a paper with a set of proposed actions for developing a strategy for promoting TCDC within the three Regional Agreements and that this strategy was based on the outcomes of the Tripartite Meeting held on 19 September 1996. The RCA Coordinator undertook to circulate copies of this strategy paper promptly to all RCA National Coordinators.

(viii) *Agreed* that it was important to maintain momentum in implementing a RCA TCDC action plan and encouraged the RCA Co-ordinator to take an active role in pursuing the range of agreed actions.

(ix) *Agreed* to appoint Dr Sobri (Malaysia) as the RCA TCDC Contact Point assisted by Professor Djaloeis (Indonesia), Dr Aleta (Philippines) and Mr Rolland (Australia).

(x) *Recommended* that a project formulation meeting should be held to implement Project RAS/0/025 "Development of TCDC in Asia and the Pacific". (This project replaces the previous RAS/0/015).

SECOND ADMINISTRATIVE SESSION

Chairman: Dr Tin Hlaing, Director, Ministry of Science and Technology

9. RCA Management

Mr Rolland (Australia) summarized the present status of the initiative for improved management arrangements for the RCA as outlined in the working paper at Annex 13a on "The Implementation of Recommendations from the Review of the Management Structure of the RCA Programme". The Working Paper attached the Report of the Working Group to Review the Management Structure of the RCA Programme and Develop Proposals for the Future, which was endorsed in principle at the RCA GCM held on 18 September 1996, and comments on the Report from the IAEA Technical Cooperation Department, New Zealand and Viet Nam.

Mr Cherif (IAEA) then presented the document "Draft Guidelines and Operating Rules for the RCA" as at Annex 13b.

Dr Aleta (Philippines) drew attention to the IAEA legal opinion prepared in 1988 as at Annex 13c on the differences between RCA Working Group, General Conference and Project Committee meetings.

Korea indicated that the RCA should give particular attention to the needs of least developed countries (LDCs). The IAEA noted that the needs of LDCs receive special emphasis in the New TC Strategy and that SAGTAG will be considering this matter further at its next meeting.

Following discussion, the meeting -

(i) *Agreed* that Recommendations 1-10 and 12 in the RCA Management Working Paper at Annex 13a should take immediate effect as policy objectives within the RCA Programme, with any necessary implementation details being developed as soon as possible.

(ii) *Noted* that the above recommendations placed actions and obligations on both the Agency and Member States.

(iii) *Agreed* that Recommendation 11, which relates to locating a senior RCA representative in the Region by January 2000, should be separately examined with the view of submitting a report on the issue to the RCA GCM on 1 October 1997.

(iv) *Agreed* that RCA Working Group Meetings should in future become a "Meeting of Representatives", as for General Conference Meetings, pursuant to Article II of the RCA Agreement. It was *agreed* that the best description of these meetings needed to be further considered.

(v) *Endorsed* in principle the Draft RCA Guidelines and Operating Rules which were seen as complementary to the recommendations in the Working Paper, and thanked Mr Cherif for his initiative in preparing this document. Any detailed comments from Member States on the Draft Guidelines and Rules were invited to be sent to Mr Cherif by the end of May with a view to agreeing to the document at the RCA GCM.

(vi) *Noted* the need for RCA programmes to take particular account of the needs of least developed Member States.

10. RCA Extension

The RCA Co-ordinator reported that 13 Member States had so far responded on the draft text for the extension of the RCA Agreement. The remaining four Member States undertook to facilitate their approval urgently but before June 1997.

11. Overview of RCA Projects For 1997

The RCA Co-ordinator overviewed the RCA projects current in 1997 as summarized in Annex 14. The RCA Co-ordinator and Mr El Saiedi then reviewed the list of RCA and Regional Training Courses scheduled to be held in 1997 as at Annexes 15a and 15b. The meeting -

(i) *Noted* that the venue and time of the majority of the RCA training courses planned in 1997 were not yet finalized. National Coordinators were requested to urgently provide proposals on locations and timing of specific training courses to the Agency by the end of June at the latest.

(ii) *Agreed* that wherever possible lecturers for RCA training courses should be selected from RCA countries. It was noted that this recommendation was also included in the report of the July 1996 Tripartite TCDC meeting.

(iii) *Agreed* that letters of invitation for RCA training events should be copied by the RCA office to the relevant National RCA Coordinator and the relevant Project Co-ordinator in addition to the formal letter to the Mission.

12. Project Proposals for 1999-2000 Cycle

Dr Makuuchi (Japan) presented a project proposal entitled "Application Center for Low Energy Electron Beams" as at Annex 16a. The proposal was supported by a number of Member States including China which circulated a supplementary paper on "Concept Design of the Electron Accelerator Facility Systems Used for Irradiation Processing" as at Annex 16b. It was *agreed* that more detailed information should be provided by Japan to Member States before the General Conference meeting, including the proposed budget, quantifiable objectives, market assessment, management arrangements as a regional facility possibly involving an advisory committee, its location, and maintenance arrangements.

13. 25th Silver Jubilee Anniversary Celebration

The meeting congratulated Myanmar on the positive manner in which it had arranged to celebrate the 25th Silver Jubilee Anniversary of the RCA during the course of the present Working Group Meeting. This included an Exhibition and a 25th Anniversary Celebration at which addresses were made by Dr Tin

Hlaing, Chairman of the Working Group Meeting; Mr Cherif, Special Assistant to the IAEA Director General; and Dr Aleta (Philippines), the most senior RCA National Coordinator. Copies of the addresses are at Annexes 17a, b and c. The meeting welcomed the assistance provided by Mr Meyer, IAEA Public Information Division in the establishment of the Exhibition.

To follow up the proposal made by the Philippines at the last RCA General Conference Meeting, Japan proposed to also mark the Silver Jubilee of the RCA on the occasion of the RCA General Conference Meeting to be held at Vienna on 1 October 1997. Dr Aleta (Philippines) noted that the event could also include the signing of the extension of the RCA Agreement. Mr El Saiedi noted that the 40th anniversary of the IAEA would also be celebrated at the General Conference this year. In order to promote the proposal, the meeting -
(i) *agreed* that the 25th anniversary of the RCA should be marked at the time of the 1997 General Conference both within the Agency and at the national level
(ii) *established* a small Working Party consisting of the delegates from Japan (chairman), Indonesia, Korea and the Philippines to work with the RCA Co-ordinator in developing the necessary actions, time schedule and funding. It was suggested that these actions should include the preparation of a booklet describing RCA achievements The outcome of this discussion should be circulated to other National C-ordinators.

14. RCA in the Next 25 Years

There was a positive discussion of the future directions of the RCA. Indonesia spoke of the role of the RCA in enhancing the security, safety and the welfare of the Region; the need to strengthen TCDC; the need to devise better projects with significant impacts; and improved management arrangements. Australia drew attention to the vision statement included on page 21 of the Report of the Working Group Meeting to Review the Management Structure of the RCA Programme as at Annex 13a and the need to broaden the RCA's links with international organisations. Each National Coordinator undertook to submit any additional views on their future vision for the RCA by the end of June to the RCA Co-ordinator.

Sri Lanka made a submission expressing the view that the RCA should assist least developed countries (LDCs) in the Region to bring the benefits of nuclear technologies to end users in LDCs by exploring the possibility of raising "Development Finance" from the Region within the framework of the RCA. Such Development Finance may be available from organizations for overseas development in donor countries or from lending organizations in the region (eg Asian Development Bank). The Development Finance may be made available to the private sector on commercial terms to facilitate the utilization of nuclear technologies. It was *agreed* to invite Japan, New Zealand, Korea, Singapore, Indonesia, India, China and the Philippines to consider this proposal further and to submit views to the RCA Co-ordinator for consideration at the General Conference Meeting.

15. Other Business

It was agreed that a letter should be sent to the Myanmar Minister for Science and Technology expressing the appreciation of all delegates at the 19th Working Group Meeting for the excellent arrangements made for the meeting and to wish Myanmar every success in the future development of its nuclear science and technology programmes within the framework of the growing importance being placed by the Government of Myanmar on science and technology to assist its national development priorities.

New Zealand issued an invitation for the 20th RCA Working Group Meeting to be held in Wellington in 1998. At this stage, the invitation was provisional and would be confirmed by June 1997. India and Pakistan were proposed as alternative venues.

CLOSING SESSION

16. Adoption of the Draft Report of the 19th Working Group Meeting

A draft report of the meeting was circulated and comments provided by delegates. Mr Rolland (Australia) undertook to collate a final draft report taking account of the comments made.

17. Closing Remarks

Dr Tin Hlaing and Mr El Saiedi presented their concluding remarks on behalf of the Myanmar authorities and the IAEA respectively. Dr Tin Hlaing thanked the Agency, particularly Mr Cherif, Mr El-Saiedi and the RCA Co-ordinator, and all present for their support. Mr El Saiedi expressed the Agency's appreciation to the Government of Myanmar for their excellent arrangements for the meeting, to the various chairpersons and rapporteurs, and to all participants for their positive contributions which had ensured the success of the meeting.

LIST OF ANNEXES

LIST OF DELEGATES TO THE 19TH RCA WORKING GROUP MEETING AND SECRETARIAT.

Country	Participants	Designation
Australia	Mr. John Rolland	(RCA National Co-ordinator) Director, Government and Public Affairs Division ANSTO
Bangladesh	Dr. Wazed Miah	(RCA National Co-ordinator) Member, Physical Sciences, BARC
China	Mr. Zhu Jiang	(RCA National Co-ordinator) Senior Engineer, Div. of International Organizations, Office of IAEA Affairs, CAEA
	Mr. Zhang Jing	Senior Engineer Office of IAEA Affairs, China Atomic Energy Authority
India	Dr. S. Gangadharan	(RCA & UNDP National Co-ordinator) Chief Executive, Board of Radiation and Isotope Technology (BRIT)
Indonesia	Professor A. Djaloeis	(RCA National Co-ordinator) Deputy Director General National Atomic Energy Agency
	Dr. Widjang H. Sisworo	(Director of Programme Development Bureau) BATAN Jakarta

Japan	Dr. Sadayoshi Kobayashi	Safety Analysis Unit National Institute of Radiological Sciences (NIRS)
	Mr. Koji Saeki	Deputy Director Research and International Affairs Div. Science and Technology Agency Atomic Energy Bureau (STA)
	Dr. Makuuchi	General Manager Radiation Processing Development Laboratory TRCRE-JAERI
	Dr. Tamikazu Kume	Principal Scientist Resources Utilization Technology Laboratory Takasaki Radiation Chemistry Research Establishment (JAERI)
Republic of Korea	Dr. Sung-Kwang Yang	Deputy Director Atomic Energy International Co-operation Division Ministry of Science and Technology
	Dr. Hong-Young-Don	Head Office of International Co-operation (KAERI)
	Mr. Cho Kunwoo	International Co-operation of Division Korea Institute of Nuclear Safety (KINS)

Malaysia	Dr. Ahmad Sobri Hj. Hashim Dr. Nahrul Khair Alang Md. Rashid	(RCA National Co-ordinator) Director General Malaysian Institute for Nuclear Technology Research (MINT) (UNDP National Counterpart) Deputy Director General Malaysian Institute for Nuclear Technology Research (MINT)
Mongolia	Dr. Ganzorig	Executive Secretary Nuclear Energy Commission Mongolia
Myanmar	list attached	
New Zealand	Dr. Peter Roberts Dr. G. Wallace	(RCA National Co-ordinator) Manager, Industrial and Biological Nuclear Sciences Group Institute of Geological and Nuclear Sciences (IGNS) Senior Scientist, Institute of Geological and Nuclear Sciences (IGNS)
Pakistan	-	-
Philippines	Mr. Carlito Aleta	(RCA National Co-ordinator) Director Philippines Nuclear Research Institute (PNRI)
Singapore	Mr. Chua Yew Peng Assoc Prof. Aziz Nather	Chief Engineer International Environment and Policy Department Ministry of the Environment Head, Division of Spinal Surgery Department of Orthopaedic Surgery National University Hospital
Sri Lanka	Mr. J.M.A.C. Yayasinghe,	Scientific Secretary Sri Lanka Atomic Energy Authority

Thailand	Mr. Manit Sonsuk	Senior Nuclear Chemist Office of Atomic Energy for Peace (OAEP)
Viet Nam	Dr. Bui Van Hung Professor Hien	Director, Department of International Relations and Planning (VINATOM) Vietnam Atomic Energy Commission (VINATOM)
IAEA	Mr. Kazuaki Yanagisawa Mr. H.S. Cherif Mr. A. El-Saiedi Mr. Hans-Friedrich Meyer	RCA Coordinator (IAEA) Special Assistant to DG, (IAEA) DIR-TCIM (IAEA) IAEA Officer

Country	Participants	Designation
Myanmar	1. Dr. Tin Hlaing	- RCA National Co-ordinator, Secretary, Myanmar Atomic Energy Committee
	2. Dr. Sein Htoon	- Professor, Physics Dept, Yangon University
	3. U Sein Htay	- RCA Co-ordinator for Nuclear Instruments Maintenance, Principal Scientist, Myanmar Scientific and Technological Research Department
	4. Dr. Myo Khin	- RCA Co-ordinator for Diagnosis of Hepatitis by Radioimmunoassay, Principal Scientist, Department of Medical Research
	5. Dr. Daw Win Mar	- RCA Co-ordinator for Strengthening of Nuclear Medicine, Head, Yangon General Hospital
	6. U Win Aung	- RCA Co-ordinator for Food Acceptance and Trade in Irradiated Food, Director, Myanmar Scientific and Technological Research Department
	7. U Soe Myint	- RCA Co-ordinator for Nuclear Power Planning, Director General, Department of Energy Planning
	8. Dr. Khin Maung Han	- RCA Co-ordinator for Radiation Sterilization of Tissue Grafts Consultant Orthopaedic Surgeon, Yangon General Hospital
	9. U Kyee Myint	- RCA Co-ordinator for Tracers and Nucleonic Control Systems, Professor, Physics Department, Mandalay University
	10. U Aung Gyi	- RCA Co-ordinator for Non-Destructive Testing, Senior Scientists, Myanmar Scientific and Technological Research Department
	11. U Wai Zin Oo	- RCA Co-ordinator for Radiation Technology Principal Scientist, Myanmar Scientific and Technological Research Department
	12. U Tin Maung Kyi	- RCA Co-ordinator for Nuclear Analytical Techniques, Principal Scientists, Myanmar Scientific and Technological Research Department
	13. U Hla Win	- RCA Co-ordinator for Nuclear Information Systems, Principal Scientist, Myanmar Scientific and Technological Research Department
	14. U Than Hla	- RCA Co-ordinator for Supplementation Strategies and Animal Production, Deputy Director, Livestock Breeding and Veterinary Department
	15. Dr. Myint Khine	- UNDP Co-ordinator, Deputy Director, Myanmar Scientific and Technological Research Department

Inaugural Address by
H.E. U THAUNG, Minister of Science and Technology
at the 19th RCA Working Group Meeting

Excellencies, distinguished Delegates, Ladies and Gentlemen,

It is my great pleasure to welcome you here for the 19th Working Group Meeting of RCA Member States. It is indeed a great honour for Myanmar as well to host this meeting. It was the Beijing-meeting last year, which came up with the resolution that Myanmar be given priority of hosting this year's meeting and we highly appreciate its thoughtfulness. Truly, it is delightful to see the disclosure of the desire of our partners to allow us with this opportunity to participate in RCA activities.

We are aware that the Regional Co-operative Agreement for Research, Development and Training related to Nuclear Science and Technology is now 25 year old. The rare convergence of this meeting and the Silver Jubilee of RCA cannot afford to be slipped by without being noted. It is my understanding that all the Member States will be celebrating this happy event of the Silver Jubilee. I must say that we are fortunate to be privileged with this golden opportunity of having the celebration here, this evening, as the first to start all the celebrations.

The RCA represents a fine example of intergovernmental interregional cooperation. It is a known fact that in today's sophisticated world order, nuclear science and technology is veritably in great demand. The Asia and Pacific region of our Member States is a very large region with a very large population. Albeit social, cultural and economic diversity in the region, you will only experience "Unity in Diversity" in its framework, where these nations are but a tightly knitted fabric in their dedication to co-operation in the field of nuclear science and technology. As a result of which, both developed and developing nations enjoy equality of benefits by participation and co-operation in RCA. Although Myanmar was born only in the year 1994 with its membership, we were able to improve our nuclear science projects, along with the commencement of new ones. Applications cover health, agriculture, animal-health, environment and industry, where the Member States share, not only the aspect of technicality, and skill, but material and human resources as well. This meeting, I believe, will go far and beyond, with a good coverage of future programming, making RCA's record even better.

I also learnt that this good record is made possible by the participation and support of IAEA and UNDP. On this pleasant occasion, let me take this opportunity, to express my sincere thanks to IAEA and UNDP for their kind support. I would also like to thank the governments of Member States, and the secretariat, for all previous achievements, encompassing their strong dedication, commitment and conviction in future co-operation.

Finally I would like to conclude by saying to the distinguished delegates, that as your arrival here coincides with our "Visit Myanmar Year", the whole of Myanmar, welcomes you. Again, in my name, I wish you a happy time in Yangon - please enjoy your stay.

Thank you all very much.

19th RCA Working Group Meeting
Welcome Address by U AUNG KOE
Deputy Chairman, Myanma Atomic Energy Committee

Distinguished delegates of RCA Member States,
Ladies and Gentlemen,

It gives me great pleasure to get this opportunity to speak at this inaugural session of the 19th Asian Pacific RCA Working Group Meeting. I feel it a great honour for me to warmly welcome the RCA delegates on behalf of MAEC and on behalf of the Organizing Committee for convening this meeting. I have noticed that all seventeen Member States of RCA are represented at this meeting. As hosts, we are very pleased that the participation is 100 percent. I think this is an evident sign of unity and cooperation and also serious interest of the Member States in the RCA activities.

Now I would like to take a few minutes to talk about this meeting coming to Myanmar. About this time last year, Myanmar was offered the chance to host the 18th meeting. But we were unable to accept it. The RCA secretariat was in a tight situation to hold the meeting before the third week of May. At the time, we were holding the first Myanmar Industrial Exhibition. The time of the meeting coincided with it. So, the RCA meeting went to Beijing. It must have been a very difficult task for the Chinese to arrange it at very short notice. Yet they managed to do it. I congratulate our Chinese friends for that success.

Myanmar was unable to send a delegate to the 18th Working Group Meeting. But, in spite of our absence, the Beijing meeting agreed to invite Myanmar to be the host for the next annual meeting. Myanmar was given priority as the venue of the meeting. When this decision was made known to us, we were very pleased. The MAEC accepted the offer and we confirmed our acceptance at the General Conference Meeting of the RCA last September.

Since that time, we have been in constant contact with Mr Yanagisawa, the RCA-Co-ordinator, to prepare for the meeting. He was full of understanding and very keen to make this meeting a success. He did his best to give us any assistance we needed. In fact, all sections and departments of the IAEA responded to any requests we made.

Now, let me talk about the significance of this meeting. This is the first major RCA event marking the Silver Jubilee of the RCA. The RCA is now 25 years old. This evening we plan to celebrate the RCA Silver Jubilee. Although we joined

RCA only in 1994, we are now the first nation to celebrate its Silver Jubilee. This is possible for us because of the understanding of our RCA partners.

May I now use this opportunity to present to this meeting a brief history of Myanmar's attempts to promote nuclear technology applications. Back in the fifties we started with very ambitious nuclear programmes. There was the UBAEC or Union of Burma Atomic Energy Commission. which existed as apart of Union of Burma Applied Research Institute. There were initiatives and investments in terms of manpower. Myanmar was also a member of IAEA since 1957. However, most of our plans have not materialised. We found that our achievements have not been great.

However, after 1988, during the time of State Law and Order Restoration Council, our economy opened up. Developments in other countries, particularly the RCA-Member States have come to our attention. At the same time, we are finding that industrial applications of nuclear techniques are growing.

I can give you one example. Towards the end of 1996 we found that the oil and gas industry is using NDT methods and radiation gauges. The MAEC has been approached to supply technicians for assistance. Of course the scale is not very large yet. But we think this is a good beginning.

In other areas too, we are starting to make our efforts. For example, we are planning improvement and extension of nuclear technology applications for health, agriculture and animal husbandry.

Our participation in the RCA is certainly beneficial for us. For instance, we are now able to receive and upgrade the tissue bank project. During last year we were able to start demonstrations of tracer technology applications and have our people trained in these areas. These were made possible by RCA assistance.

Myanmar is mainly an agricultural country. We feel that we can improve a lot by using nuclear methods in agriculture and water resources.

Applications such as radiation technology are certainly appropriate for Myanmar. Let us take food irradiation for example. We cannot use this technology yet. With our economic potential we believe radiation processing shows great prospects.

At the present state, we have very limited resources and manpower. We have only few hard core scientists and technicians in different areas.

But we are not discouraged. One reason for our optimism is the commitment of our leaders to support our attempts to introduce and promote nuclear technology. Let me highlight some very encouraging signs.

We now have a Ministry of Science and Technology. It was created on 2nd October 1996. So it is only five months old, but it is expected to grow rapidly. This new Ministry will be responsible for all atomic energy matters in the country.

Also, there is all out effort to produce an Atomic Energy Law, i.e. a law to promote atomic energy and to lay down regulations for radiation protection. This law is now in final form, under review by the Attorney General's Office.

The second reason for us to have expectations from nuclear technology is our involvement in RCA. We feel that technologically advanced partners in the RCA would assist us in our efforts. We really count on the RCA. From now on we will try to fully participate in RCA activities and thereby develop our technological level.

Let me now conclude. As our Minister has said, the RCA is a really fine example of regional cooperation. I believe this meeting will discuss ways and means of even better cooperation. I also trust that the meeting will come out with plans for future activities which will promote nuclear science and technology in the cause of development and well being of the people. I wish this meeting great success.

Finally, I urge our guests to feel at home, to enjoy your stay here and I ask you, please don't hesitate to worry us with any of your needs.

Thank you all very much.

Opening Address
19th RCA Working Group Meeting
DR ALI F. EL-SAIEDI,
Director, Division of Technical Co-operation Implementation,
Department of Technical Co-operation, IAEA
10 March 1997

Excellency, Distinguished Colleagues and RCA National Coordinators, ladies and gentlemen.

On behalf of the Director General, Dr. Hans Blix, it gives me great pleasure to welcome you to the Nineteenth Working Group Meeting of RCA Member States.

The IAEA presents its compliments to the Government of Myanmar and expresses its appreciation for agreeing to host this important annual event which coincides with the celebration of the 25th anniversary of the establishment of the RCA.

Mr Qian, DDG and Head of the Technical Co-operation Department asked me to convey his greetings to you and his wishes for a successful meeting. He was keen to join you in this meeting, but his commitments prevented him from doing so. It is a privilege to have Dr Cherif, Special Assistant to the Director General, participate in this important event. Dr. Cherif also attended last year's meeting in Beijing. This shows the importance the IAEA attaches to this event and the issues to be discussed here.

The past year saw the realization of the RCA programme of activities, as established by you. It also witnessed several meetings addressing policy and management issues that reflect the natural evolution and progress towards a mature and fully effective programme.

As to the programme activities, there were 24 Technical Co-operation on-going projects dealing with areas covering Industry and Environmental Applications, Medical and Biological Applications, Agriculture, Radiation Protection, Research Reactors and Energy-Based Projects. Twenty-four major events and meetings were held during the year, involving 172 participants. A total of 19 training events were carried out under the RCA which gave training opportunities to 358 participants. Finally, 76 expert assignments were implemented at the request of Member States.

Excellencies,

In 1996, the joint UNDP/RCA/IAEA Project on Isotopes and Radiation to Strengthen Environmentally Sustainable Development was terminated. It has helped to introduce technologies in the fields of Tracers and Nucleonic Control Systems, Non-destructive Evaluation, Radiation Technology and Nuclear Analytical Techniques to Member States and helped with promoting the peaceful uses of nuclear techniques in industry and the environment. Building on the experiences of this Project, RCA Member States have worked together to formulate a new UNDP project which focuses on new areas of concern: Environmental Pollution, Coastal Areas, Women in Development and Health-related areas. There is great confidence that this project would be approved by UNDP and that it will start by mid-1997.

The year 1996 also witnessed two important meetings in addition to the regular Working Group Meeting in the People's Republic of China and the General Conference Meeting in Vienna. Those two additional meetings dealt with policy and management issues. One meeting was dedicated to study the management structure of the RCA programme for the purpose of reinforcing the ownership by RCA Member States while keeping the fundamental link with the Agency. The other meeting was a joint meeting of representatives of the three Regional Co-operation Agreements, RCA, ARCAL and AFRA and the Agency, to identify ways and means to enhance co-operation between the three regions within the framework of Technical Co-operation between Developing Countries (TCDC).

This year however, we all should be looking forward to an even more active year;
- With the management issues cleared and formulated;
- With the Joint UNDP/RCA/IAEA Project terminated and the New Joint Project in its final approval stage;
- With the enthusiasm in Member States and your dedication to keep the RCA strong and effective;
- And finally with the Agency's TC strategy emphasizing support to Regional Agreements as a stimulant to TCDC.

I am confident 1997 will see more of your efforts in strengthening the efficiency and effectiveness of the RCA activities - an objective that can be practically achieved through employing the available nuclear capacities you have built throughout the years for productive and sustainable human development.

Mr. Chairman, Distinguished RCA National Co-ordinators,

The Agency has, so far, been a major financial contributor to the RCA co-operative activities in addition to its roles stipulated in the RCA Agreement. It will continue to fulfill its commitment as a financial supporters as long as your requests for contribution fall within the New Strategy for Technical Co-operation. Here allow me to highlight the main elements of this New Strategy which undoubtedly will meet your full understanding and appreciation.

During the last few years the scope and substance of the Agency's Technical Co-operation Programme has taken a gradual shift from activities aimed at capacity building to employing it for productive and sustainable development activities. Thus, the New Strategy for the coming years has been set to assure that *"All technical co-operation with Member States shall promote tangible socio-economic impact by directly contributing in a cost-effective manner to the achievement of the major development priorities of each country"*. In other words, the Agency shall become a partner with each Member State or group of Member States, co-operating in the process of achieving sustainable development.

Three principal modalities are applied to achieve this strategic goal:

First: Extending the Model Project principles to the entire TC programme. This involves a strengthened problem-solving or end-result approach, detailed work plans and objective performance indicators. Continued help to build scientific and technological capabilities will be tied up to meeting identified developmental objectives.

Second: The Country Programme Framework will become the key programme planning method in Technical Co-operation. It is to identify priority areas of application of nuclear technologies that are in line with the country's needs and plans.

Third: Thematic Planning, which involves the assessment and promotion of nuclear applications that have demonstrated significant benefit to Member States, will become one of the main forces for re-orienting TC activities.

The three modalities set standards of high quality in project design and formulation which is becoming a pre-requisite for financial support from the Technical Co-operation Fund.

In addition to these three principal modalities pre-stated, there are several auxiliary concepts and activities that need to be emphasized in pursuing the Strategic Goal. Most critical are:

First: TCDC, with the Regional Co-operation Agreements as most successful mechanisms to stimulate this kind of co-operation. The RCA region, if I may say, is in a unique position of incorporating countries at all stages of development and encompassing more than half of the world population.

Second: It is important to broaden the base of partnership and stimulate productive interactions amongst end-users, regional planning bodies, international assistance organizations, non-governmental organizations, as well as the private commercial sector, where appropriate.

Accordingly, should RCA seek funding for TC projects, this will require extensive upstream work on project design and formulation to bring it to acceptable standards compatible with this New Strategy. This I am quite sure, you can provide with the capacities and experiences available in the region. Such assets should be employed in addressing high-priority and challenging needs in Member States of the RCA.

Let me take this opportunity, Mr. Chairman to reiterate that ownership of co-operative activities depends on the extent of cost-sharing between the parties involved.

Thus, it would be good to see that additional donors from RCA Member States would support RCA projects and thus enhance their responsibilities as prime shareholders. Last year, the Agency contributed nearly 50% of RCA projects funds, while Member States paid nearly 25% and UNDP the remaining 25%. It is hoped that Member States' contributions would gradually increase to a level equaling, if not exceeding the external donation. This should certainly be given serious consideration in your deliberations.

Finally, Mr. Chairman, you have a full agenda in front of you for the next four days:

- the Project Committee's reviews of the five technical areas;
- the sessions on policy and managerial issues,
- discussions on future activities and projects.

The results of your meetings will give guidance to the Agency to best serve you in your endeavours.

In conclusion, Dr Cherif and myself look forward to learning of your views on how, together, the Agency and RCA Member States can best achieve the mutual objective of keeping RCA strong and effective.

I thank you for your attention and wish you a successful meeting.

Thank you.

Curriculum Vitae of Dr. Tin Hlaing (RCA National Co-ordinator, Myanmar)

Dr. Tin Hlaing was born in Ayadaw Township in Central Myanmar. After his early education in the village Buddhist Monastery, he had his formal western education in Mandalay. He graduated from Mandalay University with a Physics degree. He had his postgraduate education in the University of Yangon and later in London University.

He received a Ph.D. degree in Physics in 1977 from London University.

Since his graduation Dr. Tin Hlaing joined the University teaching career. He taught in the Universities of Yangon, Mawlamyine and Mandalay.

In 1995, Dr. Tin Hlaing joined the Myanma Scientific and Technological Research Department in Yangon where he is now the Director of Atomic Energy and Physics and Engineering Departments. Since January 1996, Dr. Tin Hlaing has also become the Secretary of Myanma Atomic Energy Committee. He is also the RCA National Co-ordinator.

Dr. Tin Hlaing has wide interests in science and technology. His serious research involvement was nuclear spectroscopy and position annihilation studies. Later, during his university career he became interested in energy and related matters and chaos theory.

DRAFT AGENDA
FOR
19TH RCA WORKING GROUP MEETING, YANGON, MYANMAR,
10-14 MARCH 1997

<u>Monday, 10 March</u>

AM

08:30-09:30	Registration
09:30-10:00	*Inaugural Session*
	(1) Inaugural Address by Minister of Science and Technology
	(2) Welcome Address by the Chairman of the Organizing Committee of the 19th Working Group Meeting
	(3) Welcome Address by Representative of IAEA
10:00-10:30	Coffee Break
10:30-12:00	*1st Administrative Session*
	(4) Election of Chairperson for the 19th WGM
	(5) Adoption of Agenda
	<u>*Election of the Chairpersons for Project Committees*</u>
	(6) Presentation of RCA Draft Annual Report, 1996
	(7) Submission of Country Statements
12:00-14:00	Lunch

PM

14:10-14:20 (8a) AGRICULTURE

Close
*RAS/5/032: " Training Course on Molecular Approaches, Mutations and Biotechnology''

Carry Over
*RAS/0/022 : " Public Acceptance and Trade in Irradiated Foods''

New
None

**New Project Proposals

14:20-16:00 (8b) INDUSTRY & ENVIRONMENT

Close
*RAS/5/021: " Increasing the Capability of Common Grain Legumes "

*RAS/8/064: " Radiation and Isotope Application in Industry"

*RAS/8/065: " Marine Contamination and Sediment Transport"

*RAS/8/068: " Isotopes and Radiation in Industry and the Environment " (RAS/8/076)

* RAS/8/073: " Measurement of Marine Contamination and Transport " (RAS/8/076)

*RAS/92/073(RAS/8/069/, RAS/8/070, RAS/8/071):
" Isotopes and Radiation in Industry and the Environment"

1) Draft Terminal Report by Prof. P. Hien

2) Present Status of New Joint UNDP/RCA/IAEA Project by RCA Co-ordinator

New
*RAS/8/076: " Better Management of Environmental and Industrial Growth "
New Joint UNDP/RCA/IAEA Project

*RAS/8/077: " Thematic Programme on Advanced Techniques for Industry "

*RAS/8/078: " Nucleonic Control System and Tracers in Industry"

**New Project Proposals

16:00-17:30 ***RCA-25th Anniversary Celebration***
(i) Address by Chairman of RCA Working Group Meeting
(ii) Greetings on Behalf of Agency
(iii) RCA Biography and Activities by Senior/Most National Co-ordinator
(iv) Ceremonial Opening of Exhibition (30min.)

Evening RCA Silver Jubilee Dinner

<u>Tuesday, 11 March</u>
AM
08:30-09:45 (8c) ENERGY

Close
*RAS/0/013: " Energy and Nuclear Power Planning "

*RAS/4/011: " Research Reactor Utilization "

*RAS/9/016: " Training Course on Regulatory Control of NPP "

Carry Over
*RAS/0/021: " Nuclear Power Planning "

*RAS/0/023: " Energy, Electricity and Nuclear Power Planning "

New
None

**New Project Proposals

09:45-10:00 Coffee Break

10:00-12:00 (8d) HUMAN HEALTH

Close
*RAS/4/008: " Nuclear Instrument Maintenance " (To be subproject of RAS/6/028)

*RAS/6/016: " Use of Computers in Tc-99m Imaging "

*RAS/6/018: " Radioimmunoassay for Hepatitis B Diagnosis " (To be subproject of RAS/6/028)**(Ref. T-8d-2)**

*RAS/6/025: " Training Course on Quality Assurance in Radiation Therapy Dosimetry "

Carry Over
*RAS/6/022: " Strengthening Nuclear Medicine in RCA Member States" (RAS/6/029)

*RAS/7/003: " Radiation Sterilization of Tissue Grafts " (RAS/7/008)

New
*RAS/6/027: " Quality Assurance in Radiation Therapy "

*RAS/6/028: " Thematic Programme on Health Care "
RAS/4/008, RAS/6/018,
Subproject/ Enhancement Production & QC of Radioisotopes & Radiopharmaceuticals

--------CRP--

Close
*CRP/E1.30.06(LIVER, Japan), " Evaluation of Imagine Procedure for the Diagnosis of Liver Diseases "

*CRP/E3.30.08 CANCER, Japan), " Computer Assisted Planning and Dosimetry in Radiotherapy of Carcinoma of Cervix in the Asian and Pacific Region"

Carry Over
*CRP/E1.20.14(THYROID, Japan), " Evaluation of Radioactive Iodine Therapy for Hyperthyroidism"

New
None

**New Project Proposals

12:00-14:00 Lunch

PM
14:00-14:30 (8e) RADIATION PROTECTION

Close
None

Carry Over
*RAS/9/006: " Strengthening Radiation Protection Infrastructure " (RAS/9/018)

New
*RAS/4/016: " Preparation for Disposal of LILW from Non-power Sources "

**New Project Proposals

14:30- (8f) TCDC

Carry Over
*RAS/0/015: " Development of TCDC in Asia and the Pacific "
TCDC in RCA Activities by Prof. A. Djaloeis

Close
*RAS/0/019: "Nuclear Information System " (RAS/8/076)
RCA Home Page

New
*RAS/0/024: " Project Formulation Meetings"

**New Project Proposals

Wednesday, 12 March
AM

2nd Administrative Session

09:00-10:30 (9) RCA Management(*Mr. J. Rolland, IAEA, Open Discussion*)

10:30-10:50 Coffee Break

10:50-11:00 (10) RCA Extension

11:00-12:00 Lunch

PM

(11) Technical Tour (I)

Thursday, 13 March
AM

09:00-09:30 (12) 25th Anniversary (*Proposal by Japan*)

09:30-10:00 (13) Overview of the RCA Projects for 1997(*RCA Co-ordinator*)

(14) RCA in next 25 years

10:00-10:20 Coffee Break

10:20-11:30 (15) Proposal for RCA Projects to be Funded by Agency Covering the Period 1999-2000

11:30-12:30 Lunch

(16) Other Business

PM

12:30-16:30 (17) Technical Tour (II)

16:30-17:30 (18) Review of the Draft Report

<u>Friday, 14 March</u>

AM

09:00- *Closing Session*

(19) Adoption of the Draft Report of the 19th Working Group Meeting

(20) Closing Remarks

a) IAEA (Dr. A. El-Saiedi)

b) Myanmar Atomic Energy Committee (Dr. T. Hlaing)

(21) Official Closing

LIST OF CHAIRPERSONS

Name	Position	Session
U Than Hla	Dep Director, Ministry of Livestock and Fisheries	Agriculture
Prof Dr Sein Htoon	Head of Dept of Physics, Yangon University	Industry and Environment
U Soe Myint	Dir Gen, Energy Planning Dept, Ministry of Energy	Energy
Dr Daw Win Mar	Head, Nuclear Medicine, Ministry of Health	Human Health
Prof U Kyee Myint	Head of Physics Dept, Mandalay University	Radiation Protection
Dr Myint Khine	Director, (MSTRD), Ministry of Science and Technology	TCDC
Dr Tin Hlaing	Director (MSTRD), Ministry of Science and Technology	Admin Session

LIST OF RAPPORTEURS

Name	Position	Session
U May Aung	Asst Gen Manager, Ministry of Agriculture	Agriculture
Dr Tin Win	Lecturer in Physics, Yangon University	Industry & Environment
Dr Pho Kaung	Asst Lecturer in Physics, Yangon University	Industry & Environment
Dr Khin Swe Myint	Lecturer in Physics, Mandalay University	Energy
Dr Myo Khin	Principal Scientist, Ministry of Health	Human Health
U Thant Zin Naing	Asst Lecturer in Physics, Yangon University	Radiation Protection
Daw War Myo Aung	Scientist, Ministry of Science and Technology	Radiation Protection
Dr Ko Kyaw Soe	Asst Lecturer in Physics, Yangon University	TCDC
Dr Khin Maung Than	Lecturer in Physics, Mandalay University	TCDC

- Daw ≡ Ms
- U ≡ Mr

LIST OF RAPPORTEURS (GENERAL FIELD)

Name	Position	Session
Daw Hla Hla Than	Asst Lecturer in Physics, Yangon University	Inaugural, Admin, Ind & Environ, Agriculture
Daw Khin Khin Win	Asst Lecturer in Physics, Yangon University	Inaugural, Admin, Ind & Environment
Daw Kay Thi Thin	Asst Lecturer in Physics, Yangon University	Inaugural, Admin, Ind & Environment
Daw Sanda Aye	Principal Scientist, Ministry of Science and Technology	Energy, Human Health, Radiation Protection
Daw Yi Yi Khin	Senior Scientist, Ministry of Science and Technology	Energy, Human Health, Radiation Protection
Daw Mi Cho Cho	Senior Scientist, Ministry of Science and Technology	Energy, Human Health, Radiation Protection

- Daw ≡ Ms
- U ≡ Mr

OTHER STAFF

Name	Position	Affiliation
Daw Myint Myint	Technical Staff	Science and Tech, MSTRD
Daw Aye Aye Than	Technical Staff	Science and Tech, MSTRD
Daw Mya Mya Win	Computer Staff	Science and Tech, MSTRD
Daw Me Ohnmar	Computer Staff	Science and Tech, ICST

- Daw ≡ Ms

ORGANIZING SUB-COMMITTEES

Name	Designation	Affiliation
Dr Tin Hlaing	Secretary, WGC	Director, Ministry of Science and Tech
Dr Myint Han	Chair, Exhibition	Deputy DG, Ministry of Science and Tech
Prof Dr San Tint	Chair, Reception	Head of Dept (Electronics), Ministry of Science and Technology
Prof Dr Sein Htoon	Chair, Secretariat	Head of Dept (Physics), Yangon Univ
Dr Myo Khin	Chair, Information	Principal Scientist, Ministry of Health

Country Statements

1. Australia
2. Bangladesh
3. China
4. India
5. Indonesia
6. Japan
7. Republic of Korea
8. Malaysia
9. Mongolia
10. Myanmar
11. New Zealand
12. Pakistan
13. Philippines
14. Singapore*
15. Sri Lanka
16. Thailand
17. Viet Nam

*not submitted

COUNTRY STATEMENT BY AUSTRALIA

NINETEENTH RCA WORKING GROUP MEETING

YANGON, MYANMAR, 10-14 MARCH 1997

The Australian delegation is most appreciative of the arrangements made by the Myanmar Government for the hosting of this 19th RCA Working Group Meeting in Yangon. This includes the excellent arrangements made to celebrate the Silver Anniversary of the RCA.

RCA Management

Australia is supportive of early steps being taken to proceed with the revision of the procedures and practices governing the management of the RCA. Much of the ground work for this has already been done. At the 26th RCA General Conference Meeting held in Vienna on 18th September 1996, there was in principle agreement to proceed with the changes to the RCA management as set out in the discussion paper, subject to final scrutiny and review by RCA Member States and the Agency. The helpful comments from a number of Member States and the Agency have now been considered. Australia believes there is now a firm consensus among both Member States and the Agency on the vast majority of issues and it is up to this Meeting to ensure that there is prompt follow up action to incorporate these formally as part of the new RCA procedures and practice. To assist in achieving this end, a Working Paper has been distributed, listing the agreed recommendations for endorsement by this Meeting and subsequent adoption at the General Conference Meeting in September. The very few outstanding issues are also listed together with proposals on how to proceed with their resolution.

Australia is mindful of the forthcoming renewal of the RCA Agreement in July. We believe that the support by this Meeting of the detailed recommendations relating to the management of the RCA, for final endorsement by the RCA General Conference Meeting, would be a most appropriate way of demonstrating how the RCA Programme is responding to the changing world, particularly in our Region, and how it is adaptive and responsive to the needs of all parties involved. These actions will provide a sound basis for heralding in, on a very positive note, the next five year phase of the RCA, which also takes the RCA into the next millennium.

On the basis that the proposed changes are adopted by the RCA General Conference Meeting, this could be the last RCA Working Group Meeting in its present form. Future meetings held at this time would have the status of a Meeting of Representatives, to use the wording of the Agreement, and would be empowered to make decisions and as well as endorse recommendations from RCA technical or other meetings. There would be no further need to refer all decision making to the General Conference Meeting. Such a change will facilitate the process of orderly decision making, increasing markedly how the RCA can react to new challenges and the needs of Member States, and achieve prompt implementation. This and other reforms contained in the proposed recommendations will further increase the opportunities for all Member States to participate in the management of the programme.

In all the above deliberations it is essential to be mindful of the need to maintain and reinforce the transparent and democratic nature of the decision making process tradition within the RCA and avoid the creation of a management elite.

TCDC in the RCA Programme

In July 1996, there was a review of the achievements and the future prospects of TCDC activities within the three regional agreements. It would be fair to say that RCA took a lead role in these discussions and much of the substance for the detailed recommendations listed in the final report is to be found in the RCA paper entitled "TCDC in the RCA Programme - Current Status and Future prospects". Australia commends the outcomes of the final report to all RCA Member States.

Australian Funded Projects

Since 1993, Australia has provided A$1.5 million in extrabudgetary funds to support the project on "Applications of Isotope and Radiation Technology to Regional Development with Special Reference to Industry and Nuclear Medicine". This project has the objective of contributing to regional development through a combination of infrastructure development, personnel training, and equipment support through activities related to the industrial and medical applications of isotopes. The project has been specifically designed to meet IAEA and UNDP requirements and two components fall under the umbrella of the joint UNDP/RCA/IAEA project RAS/92/073. It is expected that the delayed implementation of some activities will mean that the project will not be fully completed until mid-year.

<u>Industrial Application of Isotopes and Radiation Technology</u>

This sub-project is providing technology transfer through a series of national seminars. Up until the end of 1995, national seminars had been conducted in the Republic of Korea, Pakistan, Viet Nam, Sri Lanka, Mongolia, Thailand, Myanmar and China. In 1996, a further two national seminars were given. Both were concerned with nuclear techniques in sedimentation and erosion studies and took place in Indonesia and Sri Lanka.

In March this year, the final two seminars will be conducted; one in Bangladesh on "Industrial Applications of Isotopes with Special Reference to Column Scanning" and the other in India on "Contaminant Migration in Deep Groundwater".

<u>Industrial Radiation Protection</u>

This sub-project is seeking to improve the knowledge and expertise of users of radioactive materials in industry and also to enhance the regulatory frameworks within RCA Member States for the control of radioactive materials. The project is developing and trialing training materials for technical personnel in distance learning format. Twelve of the twenty five planned modules have been submitted to the IAEA for review. Three modules have undergone scientific editing and a further three modules are awaiting in-house review. Workbooks for the completed modules are being prepared.

Draft material will be presented at the RCA Regional Workshop on Distance Learning Project in Radiation Protection which will be held in Sydney at ANSTO from 17 to 21 March at which representatives from all participating Member States are expected to attend. During the Workshop the participants will have an opportunity to review the materials prepared to date and comment on the coverage and content. Participants will assist in the planning of the programme for implementation of the final suite of modules as well as the avenues through which the materials may be trialed in Member States.

Australia would like to recall that training in radiation protection was included in the scope of the joint UNDP/RCA/IAEA project RAS/92/073 and the need for materials that will result from this particular project was acknowledged by the UNDP expert at the Tripartite Review Meeting in September 1994. The UNDP subsequently formally approved the incorporation of this distance learning component as part of the refinement of the joint project proposal, so that there would be a segment that would address their concerns about ensuring proper radiation protection support to industries utilising nuclear techniques. Australia considers it important to include details of this project in the terminal reporting for RAS/92/073 project. In the expansion of the utilisation of nuclear techniques, there is still the issue of public acceptance and public awareness and this continues to be a significant factor in the scope of future projects.

Nuclear Medicine

This sub-project seeks to encourage indigenous development of technologist training throughout the region by providing practical training materials which can be used for self-study or as a component of training courses. The project is attempting to ensure a common basic level of understanding and development of practical skills independent of the method of delivery. The pilot study is now in its final stages, with 13 students from India, Malaysia and Sri Lanka having reached the final stages. They have studied seven modules of learning over a 18 month period.

On-going student assessment has been carried out in the form of assignments, a mid-course workshop in each country and workbooks. These workbooks were completed by each student to record key points for each subject, the results from practical examinations and protocol development.

During November and December 1996, assessors from Australia spent two days in each department participating in the pilot study and conducting assessments on each student's understanding and practical skills. In April 1997, four students will undertake a final assessment test to further determine their understanding. The remaining students have successfully completed their tasks.

The course developers are making further refinements to the study materials to make them ready for final production an publication by the IAEA as a teaching series. When all students have been fully assessed, a final certificate of achievement will be issued through the IAEA indicating the student's successful completion of the programme.

Pakistan and Malaysia have incorporated some of the distance learning materials in their newly developed one year diploma courses. Bangladesh has several students who have been training using the distance learning materials since the start of 1996.

Other Australian Involvement in the RCA Programme

Australia was pleased to host two significant RCA events during 1996, namely:

- the Expert Advisory Group Meeting on Strengthening Radiation Protection Infrastructures (RAS/9/006) at ANSTO from 19-23 February 1996. This Meeting was attended by 12 experts from seven RCA Member States. It reviewed the IAEA/RCA Programmes in Radiation Protection for 1995 and 1996 and initiated the planning arrangements for the next phase of the RCA Programme.
- the National Co-ordinators' Meeting for the Radiation Sterilization of Tissue Grafts (RAS/7/003) in Brisbane from 30 September to 4 October 1996. The Meeting was attended by 17 National Co-ordinators and tissue bank representatives from 14 countries. There was also one representative from Peru. The Meeting had the task of analysing the achievements of the project, identifying any weaknesses, highlighting urgent needs and preparing a well-structured and focused work programme for the next two years.

Australia has continued to provide training and experts for a range of activities in the RCA Programme in the fields of research reactor utilisation, maintenance of nuclear instruments, radiation sterilisation of tissue grafts, radiation protection infrastructures, non-destructive evaluation, nuclear analytical techniques, tracer technology and nuclear information systems. Australia has also been an active partner in a number of Co-ordinated Research Programmes within the RCA Programme.

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The National RCA Co-ordinator, Mr John Rolland, participated in two significant RCA Meetings. One was the AFRA/ARCAL/RCA Tripartite meeting to Review the Achievements of TCDC Activities within the Regional Agreements which was held in Vienna 29 to 31 July 1996. The other was the Working Group Meeting to Review the Management Structure of the RCA Programme and Develop Proposals for the Future which was held in Vienna 11 to 13 September 1996.

Mr Brian Hutton, National Co-ordinator for the Nuclear Medicine Project RAS/6/022, took part in the Expert Advisory Group Meeting on the Formulation of Thematic Programme on Health Care held in Vienna from 4 to 8 November 1996.

The Joint UNDP/RCA/IAEA Project (RAS/92/073)

Australia welcomes the positive achievements which have been made within the Joint UNDP/RCA/IAEA Project. However, we consider that the RCA is understating one aspect of the achievements of the Joint Project. The assessment of the use of experts from developing countries has been accounted for on the basis of the number of missions, with no regard for the length of time involved. This provides a misleading measure which is distorting the true picture. The vast majority of the long missions carried out in this project, as well as the positions of long term experts, have been filled by experts from developing countries but these have only been counted as individual events. Further, the use of developing country expertise has not been restricted to just the RCA region. There has also been specific technical expertise utilised from experts from other developing countries outside the region. To date, this does not seem to have been specifically identified and acknowledged in documents reviewing the project's implementation and progress. The effect of both of these omissions has meant that there has been an understatement of the efforts made to increase the use of developing country expertise for appropriate tasks in the project.

The New Joint UNDP/RCA/IAEA Project

Australia has been pleased to hear of the positive responses from UNDP on the project proposal entitled "Better Management of the Environment, Natural Resources and Industrial Growth through Isotope and Radiation Technology" and looks forward to the early agreement by the UNDP to provide financial support for this important project.

The way in which the design and formulation of this new joint project has proceeded with inputs and contributions from the Member States in the initial processes, which were then developed through a series of meetings to yield the final agreed final project document is a good illustration of the continuing way in which the strong RCA spirit of regional co-operation and collaboration focuses to achieve results. The five preparative meetings, supported by additional individual country missions, have produced a proposal that has full regional ownership, endorsement by the Member States and their commitment. To this end, we would be concerned if the basic structure and detail of the project document agreed by Member States is altered without reference to Member States. Australia believes that it is essential for the

Member States to be informed and involved in any significant changes to the project document.

Concluding Remarks

Australia welcomes the initiative of an increasing number of RCA Member States to provide direct financial support to RCA activities. This trend further underlines the growing maturity of the Region in the development of nuclear technology and expertise. In terms of financial support from international organizations other than the IAEA, the support provided for some years to RCA activities by the UNDP has been invaluable. Australia however urges that urgent initiatives be taken to broaden the financial support base of the RCA.

Australia is supportive of the moves being made to transfer more of the operational management of the RCA programme into the hands of the Member States and is appreciative of the strong efforts of the Department of Technical Co-operation to stimulate and facilitate change. With changing roles occurring and with new tasks being taken on, it is important to strive to have as seamless a transition as possible. In this change process, it is particularly important to keep all avenues of contact open.

Australia believes that the selection of suitable people to fill the position of National RCA Co-ordinator has been a critical factor in the successful functioning of the Programme and it is the willingness of the Member States' Governments to release their senior personnel to carry out the important duties required for these positions, which has contributed greatly to the overall success and continued record of achievement. The release of these senior personnel is not without its cost at the national level and it is emphasised that people of this standing cannot be spared for full-time involvement solely on RCA matters. Australia therefore requests that any long term plan concerned with the management of the RCA Programme should take account of this.

Australia has been a strong supporter of the RCA programme for many years and has been pleased to make available its expertise, facilities, technology and extrabudgetary funds to support agreed projects. Australia looks forward to continuing to play an active role in the RCA as it moves ahead in providing an effective means for the benefits of the peaceful applications of nuclear science and technology to be made available to our Region.

19TH RCA WORKING GROUP MEETING
YANGON, MYANMAR
10-14 MARCH, 1997

COUNTRY STATEMENT : BANGLADESH

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19TH RCA WORKING GROUP MEETING
YANGON , MYANMAR, 10 - 14 MARCH, 1997
COUNTRY STATEMENT: PEOPLE'S REPUBLIC OF BANGLADESH

1. INTRODUCTION

Bangladesh, like other countries of the RCA has accrued benefit from this Institution through sharing of regional resources, facilities, equipment and expertise as well as pooling of knowledge. Bangladesh has been actively participating in almost the entire range of RCA activities since its inception . Such association has helped us use results of identified R & D programmes in different sectors of our national economy. I, on behalf of our Government, therefore, wish to express deep gratitude to the IAEA, UNDP, donor countries, national research institutes in RCA countries and all others who have contributed to the success of the objectives, programmes and activities of RCA. I would like to take this opportunity to express thanks to the Government of Myanmar for their generosity and the trouble taken to host this RCA Working Group Meeting and congratulate the RCA National Coordinators and other concerned officials.

Bangladesh Atomic Energy Commission (BAEC) is the focal point for RCA activities in Bangladesh. This organization has the responsibility to plan, coordinate and execute all R & D as well promotional activities related to various types of peaceful applications of nuclear science and technology. Long association with the RCA has facilitated not only building up and strengthening of the related infrastructure, but also linking the R & D programmes with the needs and priorities of development of various sectors of the national economy. Present activities encompass physics and chemistry programmes centered around a 3 MeV Van de Graff Accelerator and Research Reactor; design, development, repair and maintenance of nuclear and other electronic equipment and control systems; isotope application in health, industry and hydrology; prospecting and extraction of heavy minerals from beach sands as well as exploration of nuclear minerals; monitoring of radiation and radiation control; diagnostic and therapeutic services and investigations using nuclear and other state-of -the-art techniques; food preservation and medical product sterilization using gamma sources; radiation processing of different materials; indigenous production of certain types of radio-isotopes; tissue banking, etc.

Bangladesh continued to participate in various programmes of the RCA during the period under reference (January to June, 1996). Salient features as well as status of these activities are as follows:

2.1. Non-Destructive Testing (RAS/92/043)

Fabrication of mild steel NDT test pieces was initiated, which are to be used for training and certification purposes. R & D activities were continued in collaboration with the local universities. NDT services using radiographic, ultrasonographic, eddy current, magnetic particle and liquid dye penetrant testing methods were provided to local power stations, fertilizer factories, air crafts, sugar mills and paper mills. A part of the revenue thus generated was used for procuring NDT equipment and accessories.

NDT courses, originally planned for the year 1996, namely NDT of Concrete; Level-2 UT Course and Level-3 UT Course, could not be undertaken due to different reasons, including non-availability of expatriate resource personnel.

Bangladesh Society for NDT (BSNDT) became a Member of the International Committee for NDT (ICNDT) in 1996. Participation in this project has helped establish linkages with national industries and educational institutions as well regional contacts on NDT. The project has also helped develop a reasonably strong manpower with skill and proficiency in NDT.

The Project has helped establish linkages with various agencies of the country in the public and the private sector as well with similar institutions in the region.

BAEC officials attended the following regional activities in 1996:

a) "UNDP/IAEA/RCA Regional Training Workshop on Non-Destructive Testing Examination of Non-Metallic Materials", held in Singapore, 26-30 August, 1996.

b) " National Coordinators Meeting for Non-Destructive Evaluation", Mumbai, India 2-6 December, 1996.

2.2 Industrial Tracer Technology (ITT) and Nucleonic Control System (UNDP/RCA/IAEA Project: RAS/92/073)

A physical model (Closed Circuit Flow Rig) was installed in 1996. Several accessories required for setting up the physical model have been made by the local experts. The Physical Model was used for conducting six experiments, namely RTD analysis, Flow-rig measurements, Dead Volume measurements, Mixing Studies, Recirculation Studies and Parallel Flow Studies. A tracer laboratory with financial inputs of the Government was also set up during the period under review. Some supporting equipment (a counting equipment, Co-60 sealed source and Column Scanning programme) were received towards the end of the year. Further activities in this field is to be conducted under a separate TC project of the IAEA.

A demonstration on the Column Scanning Experiment arranged in association with the management of local Petroleum Refinery Installation, as well as a National Executive Seminar on Tracer Technology are scheduled to be held during 11-17 March, 1997.

Linkages with local agencies, namely, the Petroleum Refinery and the Environment Directory, where the know-how acquired from the RCA Project will be utilized on a collaborative basis. Personal contacts with RCA Coordinators of other countries have been helpful to this process.

Members of the Group participated in the following regional activities:

a) Expert group meeting on Routine Analysis of Radio Tracer Experimental Data and Physical Model, held in Korea in June, 1996; and

b) Seminar/Workshop on Nucleonic Control System, held in China in November, 1996.

2.3 Radiation Technology (RAS/92/073)

In 1996, some novel and important formulations were prepared with urethane acrylate oligmer combined with functional monomers in the presence of a very minute (0.1%) amount of organo-metallic complexes. Polymers and composites made by the application of these formulations under UV radiation have attained significantly high mechanical strength. These findings will be of much help to the implementation of the Pilot Plant that is under the active consideration of the government. A 200 kCi Gamma Source is envisaged for this Pilot Plant on Wood Plastic Composite (WPC). The project is expected to be completed soon and some Technical Assistance of IAEA has been sought for the project.

The project on the improvement on natural rubber latex is in a stage of further improving the tensile strength of rubber. Some additives have already been identified in this respect.

In the meeting of RCA Coordinators, Bangladesh showed its keen interest in the proposed RCA project on " Utilization of Agro-Waste by Radiation and Microbial Treatment for Use as Animal Feed and Fuel".

The project has facilitated development of human resources and a well-equipped laboratory. This infrastructure would be helpful in continuing the related R & D projects effectively. Linkages have been established with a local university, namely, the Shahjalal University as well as with a number of foreign institutions leading to colloborative research.

Members of the Group participated in the following regional activities:

a) RTC programme at Takashaki, Japan from 17 to 24 September, 1996; and

b) National Coordinators' Meeting at Takashaki, Japan from 11 to 16 December, 1996.

2.4 Nuclear Analytical Techniques (RAS/92/073)

Based on the expertise attained, the BAEC was selected as a member of the National Technical and Expert Committee on Arsenic contamination in ground water of the country and also the Chemistry Division of the Atomic Energy Centre, Dhaka was identified as the Reference Laboratory for arsenic measurements. Survey of Arsenic contamination in the ground water in the western region of Bangladesh was undertaken under this programme. The laboratory is involved in monitoring of Arsenic in hair using PIXE and XRF techniques. The laboratory has also been identified as the clinical laboratory for diagnosis of diseases by analyzing trace metals in urine, blood serum and other biological specimens.

BAEC continued to provide analytical services to different local organizations, both in the public and the private sectors by analyzing various parameters of industrial, agricultural, biological, clinical and environmental samples. During the period under review approximately 2000 parameters of nearly 500 samples were analyzed. The samples were sent by the private and public sector organizations, research and academic institutions and hospitals.

The related laboratories have successfully established and maintained close collaboration with local agencies, government departments and educational institutions. The project has helped strengthen the infrastructure through development of human resources and laboratory facilities.

Members of the Group participated in the following regional activities:

a) UNDP/RCA/IAEA Regional Training Workshop on Application of ISO-25 and other International QA/QC Standards in Laboratories Employing Nuclear and Complementary Techniques for Environmental Analysis, Taejon, Republic of Korea, June 24 - July 5, 1996.

b) International Symposium on Harmonization of Health Related Environmental Measurements using Nuclear and Isotopic Techniques, Hyderabad, India, 4-7 November, 1996.

2.5. Food and Irradiation Process Control and Acceptance (RAS/89/044)

The objective of the Project is to facilitate technology transfer of the process of food irradiation through proper evaluation of process control aspects, economic analysis and consumer acceptance. Under this programme, scaled up semi-commercial irradiation processing of prospective food items like onions, pulses and dried fish were carried out employing GMP and GIP (Good Irradiation Practice) in accordance with Codex Standards and Codes of Practices. Test marketing through traditional trading channels were undertaken and Consumers' Acceptance was assessed . A Joint Venture Company, Gammatech Ltd., was formed with a local entrepreneur and a multi-purpose Gamma Irradiator Plant has been established for irradiation of both food and non-food products.

The following activities were undertaken as a part of enhancing public acceptance of irradiated food:

a) A one-day National Seminar on "Irradiation as an Alternative to Pesticides for Food Preservation" was held, which was participated by a large number of government officials, dignitaries, representatives of the media and consumer interest groups.

b) Lectures on "Irradiation and Food Safety"' were delivered at the training courses of the Senior Medical officers of the Health Ministry, held at the Institute of Public Health, Dhaka.

Linkages with local entrepreneurs as well as various professional and interest groups have been established, which, among others, helped commercialization of the process and enhancement of public acceptance of irradiated foods. It has also been possible to establish close cooperation with scientists working in the field of food irradiation in different RCA countries.

2.6. RESEARCH REACTOR UTILIZATION (RAS/4/011)

During the last one year (1996) the following activities have been carried out under this programmes:

2.6.1 Neutron Scattering

R & D activities during the period 1996 included:

a) Investigation of crystallographic and magnetic structure of iron-aluminum alloy by neutron diffraction;

b) Study of multi-phase ceramic samples to determine various phase distributions;

c) Investigation of the effect of substitution in magnetic ordering in substituted Co-Ni ferrite samples;

d) Oxygen content in the $YBa_2Cu_3O_{7-\delta}$ superconducting materials ;

e) Study of Al-Mo-Ti alloy for determining the occupancy of different crystallographic sites by different ions; etc.

2.6.2 Neutron Activation Analysis (NAA)

Activities in 1996 included:

a) Participation in the IAEA's AQCS Intercomparison Study on the determination of toxic and other trace elements in IAEA -390 set of algae materials.

b) Participation in the IAEA's AQCS Intercomparison Study on the determination of trace elements in environmental samples of Baltic sea and New York Harbor.

c) Determination of mercury and selenium concentration through radiochemical separation technique followed by Instrumental Neutron Activation Analysis (INAA).

d) Low level (ppb) arsenic determination in water quality control analysis by INAA.

2.6.3 Radioisotope Production

Production of radioactive isotope ^{131}I has been continued and being supplied on a continuous basis to various Nuclear Medicine Centres as replacement for import. Construction of Glove Boxes for $^{99}Mo/^{99m}Tc$ generation system has been completed. The final installation of the generators was not possible due to the non-availability of installation engineer of the supplier.

Collaborative research programmes with universities were also pursued during the period under review.

2.7. MEDICAL AND BIOLOGICAL APPLICATIONS OF NUCLEAR TECHNIQUES

Medical and Biological applications of nuclear and radiation techniques are being widely appreciated in Bangladesh. At present, there are 9 fully operational Nuclear Medical Centres and one Institute of Nuclear Medicine in Bangladesh. Construction of 4 more nuclear medicine centres are expected to be fully operational by June 1997. Besides providing services, these NMC's and the INM carry out R&D work in some key areas. Bangladesh has also undertaken a selected number of projects for the biological application of nuclear and radiation techniques. Activities carried out during the reporting period (1996) under some important sub-projects in medical and biological fields are briefly described below:

2.7.1 RIA for Hepatitis B Diagnosis (RAS/6/018)

Five laboratories in Bangladesh are participating in this project designed for diagnosis of viral hepatitis through RIA mainly among three very vulnerable groups, namely, pregnant mothers, patients suffering from liver diseases and bloods donors. About 450 samples have been screened in 1996.

The project has helped establishment of new laboratories, development of skilled manpower and introduction of Radio Immunoassay in the field of major health problems like Hepatitis.

The Project is being concluded and a Meeting is scheduled to be held in Beijing, Peoples Republic of China from 3 to 7 March, 1997, which will be attended by the Project Coordinator. It is felt that the tenure of the project could be extended.

2.7.2 Strengthening of Nuclear Medicine (RAS/6/022)

Under this sub-project, BAEC has been conducting training of its different categories of nuclear medicine technicians. In 1996 one such training course was arranged, which was attended by 10 local participants.

2.7.3 Radiation Sterilization of Tissue Grafts (RAS/7/003)

The ultimate objective of the project is to facilitate establishment of a full-fledged Tissue Bank in the country to cater to the needs of various tissue grafts for surgical replacements. The work plan for 1996 included preparation, preservation and supply of radiation sterilized human tissue allografts. It has been possible to establish the technique for preparation of sterile amnion membrane grafts and bone grafts. These are now being supplied regularly to different hospitals for the treatment of burn wound, leprotic ulcer, bed sore and diabetic wounds as well as for the treatment of orthopeadic and dental patients. In 1996, sterilized tissues were used for treatment of 475 patients (50% burn wounds) .

Last year, various equipment were received under the Technical Assistance project of the IAEA. Some additional equipment were procured using funds allocated by the Government.

The project has helped establish linkages with various government agencies and local hospitals as well as with other institutions in different countries of the RCA.

2.7.4. Improvement of Grain-legume Rhizobium Symbiosis to Fix Atmospheric Nitrogen (RAS/5/021)

This project is being implemented by the Bangladesh Institute of Nuclear Agriculture of the Ministry of Agriculture. Host *Rhizobium* interactions were studied in lentils, chickpeas and soybeans using ^{15}N isotopic technique. There were three varieties of each of the crops tested against single and mixed culture inoculants. Experiments on chickpea, soybean and lentil were conducted at different places. Variations among the cultivators were recorded in all the crop species in regard to nodulation (number and mass), dry matter production and yield of the crops. Besides, demonstrations were established on five leguminous crops (viz. lentil, chickpea, cowpea, groundnut and soybean) at farmers' fields. Distinct beneficial effect of inoculants were observed in most of the demonstrations, indicating a great prospect of rhizobial biofertilizer technology in Bangladesh.

Training of 30 extension personnel on use of Rhizobial Biofertilizer was conducted and a documentary videofilm was developed on the performance of Rhizobial innoculents in farmers' fields. The project has helped generate interest among the farmers on use of the biofertilizer for improvement of legume yields. Private entrepreneurs are also showing interest in commercialization of the process. The Government has also approved the installation of a Pilot Plant.

It has been possible to establish linkages with various local government and private agencies, extension agencies, educational institutions as well as with institutions in RCA countries.

2.8. MAINTENANCE OF NUCLEAR INSTRUMENTS (RAS/4/008)

Association with this RCA project has helped development of human resources and building up confidence in regular repair and maintenance and also in upgradation tasks (Gamma Camera). Routine repair and maintenance of Nuclear and Medical Equipment, including maintenance of SPECT and Gamma Cameras, installation of Gamma Cameras, etc. were successfully undertaken throughout the period under review. In most cases, the indigenous capability was found to be adequate. Lack of spares or expertise hampered repair/maintenance only in 2/3 cases. Spare parts and components are being procured through internal resources as well as repair and maintenance work being continuously supervised and monitored by the Member, Physical Sciences, BAEC.

Postponement of training programme and non-availability of suitable experts in the field of repair, maintenance and upgradation (for example, the tenure of the expert's visit was inadequate) partially handicapped the activities under the project.

Bangladesh participated in the following Regional events:

a) Regional (RCA) Training Workshop on Upgradation of Analogue Gamma Camera with IBM PC's and relevant Software, Jakarta, Indonesia, October 7-25, 1996.

b) Inter-regional Training Course on Preventive Maintenance, Quality Control and Upgrading of Nuclear Medicine Instruments, Mumbai , India, November 4-9, 1996.

2.9. ENERGY AND NUCLEAR POWER PLANNING (RAS/0/013)

Under this RCA project, Bangladesh continued using WASP for conducting studies on least cost generation planning for Nuclear Power. Efforts were also made to rationalize and improve the input data in consultation with Electricity Authority (BPDB) of the country.

Bangladesh participated in the Regional Workshop on Infrastructural Requirements and Organizational Aspects of Nuclear Power Programme, held in Jakarta, Indonesia from 22 to 26 April, 1996. Information obtained from exchange of experience under different RCA activities are routinely utilized for planning purposes.

2.10. NUCLEAR INFORMATION SYSTEM (RAS/0/019)

The RCA Nuclear Information System Project (RAS/0/019) was undertaken as a component of INIS (International Nuclear Information System) to help scientific collaboration among the countries in the Asia and Pacific Region through development of a Network of Scientific Information (Data). Under this RCA programme, the activities in 1996 concentrated primarily on development of human resources, particularly in the utilization of hardware and software, dissemination of software services and development of the system in collaboration with the IAEA and other regional Counterparts.

The first workshop on Nuclear Information System under the RCA programme RAS/0/019 was held in Kualalumpur, Malaysia from 18-29 March 1996 and was attended by the Project Coordinator. The workshop dealt with different aspects of Nuclear Information Systems with emphasis on preparation of input for INIS database.

2.11 STRENGTHENING OF RADIATION PROTECTION INFRASTRUCTURE (RAS/9/006)

BAEC is responsible for developing and strengthening the radiation protection infrastructure in Bangladesh in order to be able to carry out the responsibilities given to it under the different provisions of the Nuclear Safety and Radiation Control (NSRC) Act No. 21 of 1993.

BAEC prepared the Draft Nuclear Safety and Radiation Protection Ordinance, which is now being examined by the Government. A Project Concept Paper on Waste Processing and Storage Facility (WPSF) has been prepared for consideration of the Government. In the field of implementation, the licensing and inspection activities were strengthened. The registry of radiation sources and users was updated.

BAEC is participating in the IAEA Model Project with the caption "Upgrading of Radiation Protection and Waste Management Infrastructure". An expert, Dr. B. Djermouni from the Division of Technical Cooperation of the IAEA, had visited Bangladesh and reviewed the work plan under the project. The Work Plan has been approved by the BAEC.

A National Training Course on Radiation Control was conducted from 17 to 29 August, 1996, which was attended by 29 participants including 3 female participants.

BAEC officials attended the following regional activity in 1996:

Regional (RCA) Training Course on Implementation of the IAEA Basic Safety Standards, held in India from 18 to 29 November, 1996.

3. CONCLUSION

Participation of Bangladesh in various RCA projects has immensely benefited the country in several ways as follow:

a) It has been possible to strengthen the R & D infrastructures through development of human resources and upgradation of laboratories;

b) Exchange of information and experience on a regional basis has helped innovative application of results of R & D in different sectors of economy;

c) Expert services have facilitated acquisition of technology and access to information which are useful in reorienting R & D programmes in certain cases and making them compatible with the needs and priorities of national development; and

d) It has become possible to establish linkages with the relevant agencies in the public and private sectors as well as with institutions in other RCA countries, thereby creating an atmosphere for optimum utilization of R & D activities in peaceful application of Nuclear Energy and Technologies in endeavours for socio-economic development.

Implementation of different RCA projects in Bangladesh envisages several ways of interactions of the Coordinators of individual Projects with the RCA National Coordinator. These include formal and informal meetings with a view to reviewing of progress, identification of problems and their possible solutions, strategic planning and identification of scopes for use of the results in different sectors of economy. Briefing and debriefing sessions of the RCA National Coordinator with the participants before and after each regional RCA Event are also helpful in identifying scopes for innovative uses of results of R & D. The RCA National Coordinator is also responsible for maintaining contacts with various government officials and the private sector with a view to enhancing and strengthening linkages between R & D and needs of development of various sectors of economy. In addition to this, Meetings of all RCA Projects are arranged from time to time to review progress, identify problems and to explore potentials for cross-linkages among various activities.

Bangladesh wants to reiterate that it finds the RCA to be an useful Forum for undertaking coordinated projects on a regional basis, where problems confronting development have many features in common. Bangladesh, therefore, attaches great importance to the scopes for pooling of expertise, knowledge and information under RCA and hopes that its activities would not only continue, but actually the scope will be enhanced.

RCA
Annual Report

People's Republic of China

Reporting Period: 1996.1-12

RCA National Coordinator
Prof. Zhu Jiang
Office of IAEA Affairs
China Atomic Energy Authority
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In 1996, the 18th RCA Working Group Meeting was held at Beijing 20-24 May, 1996. 55 Participants from 16 RCA member states was attended. The current joint UNDP/RCA/IAEA Project (RAS/92/073) and the New Project was discussed. TCDC, Regional Resource Unit (RRU),RCA structure improvement,the formulation of regional industrial project, the extension of RCA agreement, future programme, budget and many other items were discussed.

The 3rd National Coordinators Meeting on Nuclear Analytical Technique was held in Beijing, Sept. 1996.

More than ten RCA activities was organized in China in 1996.
see appendix 1

RCA related Activities in China in 1997 see appendix 2.

A. Information and Technical Programme

1. Title and number of ongoing projects

2. Project Counterpart

RAS/0/013 Energy and Nuclear Planning

Mr. Zhang Qinghua — Tel: 86-10-68417733 ext.434
Assist Chief — Fax: 85-10-68422357
Division of Nuclear Power Economics — -68416616
Institute of Nuclear Industry Economics
P.O.Box 2103-40
Beijing 100037

RAS/0/019 Nuclear Information Systems — Tel: 86-10-68417733
Mr. Chen Dingdong — Tlx: 22240 CNEIC CN
China Nuclear Information Center — Fax: 86-10-68416004
P.O.Box 2103
Beijing 100037

RAS/0/021 Energy and Nuclear Power Planning

same as RAS/0/013

RAS/0/022 Public Acceptance and Trade in Irradiated Food

c/o Mr. Zhu Jiang, China'a ICGFI Designated Expert

RAS/0/023 Energy Electricity and NPP

same as RAS/0/013

RAS/4/008 Maintenance of Nuclear Instruments

Prof. Wu Wenkai — Tel: 86-10-67781331 Ext. 8599
Department of Nuclear Medicine — Fax: 86-10-67713359
Cancer Research Institute
Chinese Academy of Medical Science (CAMS)
100021 Beijing

Mr. Rong Tiehua (non-medical) — Tel. 86-10-68512211-2407
Chief Engineer — Fax: 86-10-68573780
Baoyuan Company
CNNC
Beijing 100082

RAS/4/011 Research Reactor Utilization

Mr. Jin Huajin — Tel: 86-10-69357578
Deputy Chief — Fax: 86-10-69357008
Div. of Heavy Water Res. Reactor
Depart. of Reactor Eng. and Tech.
China Inst. of Atomic Energy (CIAE)
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RAS/6/022 Strengthening Nuclear Medicine in RCA

Prof. Ruan Changgen — Tel: 86-512-5195696 Ext. 3093
Director, Suzhou Medical College — Fax: 86-512-5192662

P.O.box 12
Suzhou 215007
Advisor

Prof. Lin Xiangtong — Tel: 86-21-62489999 Ext. 477
Chief, Nuclear Medicine Section — Fax: 86-21-62489191
Huashan Hospital
Shanghai Medical University
Shanghai 200040

RAS/6/018 Diagnosis of Hepatitis B by RIA

Prof. Lin Xiangtong
same as RAS/6/022 Advisor

RAS/7/003 Radiation Sterilization of Tissue Grafts

Prof. Sun Shiquan — Tel: 86-351-7020266
China Institute for Radiation Protection (CIRP) — Fax: 86-351-7020407
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Shanxi Province, China

Mr. Tang Zhongyi — Tel: 86-512-5223637
Head, Dept. of Plastic Surgery — Tlx: 36300252 TLX CN
and Burns Unit — Fax: 86-512-5192662
First Affiliated Hospital
Suzhou Medical College
Suzhou 215007

RAS/9/006 Strengthening of Radiation Protection Infrastructure

Ms. Cong Huiling — Tel: 86-10-68512211 Ext. 3583
Deputy Director, — Fax: 86-10-68510370
Bureau of Safety, Protection and Health (BSPH)
China National Nuclear Corporation (CNNC)

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UNDP National Counterpart

(RAS/92/073)

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Office of IAEA Affairs — Fax: 86-10-68513717

China Atomic Energy Authority (CAEA)

P.O.Box 2102

Beijing 100822

Sub-project: Tracer Technology and Nucleonic Control System (NCS)

Ms. Dang Shuqin — Tel: 86-10-69357579

Head, Section of Quality Control — Fax: 86-10-69357195

Isotope Department

China Institute of Atomic Energy (CIAE)

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Sub-project NDT

Mr. Shi Jihua

NDT Center of Nuclear Industry — Tel: 86-21-64850220

SNERDI, Shanghai — Fax: 86-21-64850681

Sub-project Radiation Technology

Prof. Ma Zueteh — Tel: 86-21-59528752

Shanghai University, Jiading Campus — Fax: 86-21-59529932

Shanghai 201880

Sub-project Nuclear Analytical Techniques

Prof. Tian Weizhi — Tel: 86-10-69357308

Chief, Div. of Nuclear Analytical Lab. — Fax: 86-10-69357008

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China Institute of Atomic Energy (CIAE)
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3. Implementation and Sustainability

4. National Commitment

5. Major Achievements

I. UNDP/IAEA Industrial-Environment Project (RAS/92/073)

1. Tracer Technique

The Regional Training Course on Advanced Application of Isotope Techniques to Water Resources and Regional Workshop on Isotope Techniques in Hydrology and Geochemistry for Geothermal Energy Development in east Asia and the Pacific have been held at Lushan from 27 May-7 June 1996 respectively.

The EAG Meeting on Tracer Applications in third recovery of oil in oil fields will be held May 1997 in Dagang Oil Field.

Chinese expert on Tracer Experiment in Oil Field for Secondary Recovery visit Malaysia in Jan. 1997.

Tracer Technique applied in oil and other industry received good benefit for production

2. Nucleonic Control System (NCS)

The Regional Training Workshop on the application of NCS to Paper Industry held in Shanghai and Guangzhou from 11-20 Nov. 1996.

More than hundred sets NCS Systems now used in iron-steel, paper and many other industries. Total national investment were several ten million US Dollars had got good economic benefit for the production. As an example, In

Shanghai Baoshan Iron Steel Company, if the NCS stop work, all the production cannot continued.

3. Radiation Processing

Radiation Curing

In 1994, the consumption of various kinds of radiation cuable products estimated to be about 4000 tonnes, including industrial coating, printing ink, electronic circuit application, automobile coating, textile dyeing.

A national workshop on radiation curing was held in Wuxi November more than one hundreds participants attained.

Radiation Crosslinking

The growth of radiation crosslinking application in China is still impressive. The throughput of radiation crosslinking product-heat shrinkable material and wire and cable will exceed 1500 million RMB Yuan in 1996. Radiation Crosslinked wire and cable are widely used in China. Recently, most national activities on this subject are production and marketing and end-user-oriented.

Radiation Sterilization

Radiation sterilization of medical supplies are routinely proceeded in Chinese radiation facilities. We are also progressed some detailed research on Radiation sterilization of cosmetics and pharmaceuticals.

Radiation Vulcanization of Natural Rubber Latex (NVNRL)

A National Workshop on RVNRL was held in Suzhou, Nov. 1996. Two Chinese experts attained the International Symposium on RVNRL in Malaysia, July 1996.

Radiation Engineering

The Cobalt-60 Gamma facilities (design capacity larger than 100 Kci) in China as follows:

Year	1993	1995	1996
Facilities (sets)	50	~60	~60
Installed Intensity	6MCi	~8MCi	10MCi
Designed Capacity	23.3 MCi	~30MCi	~30MCi

Up to now, 46 industrial size EB accelerators had been set up in China. The accelerator sets installed were about 20, 30 and 44 sets in 1993, 1994 and 1995 respectively. The intensity of installed accelerators was more than 1400 KW. Some EB machines used were imported, 5 from USA, 2 from Japan, 1 from France, over 10 sets from Russia, the rest were made in domestic.

A National Workshop on Economic Beneficial Operation of Gamma Facilities was held in Qingdao from 27-30 May 1996. This is a very successful workshop.

In 1997, it is planned to organizing another similar workshop on economic beneficial operation of EB accelerators in China.

Radiation and Environment

The China EB Flue Gas Treatment project was established in Chengdu, Sichuan Province this year with financial support from Japan. Ebara Company of Japan is the main contractor, the project is also supported by IAEA.

A Regional Seminar on Radiation Treatment of Waste Water and Drinking Water is proposed held in 1997 in Shanghai, Shanghai University will be the host.

We are interested on Marine Contamination and Transport Phenomena and other marine/environmental projects.

We are strongly supported the New Project Proposal on "Radiation Processing of Polymers", Particularly on: Environmentally Friendly Polymers. Hydrogels, Plastic Wastes Recycle, Radiation Vulcanization. Natural Polymers.

Now, Radiation Processing in this Asia-Pacific area is under commercialization development, the regulation and standard of products and process are most important. For example, radiation sterilization of Medical supplies, pharmaceuticals, radiation crosslinking of wire and cable, international standards and harmonization of national standards of QC of the products and process are very important, some regional and national workshop and training are needed.

4. Non-Destructive Testing (NDT)

In China a big infrastructure on NDT have been established in some industry systems. NDT and NDE were used in many industries routinely.

5. Nuclear Analytical Technique (NAT)

The third National Coordinators Meeting for Nuclear Analytical Techniques combined with the second RCM on Applied Research on Air Pollution Using Nuclear Related Analytical Techniques in the Asia and Pacific Region was held 2-6 September 1996 in Beijing.

Nuclear analytical techniques are very useful technique for industry, human health, agriculture, environment and archaeology. China actively participate all the activities on environmental pollution analysis, airborne particulate matter analysis, ISO and other standards application, computer software, intercomparison and others.

II. Food and Agriculture (RAS/0/022)

In 1996, China had irradiated foods about 45,000 tonnes, the main products are garlic, pepper, dehydrated vegetables.

The FAO/IAEA Third Research Coordination Meeting of the CRP on Irradiation as a Quarantine Treatment of Mites, Nematodes and Insects other than Fruit Fly was held in Beijing from 15-19 July 1996. A special panel discussion on

Food Irradiation in China and particularly on food Irradiation Quarantine Treatment was organized.

Up to now, China has authorized application of 18 kinds of irradiated foods. Now China is under serious consideration on the Guideline for the authorization of food irradiation by classes of food.

China actively participated all the food irradiation related projects. We hope the irradiated food will contribute more to the human health.

For human health, solve the problem of Food-borne disease, decrease post harvest loss, quarantine treatment of food, It is strongly need to incorporate the new Food Irradiation project to the new RCA project.

The Workshop on Nuclear Technique Application in Agriculture-Pesticide residue transport and fate was held in Beijing from 27 Aug. - 10 Sept. 1996. 16 participants from Asian and African countries attained. The Institute of Application of Atomic Energy in Agriculture/Chinese Academy of Agricultural Sciences (IAAE/CAAS) was the host institution.

In the new RCA project, some important nuclear agriculture project should be included. Following we have 3 new project proposals.

III. Medical and Biological Application (RAS/4/008, RAS/6/022, RAS/6/018, RAS/7/003)

China support all the nuclear medicine, radiation therapy and radiopharmaceutal projects,

China is a active member of radiation sterilization of Tissue Grafts project. In Taiyuan and Suzhou, we have two centers.

China actively participated almost all nuclear instruments maintenance, protection, quality control related activities.

Interregional Consultant's Meeting on Upgrading of Analogue Gamma Camera with IBM PC and related Software was held in Xian, China, 8-19 April 1996.

The National Workshop on QA SPECT System in China was held in Guangzhou and Beijing, 15-19 and 22-26 April 1996.

National Workshop on SPECT QA and QC was held in Beijing, November 1996, hosted by Cancer Institute of CAMS.

The Workshop on production methods for reagents for hepatitisC Virus (HCV) Radioimmunoassay (RIA) will be held in Beijing. (postponed to March 1997)

The Research Coordination Meeting on Quantitative Nuclear Cardiology was held from 23-26 September 1996 in Beijing.

IV. Research Reactor, Energy based and General Projects (RAS/0/013, 020, RAS/4/011)

In China, there are six research reactors and two nuclear power plants in operation. Seven Miniature Neutron Source Reactor (MNSR) have been in operation, four in China, three in other countries.

Research Reactor application in material science and new material development, and Application on earth, environment, resource, water, atmosphere, all we are interested, we have some facilities, man power and experiences.

China participated nuclear power programmes related activities, such as effective strategies for nuclear power programmes and many others, the Regional Workshop on maintenance management of nuclear power plant will be held in Shenzhen, China 1997.

China was a member of Nuclear Information System project. China will do some contribution for IAEA RCA Home Page. And China Nucl. Info. Center hope serving RCA as a RRU in this region.

V. Radiation Protection (RAS/9/006)

Strengthen Radiation Protection Infrastructures was an important project, Reference Asian Man, Intercomparison of Personnel Dosimetry, the management of Radioactive Sources, environmental and food radioactivity measurement.

Radiation safety and radiation protection of Gamma and EB accelerator facilities and sealed radio source are very important title for us.

Disposal of low and intermediate level waste with emphasis on non-power sources is very important for this Asia-Pacific area.

The International Symposium on Nuclear Energy and Environment was held in Beijing from 14-18 Oct. 1996.

B. Other matters

I. Coordination

1.1 Yes. Through meeting, telephone, telefax and written Communication, ad hoc basis, phone, fax and letter several times per week. In 1997, We will organize a special national RCA counterparts meeting to commemmorating the 25 anniversary of RCA activities.

1.2 Before and affer the RCA meeting, many contact with the project counterparts.

1.5 About 3 working days per week on RCA related matter.

II. Linkages with national programmes and activities

In China, the RCA projects are really in line with national development plans, such as the 9th five year plan, the Agenda 21, the Industrial, Agricultural and Medical Application of Nuclear Techniques, Nuclear Science and Technology Plan, Nuclear Power, Nuclear Fuel Cycle, Water, Resource, Environmental and many others plans.

The National Technical Cooperation Liaison Officer and the RCA National Coordinator are in the same division. We have may relations with the State Science and Technolgy Commission, The Ministry of Health, The Ministry of

Agriculture, The Ministry of Electricity, China National Petroleum Company National Environment Protection Agency, China Isotope and Radiation Association, and so on.

III. TCDC

China as a member of RCA family, would like to sharing its experts knowledges, equipments, facilities with other member countries, In China we have many nuclear research institutes, such as China Institute of Atomic Energy (CIAE). Changchun Institute of Applied Chemistry (CIAC), Shanghai Institute of Nuclear Research (SINR) and many others can be designated as Regional Resources Unit (RRU) in Respective areas.

In 1996, following experts visit RCA countries giving serves to respective countries.

Mr. Zhang Peixin (CIAE), to Malaysia, November (posponed to Jan. 1997), for tracer technique in oil field.

Mr. Tian Weizhi (CIAE), to Pakistan, Indonesia, Thailand and VietNam, November, for Nuclear Analytical Technique.

Mr. Fei Weiqiang (SIPAI), to VietNam, December, for NCS application in paper industry.

Mr. Shi Jihua, as a IAEA expert, visit Mongolia April, for NDE training.

China can supply following items:

Miniature Neutron Source Reactor (MNSR).

^{60}Co Υ facilities and EB Accelerators for industrial application.

Several kinds of RIA kits and Radiophermaceuticals.

IV. Private Sector Outreach

In China, there are several private sector partivipated in the radiation crosslinking industry for shrinkable material production, they also participated the NTC and other RCA National activities. The output of these private sectors radiation products exceeded hundreds million RNB Yuan.

We have some available promotional materials (brochures, videos, etc.) on food irradiation, Gamma radiation facilities, Nuclear Agriculture, etc.

V. Cash Contribution

1996, China contributed 50,000 US Dollars in cash for RCA. The main activity used this money may be the Lushan isotope hydrology Training Coures.

VI. In-kind Contribution

All the training courses and meetings hosted by Chinese institutions needed some in-kind contributions.

Appendix 1

1996 RCA and related activities in China

Code	Date	Venue	Activity	Host
	4.8-19	Xian	Consultants Meeting on Upgrading of Analogue Gamma Camera with IBM PC	
NW	4.15-26	Canton, Beijing	NW on QC of Nuclear Medicine Equipment	LIH
WGM	5.20-24	Beijing	18th RCA Working Group Meeting	CNNC
NW	5.26-30	Qingdao	NW on Economic Beneficial Operation of ϒ radiation facilities	BINE
RCM	7.15-19	Beijing	3th RCM on Irradiation as Quarantine Treatment of ...	IAAE/CAAS
NCM	9.2-6	Beijing	3 NCM on Nuclear Analytical Technique	CIAE
RCM	9.2-6	Beijing	RCM on Applied Res. On Air Pollution Using Nuclear Related Analytical Techniques.	CIAE
RCM	9.23-26	Beijing	RCM on Quantitative Nuclear Cardiology	CNMS Fuwai Hospital
NW	8.30-9.10	Lanzhou	NW on Animal Production Project	GAU
NW	11.4-11.15	Beijing	NW on SPECT QA and QC	Cancer Inst. (CAMS)
RTW	11.11-20	Shanghai,Canton	RTW on NCS in Paper Industry	SIPAI
RTC	5.27-6.7	Lushan	RTC on Advanced Applications of Isotope Techniques to Water Resources	CNNC
RW	6.10-13	Lushan	RW on Isotope Techniques in Hydrology and Geochemistry for Geothermal Energy Development	CNNC

Appendix 2

1997 China's Activity Rca and Nuclear Technique

Code	Date	Venue	Activity	Host
RS	9.23-27	Shanghai	RCA RS on Radiation Treatment of Waste Water and Drinking Water	SU
NW	3/4Q	Beijing	NW on Economic Beneficial Operation of Industrial EB Accelerators	CIRA
NW	Sept.	Beijing	NW on Regulation and Standards of Radiation Facilities	BINE CIRA
NW	3/4Q	Beijing	NW on Standards of Radiation Products and Radiation Materials	CIRA
NTC	August	Chengdu	NTC on Radiation Curing-Painting	RCC
NS	October	Changsha	NS on Radiation Curing	RCC
NW	3/4Q	Beijing	NW on Radiation Sterilization QC Standards of Medical Supplies	BRC
RTC	October	Beijing	RTC on ^{153}Sm EDTMP preparation	CIAE
NTC	3Q		NTC on Control of consumer goods containing radioactive materials	MOH
NTC	2Q	Beijing	NTC on QC of radiotherapy	LIH, MOH
NW	Aug-Sept	Beijing	NW on SPECT & Improvement of Quality in SPECT Imaging	CI/CAMS
NS	Autumn	Taiyuan	NSmr on Bone Grafting	CIRP
	?	Beijing	Food Irradiation Fair	
RW	24-28 Feb.	Beijing	Expert Workshop on Optimization of Local Production and distribution of Primary Reagents for RIA in Developing Countries	CIAE
RW	3-7 March	Beijing	Expert Workshop on Diagnosis of Hepatitis B and C infection by RIA	CIAE
RW	May	Tianjin-Dagang	RW on Tracer Technique for Oil Field Development	CNPC CIAE
RW	8.25-9.5	Beijing	Workshop on Use of Nuclear Techniques in Studies of Agriculture with Emphasis on transport and Fate of Pesticide in Eco-Environment	IAAE/CAAS
NW	May	Lanzhou	NW on Animal Production Project	GAU

Institutions

SU	Shanghai Univ. (Jiading)
CIRA	China Isotope Radiation Association
BINE	Beijing Institute of Nuclear Engineering
RCC	Radcure China
BRC	Beijing Radiation Center
CIAE	China Institute of Atomic Energy
MOH	Ministry of Health
LIH	Laboratory of Industrial Health
CIRP	China Institute of Radiation Protection
CI/CAMS	Cancer Institute/Chinese Academy of Medical Sciences
CNPC	China National Petroleum Corporation
IAAE/CAAS	Institute for Application of Atomic Energy/Chinese Academy of Agricultural Sciences
GAU	Gansu Agriculture University

19TH RCA WORKING GROUP MEETING OF MEMBER STATES

Yangon, Myanmar, 10-14 *March* 1997

COUNTRY STATEMENT - INDIA

Dr. S. Gangadharan
Chief Executive
Board of Radiation and Isotope Technology
Mumbai, India

COUNTRY STATEMENT - INDIA

Dr. S. Gangadharan
Chief Executive
Board of Radiation and Isotope Technology
Mumbai, India

INTRODUCTION

We are happy to participate in the Working Group Meeting organised in this City of rich cultural heritage. We have had a very active collaboration with Myanmar through the Agency's TC programmes by way of providing experts to Myanmar and training scientists from Myanmar. India, a founder member of the RCA family, have participated in most of the RCA projects as well as all the industrial projects with UNDP assistance. A brief summary of the work carried out under the different RCA projects and a short outline of the activities under the UNDP/IAEA/RCA projects during 1996 are included in this Country Statement.

RESEARCH REACTOR UTILISATION

We had participated in the Project Formulation Meeting held at Bangkok, Thailand during June 1996 and had expressed not only our abiding interest in this topic, but had also emphasised the all-round potential of this project for the growth and application of nuclear science and technology in the Member States of this region. The topics that have been pursued include neutron beam research in condensed matter physics and making available the neutron radiography facility for the National Test House for "routine" applications. Over the years, we have organised eight IAEA/RCA Workshops, training courses and inter-regional meetings including the recent IAEA International Seminar on Development on "Enhancement of Research Reactor Utilisation" held during March 1996, at Trombay, in which over 32 countries & organisations participated. In addition to the more familiar applications like Neutron Activation Analysis, Neutron

Radiography Isotope Production for various applications, Neutron Beam Research itself has high potential for investigations of exotic materials, study of textures and residual stresses in technological materials and small angle neutron scattering studies for characterisation of surfactants, cements and ceramics.

The National Coordinators Meeting in June 1996 has recommended the continuation of this project for the next five years. The programme for the next two years, 1997-98 has been defined. A training course on Shielding Calculations is suggested to supplement the phase I activities related to reactor core calculations. A regional seminar is recommended for 1998 for effective means for dissemination of information - exchange of experience.

MEDICAL AND BIOLOGICAL APPLICATIONS

RIA for Hepatitis-B Diagnosis (RAS/6/018)

This project contributed towards the evaluation of trouble shooting of hepatitis-B kits and reagents used and improvement of the working of protocols for better utilisation of reagents. This project has helped RCA countries to prepare the agents locally at affordable cost and has created an enhanced awareness in RCA countries, particularly regarding quality control aspects.

Nuclear Medicine

As part of our continued active participation in this vital area, we are associated in three different projects on

1. Report on Certification of Quality Control and Preventive Maintenance of Instruments in Nuclear Medicine Centres.
2. Report on Comparison of therapeutic efficacy of P-32 and Sr-89 in relief of bone pain from skeletal metastases.
3. Report on PC/Gamma Camera interface and software for Data processing of clinical studies.

We also believe that the Distance Education for Nuclear Medicine Physicians and Technologists can be a viable proposition and India will be happy to share their expertise in this area. There is also need for establishing Centres for treatment and management of thyroid cancer. A Multicentric evaluation of the management of thyroid cancer can be initiated with participation of Nuclear Medicine Departments.

Six participants (three Male & three Female) are attending the Regional Training Course on Infection and Inflammation Imaging at Singapore during 10-19 March 1997.

The Department of Radiation Oncology, Tata Memorial Hospital is actively participating in the following CRPs.

Study of CRP on "Modern Techniques in Brachytherapy with Special Reference to Developing Countries" is continuing on 'Radical Irradiation for Conservative Management of Early Breast Cancer and Role of Bio-effect Models: Contract No. 7676/RB'. A total of 95 patients have been accrued on this randomized, prospective study till January 1997.

Study on "Head and Neck Cancers: Multimodal Therapy" as a part of CRP on "Randomized Clinical Trial of Radiotherapy combined with Mitomycin-C in the treatment of advanced Head and Neck Tumours: Contract No. 8495/RB" is being conducted at Tata Memorial Hospital. After the first RCM, this study was activated in January 1996, and TMH have accrued 7 patients till date. The aim of this multi institutional study is to assess the possible gain by addition of mitomycin-C to radiotherapy in the management of clinically advanced cancers of the head and neck region.

A CRP on "Introduction of Computer Assisted Dosimetry and Database in Radiotherapy of the Cervix in Asian Countries (RCA) initiated a study on "Clinical Trial for Carcinoma of the Uterine Cervix: Contract No. 6043/JN" at TMH from Sept. 1990 and the study is concluded.

Radiation Sterilization of Tissue Allografts

The Tissue Bank at the Tata Memorial Hospital for the Radiation Sterilization of Tissue Grafts (RAS/7/003) has in the year 1996 processed a variety of tissues (Table I) obtained from cadavers and other surgical procedures (Table II). Due to the rules governing post-mortem procedures, and the dependence on the staff of medical colleges situated in different campuses, the volume of tissue that can be harvested is restricted. Routinely, a set of tissue would include dura mater, a pair of ribs and an iliac crest.

Table I

Total No. grafts produced 1996

GRAFT	1996
AMNIOTIC MEMBRANE	236
SKIN	264
DURA MATER	255
RIB	25
ILIAC CREST	6
BONE BLOCK	50
BONE CHIPS	96
BONE DUST	125
HEAD OF FEMUR	6

Table II

Donors Details

ALLOGRAFT	1996
1. DURA MATER	147
2. DURA MATER + ILIAC CREST	31
3. ILIAC CREST	31
Surgical Procedures	214
1. SKIN	
2. RIBS	25
3. HEAD OF FEMUR	6

In addition, ribs are obtained consequent to thoracic surgery, and heads of femur are obtained following hip replacement surgery. Surplus skin grafts collected for grafting purposes are also banked, together with amniotic membranes obtained from neighbouring hospitals following normal deliveries. Bone powder is produced from freeze-dried cortical/cancellous bone grafts, and sieved to a particle size of approximately 250 to 750 microns. These grafts are freeze-dried, double packed and gamma irradiated with 2.5 Mrads. They have found clinical applications in a variety of clinical conditions (Table III , IV) and have been used by many surgeons in the city of Mumbai and outside.

Table III

CLINICAL CONDITIONS OF GRAFT UTILIZATION

A. BONE
B. DURA MATER
C. SKIN/AMNIOTIC MEMBRANE
D. BONE POWDER

Table IV

CLINICAL UTILIZATION OF ALLOGRAFTS : 1996

ALLOGRAFT	1996
AMNIOTIC MEMBRANE	232
SKIN	13
DURA MATER	50
BONE BLOCK	86
ILIAC CREST	36
RIB	17
BONE DUST	107
HEAD OF FEMUR	5

NUCLEAR INSTRUMENTS MAINTENANCE PROGRAMME

We organised an IAEA Interregional Training Course on Preventive Maintenance, Quality Control and Upgrading of Nuclear Medicine Instruments at Trombay, Mumbai during November 1996, in which Scientists from 22 countries participated.

The Programme of upgradation of old Analog Gamma Cameras using Personal Computers has been pursued; after the reevaluation of the cards, as requested by IAEA, at Radiation Medicine Centre & Vienna General Hospital, 10 cards have been supplied in 1996 and the remaining about 25 will be supplied during the course of the next couple of months.

PUBLIC ACCEPTANCE AND TRADE IN FOOD IRRADIATION

Although no funds were made available from the Agency or any extra budgetary contribution, a large number of seminars, workshops and specific public awareness programmes were organised in collaboration with an University and professional organisations in several places across the country.

RADIATION PROTECTION INFRASTRUCTURE

The highlight of the activities in this area during 1996 has been conducting of an IAEA/RCA Regional Training Course on Implementation of the IAEA Basic Safety Standards at Bhabha Atomic Research Centre, Mumbai in November 96. 18 participants (6 Ladies and 12 Gentlemen) participated in this training course, which also had 10 observers from India and 3 experts (provided by the IAEA). This training course was conducted using our in kind contribution. We had participated at IAEA/RCA Expert Advisory Group Meeting on Strengthening of Radiation Infrastructure Project RAS/9/006 held in Australia during November 1996. It was attended by 12 experts from 7 RCA Member States.

ENERGY AND NUCLEAR POWER PLANNING

During the period, a Regional (RCA) Training Course on Integrated Energy and Electricity Planning for Nuclear Power Development with emphasis on the ENPEP package was organised at Bangkok, Thailand from June 17 to July 26, 1996. Three officers from Nuclear Power Corporation of India Ltd and Department of Atomic Energy were nominated to attend this course as the participating national team. This course was basically the training on Software called 'ENPEP' (Energy and Power Evaluation Programme) developed primarily by the Argonne National Laboratory, USA. This model analyses in detail, the Energy - Environmental framework, to enable planning and decision making on energy related issues.

Suggestion

Based on the broad conclusion drawn from this study, it is recommended that Integrated Energy Planning should be taken up on a continuous basis, so that decision makers are kept informed of options and implications of decision taken in this field. This should cover all aspects of the energy cycle right from extraction of resources, their use in various sectors and finally disposal of residual wastes.

The software package 'ENPEP' has been used and is continued to be used in several countries. Normally, a full country study using this model would take a team of 10 to 15 persons about two years. This study may be taken up in collaboration with IAEA. This study can help in optimising the use of energy resources in our country. The software programme has been brought by the participants and NPC is coordinating with the Central Electricity Authority (CEA), New Delhi for using this package for demand forecasting and energy planning for the entire country. One officer has been designated as national liaison officer for distributing the software package to other national organisations for non-commercial use.

NUCLEAR INFORMATION SYSTEM (RAS/0/019)

We had participated in this program and had prepared and distributed a document about setting up of the e-mail facility. The Project Coordinators from six of the participating countries (Australia, China, India, Japan, Pakistan and Singapore) met at Vienna in February 1997 and drafted the final report. It was strongly recommended that a new project should be introduced in order to enhance cooperation among Member States and to consolidate the building up of infrastructure for the effective sharing of (information) resources.

The proposed sub-project on Sustainable Nuclear Information Networking in the RCA Member States envisages an outlay of US $ 550,000 for the period 1997-2001. This project will convert the exchange of literature from paper to electronic format and also create an RCA Home Page; this home page, when once completed, will be of great value for effective implementation and monitoring of all RCA projects.

Human Resource Development

In addition to one year post-graduate courses in nuclear science and technology for engineering graduates and post-graduates in science, Bhabha Atomic Research Centre (BARC), the largest R&D unit of Department of Atomic Energy (DAE), India, regularly conducts several short term and long term training courses with special emphasis on radiation safety and protection. BARC also conducts other courses for users of radiation sources in the field of medicine and agriculture. India can organise these courses for the members of the countries of Asia Pacific and middle-east.

This has reference to the correspondence between Director, BARC and Director, Divn. of Technical Cooperation Implementation, IAEA, Vienna.

JOINT UNDP/IAEA/RCA PROJECT for Asia and the Pacific on the Use of Isotopes and Radiation to Strengthen Technology and Support Environmentally Sustainable Development

NUCLEAR ANALYTICAL TECHNIQUES

The National Centre for Compositional Characterisation of Materials, Hyderabad, is now fully operational. This Centre has three different laboratories, including an Ultra Clean Laboratory, metal free with better than class 20 work surfaces.

Almost all major analytical competences are covered in this Centre, notably a 3 MV Tandetron Accelerator for wide range of ion beam based analytical applications and (I)NAA, XRF, TRXRF (being installed), ICP-MS, GD-MS and a variety of other spectrochemical, electrochemical methods, in addition to classical methods required for high precision assay/stoichiometry. The Centre had participated in the intercomparison exercise of Agency's Algae samples 391, 392, 393 and had analysed the six elements (As, Cr, Cd, Ni, Hg, Pb) of interest and additional elements. The Centre hosted the IAEA International Symposium on 'Harmonization of Health Related Environmental Measurements Using Nuclear and Isotopic Techniques" in which scientists from more than 45 countries had participated and Expert Advisory Group Meeting on Application of Chemometric and Advanced Statistical Techniques for the Evaluation of Data Produced by the NAT Sub-Project and Similar Environmental Monitoring and Research Programmes, at Hyderabad during 4-9 November 1996.

NUCLEONIC CONTROL SYSTEM AND TRACER TECHNOLOGY

Tracer Technology

The 3rd meeting of National Coordinators for Tracer Technology and NCS was held in BARC, Mumbai during 22-26 April 1996. The meeting reviewed the achievements of the sub-projects and prepared a programme for 1996. The participants visited Reliance Industries Petrochemical Complex at Patalganga and got first-hand information on the benefits obtained by the use of NCS and tracer technology in the five operating plants of the complex. India has been requested to provide experts to Thailand, Mangolia and Sri Lanka in the field of tracer technology. Only one of the three materialised due to budgetary/programme planning constraints. One Scientist did a one week expert assignment in Thailand during October 96 to demonstrate the application of tracer technology for RTD and flow rate measurement in a process system and a process pipeline in a petrochemical complex.

At the homefront, tracer service including gamma scanning of petrochemical towers continued to be provided as and when requested.

In addition, the national tracer group has recently completed a research project on "Phase behaviour in solid-liquid fluidised beds using radiotracers" in association with the University Department of Chemical Technology, University of Mumbai.

A new project on the dynamics of gas-solid and liquid fluidised beds using tracers and sealed sources is being considered by NTG in association with the same group in the University of Mumbai.

Tracer studies on the dynamics of sewage, let out to the sea (off-Mumbai coast) are being continued.

Nucleonic Control System (NCS)

NCS continued to grow in the country. There are over 5000 NCS installations now. BARC has developed a suspended sediment concentration gauge to help controlling dredging operation in ports with attendant economics.

Two Indian participants were deputed, one to the Regional Executive Management Seminar and one to the Regional Workshop on the "Application of Nucleonic Control Systems to Coal Processing Operations" in Thailand in March 1996.

One Indian participant attended the Regional Training Workshop on Application of NCS in Paper Industries in China in November 1996.

NON-DESTRUCTIVE EVALUATION

1500 participants from all over the world attended the 14th WCNDT conference in New Delhi during Dec. 8-13, 1996. The number of participants from outside India was 500. About 700 technical papers were presented and these have been brought out in the form of 4 volumes. An exhibition of NDT equipment was also held during the conference. There was very good response from exhibitors as well as from persons who visited the exhibition.

Indian Society for Non-Destructive Testing (ISNT) has constituted a Board for Certification and Examination in NDT. The Board has members from all important sectors of industry in the country. The Board has a Chairman, Controller of Examinations, Treasurer and a Secretary. With its constitution, the erstwhile National Certification Committee of ISNT ceases to exist. The Board is approaching the Department of Science & Technology (DST) of the Government of India for recognition as the sole national body for Certification and Examination in NDT.

The ISNT conducted Level-III examinations in UT, RT, PT and MT.

The various chapters of the society have conducted several Level I and II examinations for different techniques in NDT. Bhabha Atomic Research Centre conducted examinations in RT for Level I & II at various centres. The Acoustic Emission Group of India which is associated as a professional body working in collaboration with ISNT conducted a course and examination in Acoustic Emission Testing (AET). Representatives from India participated in the IAEA seminar on "Testing of Concrete" held in Singapore. Experts from India helped in conducting courses and examination in UT and RT in Burma and Vietnam under this project.

Suggestions for New Projects

The Proficiency Testing Programme being conducted under this project is very useful. India would like to participate in this programme in 1997. Inter-laboratory comparison of proficiency is an important input in the overall quality scheme in the country.

It is essential that the scope of ISO 9712 should include other techniques like acoustic emission, visual testing, leak testing and vibration monitoring. The next phase of the project should address itself to develop the syllabus and other information on these techniques similar to the one in IAEA TECDOC-629.

RADIATION TECHNOLOGY

Not only many programmes under this technology are performing satisfactorily, but also the current R&D programmes promise a great ideal for the future. Regarding operating plants, four radiation sterilisation plants for the sterilization of medical products are operating satisfactorily. The radiation sewage sludge plant at Baroda has operated well. The RVNRL plant for treatment of rubber latex is being expanded. Production of photocuring inks is now fully commercial and a number of companies are producing them. A 500 keV 20 KW electron beam machine designed and fabricated at BARC is being set up at the Board of Radiation and Isotope Technology (BRIT). When commissioned, this will give a big boost to thin film curing industry in India. A commercial demonstration plant is being set up for radiation processing of spices.

In addition to the programmes given above, there are a number of R&D programmes being pursued at a laboratory scale. These show great promise for the future. Examples are, 1) Radiation processed hydrogels for wound and burn treatment, 2) Radiation processed adhesives and coatings including pressure sensitive adhesives, 3) Radiation immobilisation of enzymes, bacteria and biomolecules in polymers and hydrogels and 4) Radiation processes in micro emulsions.

Work Plan for 1997-1998

The fourth National Coordinators meeting for Radiation Technology (Takasaki) (UNDP/RCA/IAEA) recommended three projects to be carried out in the form of coordinated research programmes.

1. Upgrading of cellulosic agrowastes to useful products
2. Radiation processing of indigenous natural polymers
3. Radiation vulcanisation of natural rubber latex.

Five subprojects including Applied Radiation Chemistry for polymers were also defined.

It was unanimously recommended that the first EAGM-CRP meeting on Radiation processing of indigenous natural polymers can be held at Board of Radiation and Isotope Technology, Bombay, India.

Detailed aspects of the above mentioned four sub-projects are covered in the Terminal Report by the CTO.

Major events during 1996

1. International Symposium on Development of Enhancement of Research Reactor Utilisation, March 1996, Trombay, Mumbai - 102 participants, 34 observers, 2 lady delegates including one from India. Countries and organisations represented - 132.

2. Specialists Meeting on Neutron Scattering, March 1996, Mumbai.

3. National Coordinators Meeting on Nucleonic Control Systems and Tracer Technology sub-project, April 1996, Trombay, Mumbai.

4. IAEA International Symposium on Harmonization of Health-Related Environmental Measurements using Nuclear and Isotopic Techniques, November 4-7, 1996, Hyderabad - 91 participants(nearly >60 from outside India), 10 observers.

5. Expert Advisory Group Meeting (EAGM) on Application of Chemometric and Advanced Statistical Techniques for the Evaluation of Data Produced by the NAT Sub-Project and Similar Environmental Monitoring and Research Programmes, Hyderabad - 4-9, November, 1996 - 15 participants.

6. IAEA/RCA Training Course on Implementation of IAEA Basic Safety Standards, 18-29 November, 1996, Trombay, Mumbai - 36 countries, 10 observers, 3 experts (2 from IAEA and one from Newzealand).

7. IAEA Interregional Training Course on Preventive Maintenance, Quality Control and Upgrading of Nuclear Medicine Instruments, BARC. Mumbai, November 4-29, 1996. 22 countries.

8. National Coordinators Meeting on the Non-Destructive Evaluation Sub-Project, December 1996, New Delhi.

CONCLUSION

We are entering the new phase of ICP-6, which will take us into the next millenium. The technical competence that have been developed over the years in different disciplines in this region should be put to judicious use to help solve problems that have been identified to be of national and regional interest, keeping in mind the need for sustainable and equitable development.

COUNTRY STATEMENT - INDONESIA

AT THE 19th RCA WORKING GROUP MEETING.
Yangon, Myanmar, 10-14 March 1997.

Mr. Chairman, Distinguished Delegates, Ladies and Gentlemen,

On behalf of the Indonesian Delegation I wish to extend our sincere congratulations to the Chairman of the 19th RCA working group meeting held on 10-14 March 1997. I am convinced that under your wise guidance and your able leadership, this Meeting will successfully meet its objectives.

May I take this opportunity to express my Delegation's sincere gratitude to the Government of Republic of Myanmar for the excellent arrangement of this Meeting. It is my great pleasure to participate in the 19th RCA Working Group Meeting, here in Yangon.

It is the view of my Delegation that the RCA programmes of activities have significantly contributed towards the progress of peaceful application of nuclear science and technology in the Member States, in particular in the fields of agriculture, animal husbandry, health/medicine and industry. I wish to recall that Indonesia has maintained its active participation in the RCA programmes since the beginning, and intends to remain an active member in the future. My Delegation is pleased to note that Indonesia has- gained great benefits from the RCA programmes.

Let me now present a brief summary of activities which have been carried out in my country in the framework of the RCA programme.

1. Regional Industrial and Environmental Project

1.1. Radiation Technology.

1.1.1 Mr. Marga Utama, staff of CAIR-Batan was recruited as IAEA expert to Philippines under the project No. Phi/8/013-03 for a two-week mission (Oct. 28 to Nov. 9, 1996) to assist the PNRI in setting up of γ-ray irradiation facility for RVNRL.

1.1.2 Dr Mirzan T. Razzak (CAIR-Batan) participated at the fourth UNDP/RCA/IAEA Meeting National Co-ordinators for radiation technology, Takasaki, Japan, 11-16 Dec. 1996.

1.1.3. CAIR-Batan is ready to participate in the new RCA/UNDP Project on Radiation Technology and will also take part in Research Contract in a subproject on RVNRL, entitled "Indigenous Polymers and Agrowaste Treatment".

1.1.4. RTC on RVNRL will be conducted at CAIR-Batan, Jakarta, 21-25 July 1997.

1.1.5. Dr. Mirzan T. Razzak (CAIR-Batan) acts as chief investigator of IAEA Research Contract entitled "The preparation of hydrogel woundressing by using radiation technique" RC. No. 8978/RO/DPA/1995.

1.1.6. RVNRL has been introduced to industry to produce condoms, baby teats, balloons, gloves, finger coats, adhesives, musks, and aprons for the protection of X-ray operators. The technology of RVNRL has been increasingly used in the Indonesian government programme for the benefits of the living in "Desa Tertinggal" (under developed village) through the promotion of small and home industry..

The industries which have supported this activity are:
- PT. Mitra Banjaran Bandung (Condoms)
- PT. Pelangi, Surabaya (baby teats)
- PT. Hery, Jakarta (adhesives)
- Small and home industry, Jakarta (gloves, finger coats and balloons, musks)
- PT. Kerta Karim, Bandung (apron for X-ray protection)

1.1.7. One scientist has jointed RTC on Industrial Sterilization: Regulation, Standards and Enforcement, Kualalumpur, Malaysia, 15-19 January 1996.

1.1.8. Good Radiation Practice (GRP) for health care products has been issued by Department of Health (1996). The application of radiation technology for commercial purposes, such as food preservation and sterilization of health care products have been successfully transferred to the private sectors. The quantity of irradiated products increases from 735 tons in 1992 to 25.500 tons at the end of 1996 and the percentage sof commodities treated are 37 % food, 28 % cosmetics, 19 % pharmaceuticals, 16 % catheter, cotton gauze, condoms and gloves.

1.1.9. Irradiation curing technique using electron beams in plywood industry in Indonesia has so far not been favoured, presumably due to the relatively high cost of irradiation curing process. Hence, the existing 300 keV Electron Beam Machine (EMB) of CAIR is mainly used for R&D, training and demonstration and some small radiation services. The 2 MeV EMB of CAIR is planned to be used for R&D as well as for as for a pilot scale demonstration plant for cross-linking of wire and cable insulation. Regarding the flue gas treatment, CAIR-Batan has taken steps to introduce this new technology to interested institutions. CAIR-Batan is also planning to use 2 MeV EBM for sterilization of health care products.

1.1.10. A National Seminar on the Application of Radiation and Radioisotopes was conducted at CAIR on 9-10 January 1995. More than 80 scientific papers were presented and discussed.

1.2. Non-Destructive Examination (NDE)

1.2.1 NDE Programme in Indonesia for 1994/1995 was concentrated mainly on trainings and seminars. The training programme was focused on the training of personnel for level 1 and 2 specialist in UT, RT and surface methods.

1.2.2. Three national seminars on NDT were conducted in the country for participants from the industries, petrochemical, shipping and aircraft companies, NDT associations and other interested participants in this field. Shortage of level 3 specialists was the main constraints in conducting level 3 training in all NDT method. Therefore, training of specialists for level 3 in all NDT methods should be given a high priority in the future.

1.2.3. At the Proficiency Testing Programme (PTP) Meeting held in Melbourne, Australia, January 1994, a consensus was reached that PTP for UT and RT specialist level 2 would be conducted on a stepwise basis.

1.2.4. For the next activity BATAN proposes:
- A National Training Course on Surface Methods Level III and UT III. This course is expected to be held in October/November 1996.
- A two-day National Seminar on Advanced NDT and Remaining Life Assessment in October/November 1996. For this purpose, we need 2 or more experts.

1.3.1. Leakage and scaling of buried water pipe lines were detected using Tc-99m for Leakage and Cs-137 for scaling in P.T Kertas Kraft Aceh, North Sumaterà (January 1996); total length of the pipe lines is about 40 kilometres.

1.3.2. Two projects on water flooding in oil fields in Sumatera (Pertamina-Husky oil field at Prabumulih and_Pertamina Lirik oil field at Lirik-Riau) using trotted water have been perfomed (October 1996).

1.3.3 To determin of Mean Residence time and residence time distribution in cyanidation tank at Gunung Pongkor Gold Mining Plant. Researchers from Batan and Tracer Expert from IAEA Dr Latzck Petryka joint together in an experiment (November 1996).

1.3.4 NEMS on Nuclear Techniques in Erosion and Sedimentation Jakarta, 2-5 December 1996. Tweenty five local participants (Batan and other institution) and 3 experts from Australia as lecturers (Mr. Greg Elliot, Prof. Ron Cox and Prof Karl Heinz Wyrwoll attended in this seminar.

1.4.1. Indonesia has benefited from the Joint UNDP/RCA/IAEA Project RAS/92//073, Nuclear Analytical Techniques sub-project, especially in the technical development of human resources. In this respect, a number of BATAN scientists have attended trainings and workshops held by IAEA such as:
- Regional workshop on environmental and industrial applications of nuclear analytical technique, January 24 - February 11, 1994 in India.
- Regional training course on advanced nuclear analytical techniques in environmental impact from industry, February 27 - March 3, 1995 in Japan.
- IAEA group training course for air pollution studies using neutron activation analysis at the University of Illinois, USA (for 4 months since mid February 1996)
- Workshop on nuclear analytical technique in environmental research and monitoring, Singapore, 3-7 July 1995

1.4.2. Immediate beneficiaries as end users for NAT are the scientists of the Environmental Management Center, Environmental Impact Management Agency and Medical Research. To date there is still no specific agreement for NAT between NNRI and Government Agencies or private sector, but there are a number of co-operation agreements on development of radioisotope applications and radiation in research and industries between National Atomic Energy Agency and Universities, Government Institutions as well as Private Sectors.

1.4.3. Introduction of NAT in environmental monitoring and research was started by a study of elemental quantification of airborne particulate samples. A one-day seminar on Airborne Particulate Analysis, October 19, 1995 in Jakarta. The seminar was organized in co-operation with Environmental Impact Management Agency and the Japan International Co-operation Agency-JICA.

1.4.4. In the future NAT is expected to contribute significantly in solving environmental problems especially in air pollution study and monitoring. Recently the Australian Agency for International Development assisted the Environmental Impact Management Agency in the development of institutional capacity and implementation of pollution control programs, such as the determination of concentration of airborne particulate matter by PIXE. In the future Batan's laboratories are expected to take over the elemental quantification of airborne particulate matter by neutron activation analysis.

1.4.5. Nuclear Analytical Laboratories within the National Atomic Energy Agency are improving their performance by implementing Total Quality Management according to international standards, e.g. ISO-25 and ISO-9000. In this respect, the two day visit of IAEA expert mission (Prof. Tian Weizhi) in mid November 1996 has guided and advised the local staffs on the practical implementation of ISO-25 standard.

1.4.6. In line with the national policies, to improve the technical capabilities of human resources, we are interested in hosting activities the training workshop on chemometric and advanced statistical technique scheduled for 1997. To strengthen its impact, the workshop should be followed the National seminar for information exchange and to help create collaboration with non nuclear environmental institutions. In addition, Indonesia is interested in hosting the the training workshop on K-0 and other advanced neutron activation analysis techniques scheduled for 1998. Indonesia will support the program by financing it partially through in-kind contribution.

2.1. Radioimmunoassy for Hepatitis B Diagnosis

2.1.1. Indonesia has been participating in this TC Project of Radioimmunoassay for Hepatitis B Diagnosis (RAS/6/018) since 1992. Indonesia is one of the countries which has an indication of a high prevalence of Hepatitis B. Indonesia has recently been able to produce all parts of Hepatitis SPRIA Kit (e.g. coated beads for HBsAg and anti Hbs as well as iodinated HbsAG and anti Hbs as tracers and negative and positive controls). Since1994 Indonesia has been supplied by the Agency with raw materials for reagents. The products of Hepatitis B reagents produced by BATAN will be distributed to local participating laboratories for clinical studies. The studies in progress this year are emphasized on the prevalence of Hepatitis B in pregnant mothers and on patient with liver abnormalities. This year the project will be extended to the production of the reagents as well as clinical study of Hepatitis C.

2.1.2. The next programme will be to spread the application of Hepatitis B reagents nation-wide in Indonesia before introducing them to RCA member countries. As stated by the Indonesian Delegation at the sixteenth Working Group in Bali, March 1994, Indonesia is going to start a feasibility study on the production of Hepatitis B kits in the near future.

2.2. Radiation Sterilization of Biological Tissue Grafts

2.2.1. At present radiation sterilized lyophylized amniotic membrane and radiation sterilized air-dried amniotic membrane have been produced at a routine basis by CAIR-BATAN Tissue Bank and Sintanala Leprasorium Tissue Bank, respectively. About ten amniotic membranes are processed weekly at CAIR-BATAN Tissue Bank. Products were used at several hospitals for open and burn dressing.

2.2.2. In 1992 CAIR-BATAN Tissue Bank introduced the radiation sterilized lyophilized cancellous bovine and human bones to several hospitals in Jakarta. At present both of those products have been used for implementation at Siaga Raya Orthopedic and Cipto Mangunkusumo as well as Fatmawati hospital in Jakarta. In 1996, more than 300 bags of radiation sterilised cancellous human bones have been applied for implantation at those hospitals.

2.2.3. Setting-up a Tissue Bank at Djamil Hospital in Padang was started since 1995. Around 100 sqm of space and several tools needed have been established through locally available budget. Several equipments supplied by IAEA have arrived (a freeze dryer, laminar flow cabinet, bone cutter, and an electrical sealing machine) at Djamil Hospital and at CAIR Batan Tissue Bank (a freeze dryer, a bone cutter and a deep freezer) in 1995 and 1996. We are waiting for a Co-60 Gamma cell that will be installed at Djamil hospital.

2.2.4. In 1996 two medical doctors (Dr. Kamardi Thalut and Dr. Bambang Darwono) were sent for training in Singapore and USA and one scientist from CAIR-Batan was trained in USA (Northwest Tissue Bank). We received three experts namely Dr.A. Czitrom and Dr. M. Strong from USA and Dr.Y.Vajaradul from Thailand in 1996. Four Seminars and one course were carried out in 1996 (in correlation with visiting experts).

2.2.5. Dissemination of information on donor selection criteria and demos on application of radiation sterilised bones grafts to several hospitals will be continued in 1997. To support the activities in Tissue Banking, Indonesian Association of Tissue Bank consisting of CAIR-Batan Tissue Bank and 6 hospitals has been established on September 1996.

2.3. Standardization of I-131 Treatment for Hyperthyroidism to Optimize Radiation Dose and Treatment Response

2.3.1. Indonesia has been selected to join the project. Prof Dr. Nursal Asbiran, School of Medicine, Andalas University at Padang, West Sumatra acts as the National Coordinator.

2.4. Nuclear Instrument Maintenance

2.4.1. As a continuation of the meeting in Vietnam at May 22-26, 1995, Indonesia has performed a survey on the implementation of Gamma Camera Maintenance on January 10-19, 1996, with the assistance of IAEA experts. This workshop was attended by 24 people from 9 hospitals and from two of BATAN's research centres.

2.4.2. From the experiences gained in maintenance, BATAN has succeeded in upgrading of Technicare analogue Gamma Camera with PC ADC interfacing. In this activity, Nuclear Equipment Development and engineering Centre of Batan has built a prototype of Gamma Camera Detector Processor, which is still developed using hybrids technology in collaboration with the Inter University Center of Microelectronics of Bandung Institute of Technology.

2.4.3. A Batan staff member participated at the Regional Training Course on Quality Control of Multy-Head SPECT System at Seoul, Republic of Korea, 26 August-6 September 1996.

2.4.4. Head of Nuclear Equipment Development Centre of BATAN participated at The Third Working Group Meeting on Regional Training Association of Gamma Camera Users at Kyoto, Japan, 30 September - 4 October 1996.

2.4.5. A Karyadi Hospital Service Engineer participated at The Regional Training Course on Gamma Camera Maintenance at Bombay, India, November 1996.

2.4.6. A BATAN Staff will participate on the Second Research Co-ordination Meeting at Seoul, Republic of Korea, 24 - 26 March 1997.

2.4.7. The last Research Co-ordination Meeting of RCA project RAS/4/008 is suggested to be held in Jakarta, next 1 - 5 December 1997.

2.4.8. The Regional Workshop on Upgrading Analogue Gamma Camera will be held in Nuclear Development Center of BATAN next 1 - 12 December 1997.

3. Agriculture Projects

3.1. Improvement of Grain-Legume Rhizobium Symbiosis to Fix Atmospheric Nitrogen

3.1.1. Although Indonesia did not participate in this project, a similar activity has been carried by the staff of CAIR-BATAN. Some promising results have been achieved.

3.2. Public Acceptance and Trade in Irradiated Food

3.2.1. Food preservation is particularly important for the countries in tropical region because of its warm and humid climate. Irradiation process is an important alternative for extending the storage life of food and for preventing food from spoilage. However, the main issue of food irradiation is still the public acceptance. Being a tropical country with large population, Indonesia considers food irradiation technology to be a very important element in the effort to ensure food safety and food security.

3.2.2. The Indonesian Health Authority has issued clearance of three groups of irradiation food commodities since the end of 1987. Clearance has been approved for grains (maximum 1 kGy), spices (maximum 10 kGy) and bulbs, tubers and rhizome (maximum 0.15 kGy). On 10 February 1995, additional clearance was issued for two other irradiated foods, namely frozen shrimps and froglegs (maximum 7 kGy). In addition, the maximum dose approved for grains has been changed up to 5 kGy for the purpose of microbial control. On 27 November 1996, one more clearance was issued, i.e. for irradiation of fresh red pepper (average dose : 1 kGy).

3.2.3. Seminar on Food Irradiation Information was organized by BATAN in October 1994 in collaboration with the IAEA. This seminar was attended by more than hundred participants from various government institutions, universities, mass media and private companies The seminar was intended as a means to disseminate information on the food irradiation technology and to stimulate exchange of views on its practical applications in order to achieve wider public acceptance. Based upon the recommendations of the seminar, the Agency agreed to provide experts to assist in conducting a proper economic feasibility study on wider commercial application of food irradiation in Indonesia. This study has been done by an expert mission provided by the Agency in 1995 as the implementation of the TC project INS/5/025 which was funded by the Government of the USA as a footnote-a project. Another expert was sent by the Agency under this project in 1996 to assist CAIR-Batan in studying feasibility of sterilizing hospital diets by irradiation.

4. Research Reactors, Energy and General Project

4.1. Reactor Utilization

4.1.1 The RSG-GAS 30 MW research reactor and its facilities located at Serpong, Indonesia, which were established as a center of excellence in Asia and the Pacific region in 1989, are open to those interested in doing R&D activities.

4.1.2. Efforts haave ben made to increase the availability and reliability of irradiation and experimental facilities and to upgrade the manpower capability.

4.1.3. The studies, analyses, tests and development of silicide fuels as a substitute of oxide fuel have been completed.

4.1.4. Coach systems for design, analysis and operating of the reactor and its systems by 1997 to support safe and optimal operation and utilization were established.

4.1.5. A Regional Training Course (RTC) on Noise Analysis Methods and its Applications on Research Reactor was submitted to the RCA Working Group Meeting for approval, for the inclusion in the future programme of RCA for 1996. Indonesia expects to host the RTC.

4.2. Energy and Nuclear Power Planning

4.2.1. Regional (RCA) Training workshop on Infrastructure Requirements and Organizational Aspects of Nuclear Power Programme was held in Jakarta, 22 - 26 April 1996. The participating countries and organizations were: IAEA, Bangladesh, China, India, Indonesia, Republic of Korea, Philippines, Sri Lanka, Thailand and Vietnam.

4.2.1. This workshop has successfully met all objectives and very useful in our Nuclear Power Programme Development.

4.2.2. The future activities should be focused on regional seminars/workshops and training mainly on: the identification of infrastructure needs in various countries; strategies on localization, standarization and self-reliance in manufacturing and construction of NP plants; financing of NPP; technology transfer and indigenization strategies; the economics of NPP; organizational aspects; strengthening of regulatory body, bids evaluation and siting.

4.2.3. A nation seminar for the decision makers on the Benefits of Nuclear Power in the Long Run will be held on December 1997.

5. Radiation Protection Projects

5.1. Radiation Protection Infrastructure

5.1.1. At present around sixty regulations, including government regulation, presidential decrees and the Director General's of BATAN decrees have been derived from the National Act No. 31 of 1964 on Basic Provisions of Atomic Energy.

5.1.2. In 1994 a new decree of the Director general of BATAN on the safe transport of radioactive materials was announced. This decree uses the IAEA Safety Series N. 6 (as amended in 1990) as a reference and is stipulated to replace the old one that has been in force since 1974.

5.1.3. Three other decrees of BATAN concerning the environmental impact management have also been announced in 1994. These decrees are in line with the Government regulation and with those of the Ministry of Environment on the same subject.

5.1.4. Batan has used the opportunities to send staff members to participate at various occasions of RTC and ITC on radiation protection and related matters. Last year about ten staff members of BATAN took part at those courses.

5.2. Reference Asia Man

Indonesia has been actively involved in the CRP on Reference Asia Man since the beginning of the programme. In the survey, the cultural and socio-economic levels of each ethnic group were taken into consideration. The data obtained from Jakarta, North Sumatra, East Java and East Nusa Tenggara were presented at the last meeting. Considering the fact that there are over three hundreds ethnic groups living in Indonesia, the data obtained so far are regarded neither sufficient nor representative of the population. For this reason research will be continued to include the data from ethnic groups in Java and some of the people living in western and eastern part of Indonesia. The research is financially supported the by government budget.

6. Strengthening Nuclear Medicine: Distance Learning Project

A co-ordination meeting on the implementation of "Distance Learning Project: for operators/technicians of Gamma Camera was organized by BATAN in Jakarta 9-10 January 1995. The meeting was attended by the Country Co-ordinator of Distance Learning Project, the Supervisors from Fatmawati and RSCM Hospitals (Jakarta) and Hasan Sadikin (Bandung), the Course Co-ordinator from Royal Prince Alfred Hospital Sydney, Australia and some staff members of BATAN. The usefulness of distance learning for operators of Gamma Camera and the syllabus were discussed, lectures on the function of a nuclear medicine technician, QA, the roles of supervisor, country co-ordinator and teaching strategies were presented.

7. INIS

7.1. Indonesia participated in the Consultative Meeting of INIS Liaison Officers as follows
a. Twenty-Second Consultative Meeting held in New Delhi, India, 26-28 April 1994.
b. Twenty-third consultative meeting held in Vienna, Austria, 20-21 May 1995.
c. Twenty-fourth consultative meeting held in Kyoto, Japan, 28-31 May 1996.
Decision and recommendations of the meeting have been circulated to the liaison officers of the member states.

7.2. Indonesia participated in the RAS/0/019 National Co-ordinators meeting as follows:
a. The first meeting held in New Delhi, India, 25 and 29 April 1994.
b. The second meeting held in Vienna, Austria, 19 and 22 May 1996
c. The third meeting held in Kyoto, Japan, 3-4 June 1996.
Decision and recommendations of the meeting have been circulated to the RAS/0/019 National Co-ordinator of the member states.

7.3. Mr. Wesley M. Taoka has been sent as a mission to Indonesia to identify the existing services, the needs of the INIS national center, the arrangements of co-operation, and the level of automation services. He was in Indonesia from 3 to 7 October 1994 and visited Libraries at Five Batan's location and the central library of the Indonesian Institute of Sciences in Jakarta.

7.4. Three Batan staff members participated at the regional (RCA) Workshop on INIS:
a. Held in Bombay, India, 22 January - 4 February 1995 (2 Batan staff members)
b. Held in Kuala Lumpur, Malaysia, 18-29 March 11996 (1 Batan staff members).

Mr. Chairman, Ladies and Gentlemen, I thank you for your attention.

JAPANESE COUNTRY STATEMENT

at

The 19th Working Group Meeting of the RCA

Yangon, Myanmar 10-14, March 1997

Mr. Chairman, distinguished delegates, ladies and gentlemen,

On behalf of the Japanese Government I would like to express our appreciation to the Myanmar Government for their efforts to facilitate the 19th Working Group Meeting of the Representatives of the RCA Member States. And I would like to offer my most sincere congratulations to you on your appointment as Chairman of the Meeting.

At the same time, I would like to take this opportunity to express our deep appreciation to the IAEA secretariat, Department of Technical Cooperation, in particular, RCA Coordinator's Office headed by Dr Kazuaki Yanagisawa, for their service to implement RCA programme activities to the best interests of RCA Member States. It is sincerely hoped that the further efforts to make the RCA even more effective and efficient than before will be taken and it will maintain its status as a most leading scheme which other international or regional cooperative arrangements may wish to follow. Japan supports in principle the attempts to review the current management arrangements for the RCA that will enable the RCA to further strengthen its capabilities. Japan is of the view that the one of the crucial elements which ensures RCA's exceptionally successful structure is the continuous support of and close interrelationship with the IAEA and other international organisations such as UNDP, with expertise in various fields.

Japanese Funded Projects

Japan has provided essential and substantial in-kind support for three major fields of RCA programme, i.e. Industry and the Environment Project in the framework of UNDP-IAEA-RCA joint project, Medical and Biological Application Project, and Strengthening of Radiation Protection Infrastructure Project, and actively participated in most of the RCA programme activities via expert services,researches, training and in-kind support. This will continue for the year 1997 as described below.

○ The new UNDP-RCA-IAEA Joint Project on "Better Management of the Environment, Natural Resources and Industrial Growth through Isotope and Radiation Technology"

Based upon the conclusion of the discussions by the representatives of Member States at the Working Group Meeting in Beijing and the General Conference RCA Meeting of Representatives during last year as well as the conclusion of discussions by Member State experts which is reflected in the Project Formulation Format(PFF) prepared by the Agency's secretariat to be submitted to UNDP for approval, the new UNDP-RCA-IAEA joint project focuses on the solution of environmental problems by use of nuclear techniques through dialogues with and technology transfer to non-nuclear institutions. Considering the importance of this joint project, Japan would like to propose that RCA should request UNDP to approve this joint project as soon as possible. If UNDP approve this joint project, Japan will participate in (1) the reutilization of agro-waste("Upgrading of cellurosic agro-waste"), (2) Sustainable Nuclear Information Network among other vast variety of subject fields of the new project. As regards Sustainable Nuclear Information Network, Japan will consider to take an active part in establishing a regional system of nuclear information, sharing nuclear information and fostering human resources.

○ Industrial Application Project

Japan took into consideration of the continued needs of Member States to develop and establish application of nuclear technology in industry, proposed and obtained support/approval at the Working Group Meeting of Representatives of last year to initiate a new Japan-funded Industrial Project on "Advancement of Nuclear Technology in Industry" . Details of the subjects to be included under the project were deliberated at the Expert Advisory Group Meetings to formulate new RCA industrial application project held in Japan, July 1996. This project plans to cover such subject areas as (1) radiation processing of natural polymers, (2) radiation vulcanization of natural rubber latex(RVNRL), (3) application of low energy electron beams(new proposal),(4)non-destructive evaluation for concrete and non-metallic materials.

○ Medical and Biological Application Project

Since 1983 when Japan proposed and initiated coordinated research programmes on radiation attenuation of antibodies, diagnosis of liver diseases through nuclear medicine techniques, and radiotherapy of cancer, Japan has placed emphasise on developing and establishing nuclear techniques in medical and biological application. Japan notes with pleasure that an atlas of RI and ultrasound images of liver diseases was published last year which was the concluding product of Japan-funded coordinated research programme on liver diseases. Another Japan-funded coordinated research programme progresses successfully on inter-comparison of standardized modality using iodine-131 in the treatment of thyroid disease which are prevalent in the Region. In the last Working Group Meeting held in Beijing, Japan proposed a new project on "Transfer of Technology for the Production of Co-60 sources for Brachytherapy" with support from many Member States, which was then endorsed at the last year's RCA general Conference Meeting of representatives. Due to minor administrative reasons, this project has not started yet but expected to be implemented shortly.

In the field of medical application as a whole, Japan wishes to support strongly the idea to formulate a thematic project whereby all the IAEA-RCA programmes of medical application are programmed and coordinated consistently with appropriate yearly review so as to guarantee proper and efficient implementation. Such a scheme has been introduced and has worked effectively in the case of radiation protection project and UNDP-RCA-IAEA environmental project.

○ Radiation Protection Project

In 1987 following the Chernobyl nuclear power plant accident, Japan proposed to initiate a new RCA project in the field of radiation protection. With the strong support and participation from all the RCA Member-States, Strengthening of Radiation Protection Infrastructure Project was formulated and initiated with the initial major funding from Japan. This project developed successfully through Phase I(1987-1992) and Phase II(1993-1997) programme with the continuing active and strong participation and support as was seen in the increasing number of funding Member States. It has made significant contribution to upgrade radiation protection levels in the RCA region and it is expected that a new programme will start from 1998 and onward in order to further intensify radiation protection capabilities in the region. Japan wishes to endorse the principles and framework of the new project which was formulated in Korea on February 24-28, 1997, and will provide support, financial and otherwise, to such programme components as standardization and upgrading of personal dosimetry, inter-comparison of radioactivity measurement, Reference Asian Man studies etc., through cooperative exercises, workshop and training courses, and coordinated researches.

Japan will positively consider its financial support to the project "Preparation for Disposal of LILW from Non-power Sources", provided it will turn out very useful with the given budget and the proposed scheme.

Others

As regards other projects such as those in agriculture, research reactor utilization, and energy, Japan will consider expert support on an "as necessary and possible" basis due to

budgetary constraint as in the past.
As a supporting activity to RCA programme, National Institute of Radiological Sciences(NIRS) in cooperation with Japan International Cooperation Agency(JICA) conducts every year a training course at advanced level of one month duration on application of radiation and radioisotopes in medical, biological and environmental sciences. The course is titled "Human-Radiation Interface", and is scheduled to be held this year from Oct.13 to Nov.14 accommodating about 8 Participants from RCA countries.

Conclusion
This year is seeing the 25th anniversary of the RCA and it is a good oppotunity to gather the attention of related people to this important programme. Therefore Japan would like to ask IAEA hold some cerebration activities at the next General Conference of the RCA. Japan will consider some finnancial contribution to the acivities, if other Member Staes support this idea. Needless to say, the RCA has over the years performed outstandingly well in terms of peaceful use of nuclear science and technology. In order for the RCA to take us to a new century, Japan supports the second extension of the 1987 Agreement. As long as the RCA continues to develop, it is inevitably encountering challenges and changes. Japan, together with cooperation from the other Member States, is ready to play a part in making the RCA more efficient and effective in the future. Japan firmly believes that the RCA will continue to play an important role as a viable model in fostering close regional cooperation and understanding on nuclear issues.
Thank you.

Country Statement of the Republic of Korea

The 19th RCA Working Group Meeting

Yangon, Myanmar, 10 - 14 March 1997

As a representative of the Korean delegation, I am very pleased to participate in this 19th RCA Working Group Meeting. On behalf of my delegation, I would like to express our sincere appreciation to the Government of Myanmar for hosting this important meeting with such warm hospitality. Also I would like to take this opportunity to express our deep appreciation to the secretariat of the International Atomic Energy Agency(IAEA) for their hard work and excellent arrangements made for this meeting.

The Korean Government continually bears in mind the great importance of regional cooperation in the Asia-Pacific region. As the Asia-Pacific region is expected to emerge as the world's most active in the development and use of nuclear power in the coming decades due to its rapid economic growth, it is desirable for Asia-Pacific countries to explore and find suitable ways for developing regional cooperation programs. In this connection, I believe that the Regional Cooperative Agreement(RCA) has played a key role in the promotion of peaceful uses of nuclear energy in the region, providing an effective means through which regional cooperation is promoted and encouraged.

The various activities of the RCA have contributed to greater collaboration in our region by providing a wide range of benefits to its member states and by facilitating the transference of nuclear technology to industry. However, continuance in the reaping of benefits from such technology transfer requires a concrete partnership among the nuclear research institutes(NRIs), technology end-users, and government decision-makers. Such a partnership should be established from the start of any project and cemented throughout the whole technology transfer process.

In this sense, the development stage of each member state in the different sub-areas of technology should be reviewed carefully, and the most appropriate way of implementing the project in each member state should be applied in that state. The RCA projects can be used to assist in building up the technical capabilities of the national NRIs of those countries who lack a strong science and technology infrastructure. In order to facilitate and promote the transfer of nuclear technology to developing Member States, it is recommendable to expedite technical co-operation among the Developing Countries(TCDC) in the region. The RCA national coordinators also must continue to play their important role in order to maximize the efficiency of the RCA projects. Each and every national coordinator should try to do his or her best to find the most effective way of implementing the RCA projects and to map out strategies to link RCA projects with national programmes and IAEA-TC projects.

The Republic of Korea has been participating in almost all the activities of the RCA projects and has greatly benefitted from them. The projects have greatly contributed to our national socio-economic development. I would like to take this opportunity to describe some of the RCA Project activities going on in Korea :

1. Regional, Industrial, and Environmental Project (RAS/92/073)

1.1 Tracer Technology and Nucleonic Control Systems

The Korea Atomic Energy Research Institute(KAERI) hosted two expert group meetings, one on advanced data analyses of radiotracer flow experiments and physical model, and another on Routine Analyses of Radiotracer Flow Experiments and Physical Model, from 8-19 April 1996 and from 3-14 April 1996, respectively. At these meetings, the flow rig and RTD software developed by KAERI's National Tracer Group(NTG) and Dr. Tyun's RTD software were used for training.

In Accordance with the decision of the 1996 National Coordinators' Meeting in Bombay, which focused on supporting the less experienced member countries in building a Flow Rig for practical tracer experiments, Dr. Joon-Ha Jin was dispatched to Myanmar and Bangladesh from 25-30 November 1996 and from 17-22 December 1996, respectively. He advised on how to construct the Flow Rig and gave lectures on the applications of the Rig and of the RTD software in data analyses. KAERI conducted a series of tracer experiments to study the movement of water and flocks in pilot plants for optimization of water treatment systems. It also conducted tracer experiments to measure gas flow rates and study residence time distributions in irradiation chambers in flue gas treatment pilot plants to evaluate the effect of baffles on system efficiency.

KAERI plans to continue its research activities on tracer technology to improve industrial and environmental application technology and will dispatch an expert to Vietnam to guide in the building of a Flow Rig for tracer experiments.

1.2 Non-destructive Evaluation(NDE)

Last year, a Korean expert took part in the national training course held in Vietnam as a consultant and another one in the regional workshop on Non-destructive Examination of non-metallic materials held in Singapore. Korea believes that the more workshops and seminars on NDT technology would be beneficial to all of the RCA member countries. Thus, it is desirable for the IAEA to support these activities continuously to promote the relevant technical cooperation.

1.3 Radiation Technology

In Korea, the radiation technology is commercially utilized to five areas such as crossfired wire, shrinkable tube, precuring of automobile tire component, crosslinked foam and sterilization of medical products.

Samsung Heavy Industries Co. has begun to operate a small scale pilot plant with capacity of $200Nm^3/h$ for the EB treatment of incinerator flue gases and coal-fired flue gases. The KAERI cooperated with Samsung Heavy Industries in figuring out the flow rates and flow pattern of flue gases in the reactor. A private company, Green Pia Tech., has operated a commercial irradiator of 500kCi Co-60. The company has sterilized approximately 700 tons of medical product every year. It is expected that one or two more commercial irradiators will be constructed. Last year, the national seminar on flue gas treatment using EB was held at the KAERI and at the Pohang Technology University sponsored by the UNDP/RCA/IAEA project.

1.4 Nuclear Analytical Technique(NAT)

In Korea, the nuclear analytical Technique is not fully utilized in environmental monitoring or related research projects. However, in the near future it is anticipated that NAA will be more applicable to the study of environmental problem.

Last year KAERI held a workshop and training course on application of ISO-25 and other international standards in laboratories employing nuclear and complementary techniques for environmental analysis. We will continuously carry out analysis of airborne particulate matters as well as environmental samples including geological and biological samples to study environmental pollution. Also, we will try to promote public awareness and acceptance on these kinds of nuclear techniques in Korea.

2. Medical and Biological Applications of Nuclear Technology

2.1 Radiation Sterilization of Tissue Grafts (RAS/7/003)

In 1996, a Korean expert, Dr. Jung-Kun Kim presented lecture entitled "Bone Biology" at the IAEA sponsored meeting on Radiation Sterilization of Tissue Graft in Singapore. In April 1996, a Korean co-ordinator, Gae-Sik Chun, also attended the IAEA sponsored meeting on the same topic which was held in Gold Coast, Australia.

The korean project coordinator has been trying to solve various legal issue which were related to tissue donation. The coordinator has also been discussing closely with the officers in charge of those issues within the Ministry of Human Health Services and Welfare as well as the Ministry of Science and Technology of the Republic of Korea in order to actively participate to the QA in Radiation Sterilization of Tissue Graft of FY97 IAEA project.

2.2 Certification of Quality Control and Preventive Maintenance

All instruments are divided into 6 areas and a pilot hospital in each area is selected to facilitate the quality control and preventive maintenance of nuclear medicine equipment. A national coordinator of this project, Dr. Kim of the Korea Cancer Center Hospital(KCCH), has regularly visited the pilot hospitals to collect information on the status of the maintenance of nuclear medicine equipment and given lectures on quality control and preventive maintenance of nuclear medicine.

Last year, Korea hosted the Regional Training Workshop on quality Control of Multi-head Spect. Systems. We are planing to hold a Research Coordinators' Meeting on Research and Certification of QC and Preventive Maintenance of Instruments in Nuclear Medicine Centers in Asia and the

Pacific in early of 1997.

We appreciates that the IAEA helps us introduce and spread up-to-date technologies for nuclear medicine equipment maintenance. With the continuous and rapid increase of the use of nuclear medicine equipment in Korea, it is expected that this project will be expanded.

3. Agricultural Projects : Public Acceptance of and Trade Development in Irradiated Food In Asia and the Pacific.

Since the Ministry of Health and Welfare published the booklet with regard to the usefulness of irradiated food in 1994, Korea has continuously tried to enhance public understanding and to change the consumer's attitude in a positive way and to disseminate widely the information about wholesomeness of irradiated food to general public.

At present, Samyang GNEX, one of leading food companies, is positively considering the construction of a 1,000kCi commercial irradiator with a maximum capacity of 5 MCi for starch production and other processing. Also one of the pharmaceutical conglomerates intends to install a commercial irradiator of 500 kCi of Co-60. KAERI participated in the RCA CRP on "Investigation for Irradiation Effect on Functional Components of Medicinal Plant" under the RCA Research Agreement No. 8171/CF.

In order to vitalize the use of commercial irradiation of food, Korea will make its efforts to broaden the items of food irradiation based on the principle of domestic and international regulations and standards, and strengthen consumer education on food irradiation technology.

4. Research Reactor and Energy-based General Project

4.1 Research Reactor Utilization

Last year, the country progress report was submitted to the Expert Meeting on Progress Reviewing of Neutron Radiography Programme held in Jakarta. Also, a project counterpart attended at the RCA National Coordinator's Meeting on Research Reactor Utilization. In this meeting, it was requested to the Agency to hold the five regional workshop/training course/seminar during 1997-1999. The KAERI will host a two weeks Regional Training Course on Neutron Radiography in September, 1997.

4.2 Nuclear Power Planning

Korea sent two experts as lecturers to "the Workshop on Infrastructure Requirements & Organizational Aspects of NPP's" held in Jakarta from 21 to 27 April 1996. In this workshop, our experts showed their willingness to share our expertise and experiences with the RCA member countries and demonstrated their experience which had been acquired through the design, construction and operation of commercial nuclear power plants in Korea.

4.3 Nuclear Information System Project (RAS/0/019)

A Korean expert has participated in Expert Advisory Group Meeting held at Kyoto in Japan. In this meeting, it was recommended that each member country should create the DB for national experts covering nuclear science & technology as well as information science and technology for users. This is to facilitate the contact among member countries through the Internet. At present, Korea is considering the creation of an Internet homepage in order to explain the activities of the RCA project.

5. Radiation Protection

5. 1 Radiation Protection Infrastructure

Korea is actively participating in the IAEA/RCA project on Strengthening Radiation Protection Infrastructure, whose goal is fostering and strengthening radiation protection infrastructures in RCA member countries. We have uniquely two coordinators to encourage and to diversify the cooperation of this project, and five sub-coordinators are designated on specific sub-projects.

KAERI is planning to hold a Workshop on Internal Monitoring and Dosimetry at KAERI's Nuclear Training Center. The workshop was supported by several RCA member countries who need the internal monitoring technology and dosimetry program. The workshop will be held with financial and technical aid of the Agency and with an in-kind contribution of Korea.

Under the decision of the EAGM held in Australia, Korea hosted the Project Formulation Meeting for Phase III(1998-2002) of RAS/9/018 project from 24 to 28 February 1997. On this meeting, Korea proposed a new project titled "Environmental Radiation Monitoring", and the PFM approved it. The objective of this newly proposed project is to strengthen regional cooperation in environmental radiation monitoring and establish a regional system for environmental radiation monitoring. The output of this five year project will be the regionally harmonized measurement technology and capability for environmental radiation monitoring through intercomparison and the establishment of a regional baseline data, and system for environmental radiation monitoring.

The Korean Government sincerely hopes that all Member States of RCA could be able to share and exchange the environmental radiation data through the operation of a regional network of environmental radiation monitoring, which is to be constructed, so that all Member States can be assured that we achieved and maintained a high level of nuclear and radiation safety in the region.

5.2 Reference Asian Man

[Studies in Korea on Ingestion and Organ Content of Trace Elements of Importance in Radiological Protection]

Korea has made strenuous efforts to collect data about Korean standard human in order to establish guidance and limits for radiation protection purposes. Even though it will take a long time to collect the required data, many important experimental plans and tools must be set up at the first stage of this research. Human diets samples will be collected by way of using a market basket study based on the Korean standard food consumption scheme reported by the Korean Society of Foods and Nutrition.

In Korea, collection of human tissue samples is not easy. The tissue samples of sudden death people can be collected with the help of forensic pathologists. The analytical techniques to be used for this project will be mainly Instrument Neutron Activation Analysis(INEA), Epithermal Neutron Activation Analysis(ENAA) and Radiochemical Neutron Activation Analysis(RNAA). A newly constructed 30 MW research reactor at KAERI will be used for this research with a Cd-lined irradiation hole. The feasibility study is finished. In addition, Korea invited one IAEA expert to establish the RNAA method which is essential to determine I, Si, U and Th concentrations quantitatively in diet and human tissue.

6. Conclusion

The Korean Government believes that the RCA project is an effective mechanism for applying nuclear technology to promote industrial and environmentally sustainable development of RCA member states. I would like to express my satisfaction with the results of the various activities of the RCA under the strong commitment of the member states.

The Government of Korea will continue to support all activities of the RCA project and participate in them to the fullest extent possible. She will carry out her share of responsibility in making the project a success with enthusiasm and diligence.

Thank You.

COUNTRY STATEMENT of MALAYSIA
Nineteenth RCA Working Group Meeting
10-14 March 1997, Yangoon, Myanmar

INTRODUCTION

The Malaysian delegation would like to express our sincere gratitude to the Government of Myanmar for the warm hospitality extended to us. We also wish to congratulate the Myanmar Atomic Energy Commission for the organization of this Meeting. This 19th Working Group Meeting is also significant in that it coincides with the 25th anniversary of the RCA Programme. In this report we summarize the activities carried out in 1996 under this programme.

PROJECT PROGRESS

A. Industrial and Environmental Project:

A.1 Non-Destructive Testing (NDT)

Having successfully established the national NDT Qualification and Certification Scheme through which thousands of practitioners have been certified, MINT is now strengthening her capability in the application of NDT for non-metallic materials. A procedure for the inspection of bridges and buildings were developed in 1996. To further enhance our capability in NDT, Malaysia supports and will participate in the new projects *Harmonization of Qualification and Certification of Level 3 NDT Personnel and NDT in Concrete Building and Bridges*. MINT has also established a Gamma Projector Maintenance Center in response to a new regulation requiring all gamma projectors in the country to be certified by an approved maintenance facility.

A.2 Tracer Technology

The MINT Tracer Technology Group has developed TAFLOSS and COLSCAN. TAFLOSS is used for analyzing the integrity of storage tank floor and COLSCAN for external scanning of distillation columns. Both techniques have gained acceptance as non-evasive inspection methods and as rapid diagnostic tools in the petrochemical industry. Last year, COLSCAN won the Petronas Inventors Award.

A.3 Radiation Technology

A National Seminar on EB-technology for flue gas treatment was organised by MINT on 21 May 1996 as part of the activities of the *Radiation Technology for Treatment of Flue Gases, Sewage Sludge and Municipal Waste Water* project. Following the Seminar, MINT and TNRD (Tenaga National Research

Development Sdn. Bhd.) conducted a feasibility study on EB-technology for purification of flue gases from a coal and oil fired electrical power plant owned by Tenaga Nasional Berhad with the assistance of IAEA.

In *Advanced Applications of Radiation Technology - radiation technology for biomedical application*, MINT has successfully developed Hydrogel for treatment of wound.

Promotional efforts for the use of *Radiation Curing Technology* in printing industry in Malaysia continues. The printing industry is the largest user of UV curing technology, followed by the electronic industry. Efforts are also being made to promote the use of radiation curing in wood based industries.

A pilot plant with the capacity to produce 6,000 cubic meters/year of *Radiation Vulcanised Natural Rubber Latex (RVNRL)* utilizing 1.0 MCi cobalt-60 radiation source was commissioned on 12 March 1996. Following this commissioning, MINT organized the Second International Symposium on RVNRL from 15 - 17 July 1996 and the RVNRL Expert Advisory Group Meeting on 18 - 19 July 1996.

Radiation Sterilization for medical disposables using gamma radiation is now an established technology in Malaysia. At present there are three gamma irradiation facilities in Malaysia providing irradiation services to the medical product industries. These facilities adopt the international standards and comply with the recommendations of foreign and international authorities such as US Food and Drug Authority, EUROMED and ISO.

A.4 Nuclear Analytical Technique

A study on chemical characterisation of air particulate matter in the Klang valley area was undertaken by MINT under the RCA Co-ordinated Research Programme on *Applied Research on Air Pollution Using Nuclear-related Analytical Techniques*. An evaluation of possible health hazards to the population and the identification of source emission will be conducted.

A.5 Measurement of Marine Contamination and Transport

In collaboration with the Department of Environment, National University of Malaysia (UKM), Department of Marine Sciences and Chemistry, Department of Fisheries, Agricultural University of Malaysia (UPM) and Fisheries Research Institute, MINT has successfully conducted a study on marine pollution and transport phenomena in several areas in Malaysia including sampling of marine sediment along the Straits of Malacca. Pollutants such as petroleum hydrocarbons and chlorinated compounds and other pesticides residue were ascertained and a technique for sedimentary layer dating was developed.

B. Medical and Biological Applications of Nuclear Techniques:

B.1. Radioimmunoassay for Hepatitis B Diagnosis

Local researchers have been successfully in assembling quality RIA kits for use in several research projects. A truly interactive multimedia software for diabetes mellitus to relate the laboratory investigation to the cost of the investigation was developed to encourage optimal use of diagnostic tests. In addition another multimedia software for steroid receptor assay was developed for self-directed learning.

B.2. Radiation Sterilization of Tissue Grafts

There now exists two tissue banks in Malaysia; one at MINT and the other at Hospital Univerisiti, Universiti Sains Malaysia (USM), Kubang Kerian. In March 1996, MINT Tissue Bank assisted the Philippine Tissue Bank by supplying 263 pieces of amnion tissue grafts for use in treating burn victims of the fire tragedy at a discotheque nearby Manila.

B.3. Strengthening Nuclear Medicine in RCA Countries

The project *Distance Assisted Training Programme for Nuclear Medicine Technologist* has been proven to be of benefit to Malaysia and it is hoped that this project will become a regular training programme for technologists in the region. Inclusion of materials on SPECT, which is an important area in nuclear imaging, would improve the training programme further.

B.4. Maintenance of Nuclear Instrument

MINT is now being recognized as the center for nuclear instrument maintenance in the country. Efforts are currently being made to promote quality control especially for nuclear medicine instrument.

C. Agriculture Project:

C.1. Public Acceptance and Trade in Irradiated Food

A survey on awareness and acceptance of food irradiation by the food industries was conducted by MINT. While response to the survey was quite encouraging, the technology is not yet well accepted by the industry.

D. Radiation Protection:

D.1. Strengthening of Radiation Protection Infrastructure

Malaysia actively participates in personnel training and laboratory intercomparison programmes through this project. Among the benefits include skill and competency upgrading of personnel as well as the capability of the laboratories. Malaysia will continue to participate in future activities in order to further strengthen radiation protection programmes in the country.

E. Research Reactor Utilization and Energy-Based Project:

E.1. Research Reactor Utilization
The Small Angle Neutron Scattering Spectrometer (SANS) was successfully commissioned last year. It is now available for use.

E.2. Energy and Nuclear Power Planning
Tenaga Nasional Berhad (TNB), the biggest electricity utility company in Malaysia is continuously updating its data input and incorporating new modeling aspect of the IAEA released WASP 111/1V electricity generation planning package.

CONCLUSION

It can be concluded that all projects have progressed satisfactorily. One of the factors for this development is that the projects are in line with national interests and thus receive adequate attention for their implementation by the implementing agency, MINT. In this regard, we would like to reiterate that Malaysia will continue her participation in RCA activities. Malaysia will work together with the IAEA, donors and all member states for the successful implementation of RCA programme. We also wish to bring to the attention of this meeting that this year is the 25th anniversary of MINT. Several activities related to nuclear and science technology has been scheduled and one of the highlights is the International Nuclear Conference '97 (INC'97) to be held on 20-21 October in Kuala Lumpur. This Conference is organized by MINT in collaboration with the America Nuclear Society (ANS), Malaysian Nuclear Society (MNS), and National University of Malaysia (UKM). Through this report we exted our invitation to all member states to participate in this conference.

COUNTRY STATEMENT OF MONGOLIA
19TH RCA WORKING GROUP MEETING
10 - 14 MARCH 1997
YANGON, MYANMAR

Mr.Chairman, Distinguished Delegates, Ladies and Gentleme,.

It is my great pleasure to participate in the 19th Working Group Meeting of the RCA Member States here in Yangon, and I would first like to congratulate you on your election to chairman of this meeting.

On behalf of Mongolian Government I would like to express my deep appreciation to the Government of Myanmar its diligent work in planning and hosting this meeting and the warm hospitality extended to us.

I'm very happy to state that RCA is an effective instrument of regional co-operation between all member countries and has played a key role in the promomtion of peaceful uses of nuclear science and technology for mutual benefits of this region. We are confident that the activities of the RCA have contributed to providing a wide range of benefits to its member states and to transfering nuclear science and technology to industries.

I would like to take this opportunity, to briefly report on the activities carried out in Mongolia as follows:

Non-Destructive Testing: Since 1993 Mongolia is participating to joint UNDP/RCA/IAEA subproject for NDT. NDT application in Mongolian industry have in fact been present for some time, but only not on the same scale or technical level as the other countries in region. The national qualification and certification system for NDT personnels is not established and NDT organization is not formed also. Main NDT methods have not been put into up-to-date industrial application in Mongolia. With the implementation of IAEA TC Project MON/8.003-"Gamma Radiography Training", a radiographic testing laboratory was established at the Technical University of Mongolia (TUM) and equipment for gamma and X-ray radiography was provided for training purpose together with fellowships training and expert missions be supported for personnel training and consultations during 1992-1994 period. All of these have further enhanced Mongolian actual strength in providing national training and service inspection. NDE long-term expert of joint project Mr. Shi Jihua was visited to Mongolia in period of 6-12 April 1995 and evaluated the current status of NDT applications. He also attended in the first national NDT seminar held at the TUM. The national seminar was very profitable from the standpoint of promoting NDT activities in Mongolia. If follow the IAEA experts recomendations and our need we have following recomendations and suggestions:

-to continue to participate in various RCA training activities. It is very important for reduction of the disparity between Mongolia and the other regional countries in the application of NDT technology.
- The assistance for conducting RT-2 training course in 1997 is highly recommended because there is great need of having certified Level 2 NDT personnel in Mongolia to carry out service inspection and trianing. In addition, a UT-1,2 training courses are also expected to be held as soon as possible due to the importance of ultrasonic technique in industrial inpection and presently no UT certificate holder available for urgent need.
- Additional inputs of assistance are expected to provide aid in kind to perfect the radiographic testing laboratory supported by above mentioned IAEA TC project, especially to offer a variety of accessories (for example, new gamma source) in order to make in use of the existing facilities for the daily purposes of training and service inspection.

Tracer Technology and Nucleonic Control Systems: A national seminar on the use tracer technolgy for water study was held at Water Policy Institute on November 1996. Seventeen specialists from that institute and universities participated in the seminar and lectures were given by local specialists trained through the Agency's regional interregional measures. During the seminar was proposed project on th e use of tracer for modelling cheking a distribution of waste water in one river near which situated big copper and molibdenium ore enriching plant.

Unfortunately, we did not use the expert service proposed by the Agency in this field because of winter time.

With regard to nucleonic control system, as the result of national seminar on the use of NCS in mineral processing, held in Ulaanbaatar two years ago and recognazing visit of Australian experts-lecturers of this seminar to the Erdenet plant Multi-Stream In Stream Analysis System (ISA) for copper-molibdenium processing circuits is ordered from AMDEL.

Four specialists participated in REMS and RW, held in Thailand, 11-23 March and one - in RTW, Shanghai and Guangzhou, 11-20 November.

Radiotion Technology: Two specialists from our country participated in regional training courses - 15-19 January, Malaysia and 12-23 October, Bangkok.

Nuclear Analytical Techniques: Some of the research and development activities carried out summrized below :

- Study of minor and trace elements (toxic and essential) in Environmental and Biological samples:
foodstuffs and drinking water, tissues and fluids .
- Monitoring of heavy metal pollution in rural and urban air , surface and ground water and industrial effluents .
- level of minor and trace elements in soil and sediments.
- Monitoring of atmospheric pollution's deposition.
- Intercomparison studies of Reference Materials Analysis.

A total reflection X-ray fluorescence analysis method has been developed and applied for the analysis of trace elements in foodstuffs, water and geological samples.

Manpower development is facilitated through participation in regional training cources. Two researchers participated in RTW in Taejon, 24 June - 5July.

Hepatitis B Screening: In 1996 was received the kits for testing HBsAg, Anti-HBs, HBeAg, AntiHbe, AFP and bulk reagents for HBsAg tests mainly from Chinese Institute of Atomic Energy on the request of the IAEA. We received three auto bead washers.. During this time were screened more than 2000 peoples including general population, blood donors, patients with different liver diseases, pregnant mothers and hospital workers from the Hospital of Infectiuos Deseases, Cancer Research Center, Blood Transfusion Center and other hospitals in Ulaanbaatar. Some results of the study were presented in National coordinators meeting in Singapore. More detailed presentation of results was given in March, Beijing.

Regarding to that I would like to point out that results from this project indicate that more screening programmes and immunization are still needed ti prevent from hepatitis infections in Mongolia. The development of RIA/IRMA techniques let us to test more than 0.4 percent of all population and ti identify hepatitis viruses widespreaded in our country. As a result of the use of I-125 in the diagnosis of Hepatitis infections gave the the opportunity to develop expertise within the country.

Care and Maintenance of Nuclear Medicine Instruments: In 1996 second hand gamma camera was installed in the First Sate Clinik. The main activity was to install and provide a good working condition for this camera.

Energy Based Projects: We are reconsidering our attention to this projects because of difficult condition in the energy branch of Mongolia. Three persons attended the RTC on Integrated Energy and Electricity Planning for NP Development held in Bangkok, Thailand. Another one participated in RTC held in Taejon, 9-30 October 1996.

Radiotion Protection Project: Our two institutions, Central Radiological Laboratory and Neclear Research Laboratory of the National University of Mongolia have participating in the 2nd IAEA/RCA Personal Dosimetry Intercomparison on Photons. We consider that the intercomparson would be actual and fruitful measure for harmonizing methods and data used for calibration of dosimeters and survey instruments for occupational radiation protection, updating and developing an external dosimtry service in Mongolia.

One specialist from our country has participated in the RCA training workshop on contamination monitoring hel in Tokai-mura, Japan in October 1996. The result of this workshop was helpful and fruitful for radiation monitoring in surface contamination because of a fisrt training for us in this field.

Conclusion.

In conclusion, as a delegate from Mongolia I wish to express our satisfaction with the implementation of various RCA activities and hope for further promotion of regional cooperation in peaceful uses of nuclear science and technology. We look forward to continue cooperation under RCA.

Thank you.

Country Statement of Union of Myanmar
19 th RCA Working Group Meeting
Yangon, Myanmar, 10 - 14 March 1997

On behalf of the Myanmar delegation, I would like first to express our warm welcome to the delegates of RCA member states, the representatives of IAEA and the RCA-coordinator. We record our thanks to RCA member states and the RCA secretariat for this opportunity of hosting the 19th WGM of RCA.

Myanmar has joined RCA only in 1994; yet, our eagerness and interest in participating in RCA activities is strong. Since we joined the RCA, we have been keenly looking for opportunities to participate in the RCA-frame work. Of course, there have been occasions in which we were slow to grab opportunities.

In fact, in the past two years we have made a breakthrough, in the sense that we have started on the path of developing nuclear technology. Indeed, in many areas we were able to start nuclear technology applications, and almost all of these have been made possible by RCA involvement.

Myanmar is interested in not just obtaining technology from its more advanced RCA-partners. We are determined also to contribute to further development of nuclear technology by participating in RCA projects and research work. Presently, we have some modest research programmes in different areas of nuclear applications. In future we will improve and also expand our programmes, and we believe we will succeed in our endeavors.

A recent development we consider worth reporting is the creation of a new Ministry of Science and Technology in Myanmar. This Ministry is now responsible for Atomic Energy Affairs. It is committed to developing nuclear technology applications and is keenly looking for opportunities for international cooperation, particularly in the RCA.

Mr Chairman,

I have a brief presentation about our nuclear activities during 1996.

1. Industrial and Environmental Projects

We successfully got this project started in 1995. It is now continuing satisfactorily. We have had, during 1996, a National Training Course on

Radiography (Level I) and National Training Course on Ultrasonic Testing (Level II). We have also planned a Radiography (Level II) Course during
1997. We now have a core of trained technicians for Ultrasonic testing (Level II) and Radiography (Level I); and in a short while we will have raised the level I radiographers to level II.

At the same time, we can report that demand for NDT from industry is emerging and is expected to increase. Currently, oil and gas companies operating in Myanmar are using NDT for testing new gas pipe-lines. Although, our technicians are not yet involved directly in these works, we are providing radiation protection services for the radiography work of sub-contractor companies. Also we have been approached by shipyards for NDT work. These are indications that we have indeed made encouraging advances.

1.2 Tracer Technology and Nucleonic control Systems

This is another area in which we have made a good start. In 1995, we were able to generate technology awareness by organising a 3 day seminar on Application of Radioisotope Techniques to Coastal Studies conducted by three Australian scientists from ANSTO, Mr. Peter Airey, Mr. Ron Szymczak and Mr. Lex Nielson.

During 1996, U Kyee Myint took part in the Regional training course in Thailand and Prof Sein Htoon took part in Expert Group Meeting at Kaeri, June 1996. Two RCA activities in tracer technology took place in Myanmar: (i) demonstration of Flow-Rig system by Jin Ha at Yangon University and (ii) demonstration of Column Scanning at Thanlyin Oil refinery by Mr. Siripone Chuinta of Thailand. Instruments were also received for these activities and these would enable our scientists to continue practice.

1.3 Radiation Technology

A modest research programme we was started in 1995-96 on inhibition of sprouting of onions and potatoes. Its scope was limited by available irradiator. Myanmar Scientists were sent abroad for training in food irradiation (India), radiation processing of polymers (Japan). These few trained scientists / technicians will become nucleus who will break the ground for radiation technology in Myanmar. We were also able to send a representative to National Coordinator's Meeting in Japan for Radiation Technology.

1.4 Nuclear Analytical Techniques

The NAT laboratory at MSTRD has been operating well, providing analytical services for industry and environmental monitoring. The laboratory benefited in its manpower by having its scientists participate in regional training courses and fellowship training. However, we have not been able upgrade instruments or obtain anything new during the year.

2. Medical and Biological Applications of Nuclear Techniques

This is major area where nuclear applications are found most successful.

2.1 Strengthening of Nuclear Medicine

At Yangon General Hospital upgrading of facilities and training of technicians is progressing satisfactorily. A major addition of a Gamma-camera has been acquired as a donation from Singapore General Hospital, but it still has to be installed.

2.2 Medical Research

Diagnosis of Hepatitis by radio-immunoassay is carried out in the Department of Medical Research in cooperation with YGH. The DMR is also involved in coordinated research programmes.

2.3 Tissue Bank

The tissue bank project was revived in 1995. One member of staff was trained at MINT, Malaysia; training of more technicians have been planned for 1997. The national coordinator participated in the National Coordinator's Meeting for Radiation Sterilization of Tissue Grafts RAS/7/003 at Gold Coast, Australia. Organization, renovation of building and budget allocation have been sanctioned during the year. Tissue produced have been widely distributed to all Orthopedic Units in the country and future extension is planned to include surgical specialties such as plastic, maxillofacial, ENT and cardiac surgery.

2.4 Nuclear Instrument Maintenance

This programme has benefitted also from IAEA MYA/4/006 A National Center for Nuclear Instrument Maintenance. The progress is impressive. Seven technicians/ scientists were sent abroad for regional and international training courses and also as IAEA training fellows. Equipment is also received. Two national training courses were conducted by IAEA experts.

3. Agricultural Projects

3.1 In the area of Nuclear Techniques for the promotion of Agroforestry Systems, the Myanma Agriculture Service is planning to launch a program for Isotope Aided Studies in Productive Utilization of Salt-affected Wastelands. This plan is proceeding.
Mutation Breeding of Grain Legumes is also in progress.

3.2 A new and desirable application, the use of nuclear methods for hydrology seems not to have had a satisfactory pace of achievement yet. With national programmes for agricultural development and environmental areas such as the national project for the "Greening of Nine Districts" in central Myanmar, nuclear methods for hydrology should be given a role. This would need an effort supported in part by expertise in RCA region as well as from our side.

3.3 Food-Irradiation has got a start. For improvement and extension we require an appropriate irradiator.

4. Reactor and Energy

4.1 We do not at present have a nuclear reactor and we do not have nuclear power planning. However, we realise that the time has come for us to be properly informed about the advantages and disadvantages of nuclear power. We are arranged a National Seminar to inform the National Decision Makers about the Benefits of Nuclear Power in the Long-run, during 199; but we are not successful.

We would like cooperation with RCA countries particularly in sharing their experiences with nuclear power. Opportunity to use research reactor facilities in the region would also be appreciated.

4.2 Nuclear Information System

We have become a member of INIS; yet we cannot make full use of it as we still lack link with INIS communication network. Institutional and contacts within the RCA states could help us to better provided with Nuclear information in the present stage. recently, two consignments of INIS equipment has been received and presently installation will take place.

5. Radiation Protection

Establishing a radiation protection infrastructure started in 1993. Preparation of a draft law with the assistance of IAEA experts in now complete.

A final version of Myanmar Atomic Energy Law has now been submitted to Attorney General's Office for review. After this step, the law will be submitted to the law making authority.

On the technical side, training and acquiring equipment is proceeding satisfactorily. In early 1997, a basic radiation protection course was conducted by MAEC for hospital radiation workers in Mandalay. MAEC was also requested for assistance by a foreign radiography firm working for oil and gas industry and was willingly provided. These are indications that progress is indeed made.

Myanmar is working on the IAEA Interregional Model Project on Radiation Protection. The function of this project in fact overlaps with the RCA project RAS/9/018 formerly RAS/9/006.

With the economy opening up and rapidly expanding, radiation applications in industry is emerging. We believe our business of establishing a radiation protection infrastructure would successfully continue.

6. Conclusion

We believe, in the given circumstances, we have done our best to develop nuclear technology in Myanmar and to cooperate in RCA for mutual benefit. We hope we will continue to do better in current projects and also try initiate participation in new and comming programmes.

COUNTRY STATEMENT OF NEW ZEALAND

19TH WORKING GROUP MEETING OF RCA MEMBER STATES, YANGON, MYANMAR, 10-14 MARCH 1997

The New Zealand delegation wishes to thank the Government of Myanmar for its hospitality and the Director, Secretary and staff of the Myanmar Atomic Energy Committee for their excellent work in organising this meeting.

A summary of New Zealand activities during the last year is as follows.

UNDP/RCA/IAEA Joint Project

In NCS and Tracer Technology a New Zealand expert has assisted in the completion of the documentation and training in RTD software. We were pleased provide an expert lecturer at a Regional Training Workshop for NCS in the Paper Industry held in the People's Republic of China. Organisation is well advanced for a Training Workshop to be held in New Zealand in May 1997 on Nuclear Methods in Monitoring Wear and Corrosion in Industry.

Within the Nuclear Analytical Techniques sub-project the project coordinator attended the RCA meeting and the IAEA Regional Workshop in Hyderabad, India. We are participating in an intercomparison study of sediments. Collection of air samples is underway as part of New Zealand's contribution to a related Coordinated Research Programme on Monitoring Air Pollution. Two sampling sites are being used, one for clean air, the other for urban air.

We are pleased that the sub-project on Non-Destructive Evaluation will continue as part of a new RCA project, to be separate from the new joint project. We believe that New Zealand can make a significant impact to this important topic through the expertise of the project coordinator who is the Director for training and certification in New Zealand. Unfortunately he was unable to attend two important planning meetings as the meetings were called at short notice.

Following this meeting, Member States will review the final outcomes of the 1992-96 joint project. We expect the review to show that the joint project has made many significant contributions to the development of the region. It is therefore not only pleasing, but appropriate, that further funding for a new joint project appears to be forthcoming. The new project has some different objectives from previous projects. This is a reflection of the continued maturing of the expertise within RCA and of the changing needs of the region. New Zealand wishes to note its appreciation of the contribution made by so many individuals within the RCA and the Agency to the design and overall strategy of the new project.

Radiation Protection

During the year experts were provided for meetings on Mutual Assistance in the Event of a Radiological Emergency (Manila); on Strengthening Radiation Protection Infrastructures (Sydney); and on Implementation of Basic Safety Standards (Trombay).

Medicine and Biology

New Zealand has not participated in activities in this project during the year.

Agriculture Projects

These projects were in their final stages when New Zealand joined the RCA. The dependence of the region on its primary and secondary agricultural base warrants further activity, provided that there is no duplication of the efforts of other regional organisations that have agriculture as their prime focus.

Nuclear Information Systems

New Zealand remains committed to improving the information flow between nuclear science institutes in the region and to the potential users of nuclear technologies. We therefore look forward to increasing our activities within the new UNDP/RCA/IAEA project.

General

a) Thematic Programmes: New Zealand endorses the steps taken to provide an overall thematic basis for RCA programmes

b) RCA Management Structure: We welcome the endorsement given by Member States at the General Conference meeting to the Report of the Working Party on RCA Management. The supportive response to the Report by the Agency shows clearly the shared commitment to the future goals of RCA and to the infrastructural changes necessary to achieve these goals. However we should not let our consensus on what needs to be done blind us to the difficulties, both financial and organisational, that lie ahead. The path mapped out by the Report deserves rapid but careful implementation. New Zealand will provide all assistance within its means and we encourage other Member Sates to do the same. We also request the Agency to seek innovative ways of working with RCA during the formative phase of a new relationship.

c) New UNDP/RCA/IAEA Project The new project requires an increased commitment to shared ownership of the project by the nuclear institutes represented within RCA and the users of the technology. It is essential that each sub-project is commenced as soon as possible. It is also essential that the initial stages of sub-projects plan the pathway to the ultimate outputs promised, and identify and involve the end users.

d) Financial New Zealand has provided a direct cash contribution to RCA from a Crown Research Institute, the Institute of Geological and Nuclear Sciences. We regret that this has had to be discontinued because of incompatibility between the Agency rules and the operating procedures and the financial requirements of Crown Research Institutes under the New Zealand science funding system. The Agency and the Institute are in the process of discussing ways in which the Institute's staff can continue to make technical/scientific contributions to RCA at similar levels to those carried out previously.

Conclusion

Twenty five years of RCA activities has led to a strong network of research and technological capabilities in the peaceful applications of nuclear science. The contribution of RCA to regional development has been highly significant. New Zealand is confident that RCA will have the opportunity to play a major role in future regional development. To seize those opportunities will require vision, flexibility and careful, constructive change within RCA and its relationship with the Agency and, increasingly with other regional organisations and end users.

Our 25th anniversary is an opportune time to consider and initiate the actions needed to provide a bright future for RCA. New Zealand looks forward to the challenges and opportunities and to continued partnership with other Member States and the Agency.

COUNTRY STATEMENT - PAKISTAN
FOR
NINETEENTH RCA WORKING GROUP MEETING
YANGON - MYANMAR, 10-14 MARCH, 1997

Mr. Chairman, distinguished delegates, ladies and gentlemen,

I wish to take this opportunity to express my warm facilitations on your election as Chairman of this Working Group Meeting. I believe that under your able guidance this important meeting will be successful and will achieve its objectives.

It is my great pleasure to participate in this 19th Working Group Meeting of RCA Member States. On behalf of the Pakistan delegation, I would like to express my gratitude to the Government of Myanmar for its diligent work in planning and hosting this meeting and the warm hospitality extended during our stay in Myanmar.

My delegation is very happy to state that RCA has proved to be an effective and successful instrument of regional co-operation between all member countries in South East Asia and the Pacific over the past twenty five years of its existence and we do believe that it will continue to play an increasingly useful role in promoting peaceful uses of nuclear techniques in the socio-economic sectors in the Member States with an objective to improve the quality of life of the common man in the region.

May I recall that Pakistan has actively participated in the activities of the RCA since 1974 and I am pleased to reiterate our resolve to maintain our active contribution in the future RCA programmes. The summary of activities carried out in Pakistan during 1996 is as follows:-

1. Industrial Projects

Increasing emphasis on the application of nuclear techniques in the industry and environment problems has been laid in Pakistan through the RCA activities under Joint UNDP/IAEA/RCA Project on the Use of Isotopes and Radiation to Strengthen Technology and Support Environmentally Sustainable Development. This UNDP aided Project has progressed well and Pakistan has gained meaningful benefits as a result of it. We are highly appreciative of the donors' interest in this useful project. I would like to reiterate Pakistan's wish in the continuation of this effort in the form of the new phase of the project.

1.1 Non-Destructive Evaluation

Pakistan's industry is gradually showing increasing interest in the adoption of quality control methods and applications of non destructive testing techniques. Some local industries are also making efforts to achieve the stamp of ISO-9000 following the footsteps of leader industries. The impact of good's quality on the reputation, sales and consumer's satisfaction is also being made public by the government mass media. National Centre for Non Destructive Testing (NCNDT) of PAEC is offering NDT services and training and certifying the industrial quality control workers in various NDT techniques. Courses at all levels of proficiency are offered all the year round. During 1996, fourteen courses were held which were attended by 139 participants out of which 105 were certified. Nominees came from 35 local industries and different PAEC establishments. A special feature of 1996 was the holding of the first Level-3 Course on Ultrasonic Testing. The examination for Level-3 was conducted with the help of an Australian expert provided by the Agency under this RCA project. In addition to the regular fields of ultrasonics, radiography, surface methods and eddy current etc., the NCNDT is also offering additional courses on topics like acoustic emission, leak testing, NDT and fracture mechanics, NDT and quality control, and interpretation of radiographs. A proposal has been submitted to the IAEA that the NCNDT can now act as a place where IAEA fellows from other countries can be trained in the field of non destructive testing.

In order to contribute to the aims of RCA its National Co-ordinator from Pakistan visited IAEA Headquarters at Vienna (Austria) to finalise lecture notes on :

i) NDT Appreciation Course for Managers
ii) Ultrasonic Testing of Materials at Level-2

These books will take the shape of standard IAEA publications and will then be used as guidelines and text books for the lecture material for courses held throughout the Asia and Pacific region.

Pakistan Society for NDT (PASNT)

The society achieved registration with the Registrar, Joint Stock Companies, Islamabad and has also attracted over 30 members from government and private institutions.

Publication of NDT Newsletter

This quarterly publication started in September, 1995 and has so far published its issues which are circulated among more than 300 recipients throughout the national industry.

1.2 Tracer Technology and Nucleonic Control Systems

Use of tracer techniques is being made in Pakistan at a good pace. The following studies have been undertaken during the period of the report.

- Dilution and Dispersion Studies

Dilution and dispersion pattern of routine and accidental release of affluents of an under-construction plant was determined for flood season in the Indus river. Technetium-99m and Bromine-82 radioisotopes were used in the simulated field/laboratory experiments in which Dr. J.P.S. Barry, an IAEA expert, also participated.

- On-line Density Profile Determination

On-line density profile determination system, developed for a Chemical Processing Tower of an Industry, was finely tested and handed over to the beneficiary industry. It helps in identifying fault conditions within the shortest possible time. The identification is done through determination of density profile. This computerised system is now in routine operation and the trained personnel of the industry are operating it without our help.

- Leakage Investigations and Level Measurements

Initial work on the leakage investigation in a combined feed exchanger in a refinery and level measurement of the catalyst in ammonia service vessel in a fertiliser plant have been started.

- National Executive Management Seminar

The National Executive Management Seminar on the Application of Nuclear Techniques in Mining Processing Industry was held at NCNDT, Islamabad from 3-5 December, 1996. The Seminar was organised by Radiation & Isotope Application Division of Pakistan Institute of Nuclear Science & Technology (PINSTECH), Islamabad. Thirty nine participants from national industrial sector and technological development institutes/universities attended the Seminar. There were six technical sessions covering Mining & Exploration, Process Investigation, Site Evaluation Studies, Application of Analytical Techniques, Radiological Safety Aspects and Cost Economics of Nuclear Techniques in Industry.

- Expert Working Group Meeting

National Co-ordinator for Tracer Technology and NCS Project participated in the Expert Working Group Meeting on Isotopes and Radiation in Industry and Environment held at KAERI, Taejon, Republic of Korea from 3-4 June, 1996. He presented the country report and distributed Software for On-line Column Scanning developed at PINSTECH among the participants.

- Marine Contamination and Transport Phenomena

PINSTECH has very actively participated in the second phase of the IAEA's new Project "Marine Contamination and Transport Phenomena". In this connection, the National Co-ordinator for Marine Pollution Studies attended the Project Formulation Meeting held at IAEA Marine Environment Laboratory, Monaco and presented the country report. Meanwhile, PINSTECH has effectively initiated shallow marine pollution studies along the coast of Karachi under an IAEA Research Contract. These studies are based on application of nuclear techniques.

1.3 Radiation Technology

Imparting of Transparency to Polypropylene for Fabrication of Medical Disposable Syringes

A problem faced during irradiation of medical sterilisable goods is the lack of transparency in the irradiated polypropylene. Introduction of a nucleating agent during processing has resulted in lowering of haze value in samples when compared to those not having the additive. The transparency may be attributed to early nucleation resulting in reduction of size of spherulites. This consequently increases the amount of transmitted light. Rectification of the problem is likely to promote radiation sterilisation technique to the pharmaceutical industry.

- Indigenous Fabrication of Head Shrinkable Kits for Jointing of Cables

Radiation Technology Laboratory at PINSTECH, Islamabad has developed formulation for radiation resistant fire retardant insulation material. Role of crosslinking catalyst for reducing the irradiation dose required to impart desired strength is being studied.

- Fabrication of Insulation for Radiation resistant and Fire Retardant thin wire

For irradiation of wires, different modes of packing i.e. vacuum packing, heat shrinkable packing etc., and their influence on gel-content has been studied.

1.4 Nuclear Analytical Techniques

Environmental Studies

IAEA Research contract "Monitoring of Pollutants in Environmental Media using nuclear and related analytical techniques" was renewed by IAEA and experimental work is in progress. Sampling and analysis of samples is being carried out and results are being compiled. Professor Tian Weizhi, Director CIAE, visited NAA laboratory, PINSTECH from 1-3 November, 1996 on Expert Advisory Mission for review and implementation of improved Q.A - Q.C Procedures for Environmental Analysis using NAA. National Co-ordinator for Nuclear Analytical Techniques Project participated in UNDP/RCA/IAEA Regional Training Workshop on Application of ISO-25 and other International QA/QC Standards in Laboratories Employing Nuclear and Complimentary Techniques for Environmental Analysis held at Taejon, Republic of Korea from 24 June to 5 July, 1996 and in the third National Co-ordinators Meeting held at Beijing, People's Republic of China from 2-6 September, 1996.

- Geological Studies

Characterisation of various rocks from Northern Pakistan, such as carbonatite, monazite and granite are being performed especially for the rare earth elements, in collaboration with the Centre for Nuclear Studies (CNS) and Radiation Physics Division, PINSTECH. In this regard, more than 200 rock samples have been analysed so far.

2. Medical Projects

2.1 Radioimmunoassay for Hepatitis B Diagnosis

The work started at Institute of Nuclear Medicine and Oncology (INMOL), Lahore to develop reliable robust and inexpensive technique for detection of Hepatitis B Markers for screening programme in the country. Local production of HBs Ag and Anti HBs was achieved. The other markers of HB were not considered cost effective for production purposes. The work for detection of HCV was also started in 1996.

2.2 Nuclear Instrument Maintenance and Repair

Quality control is now accepted as an integral part of routine procedures in the overall programme of nuclear medicine departments in Pakistan. Some seminars have been conducted at the Institute of Nuclear Medicine and Oncology (INMOL), Lahore to familiarize technologists with relevant quality control practices. Situation regarding preventive repair and maintenance has already improved. Three laboratories for repair and maintenance of nuclear medicine equipment have been established by PAEC.

During the period under review IAEA has sent 3 interface cards for utilization with the Gamma Cameras in Pakistan. These interfacing cards are useful because we can use a PC for image formation and reconstruction in conjunction with the PIP software. This is a major break through because it makes us independent of expensive dedicated computers compiled with the Gamma Cameras supplied by various manufacturers. These cards have been tested at INMOL and these will be distributed to other PAEC Medical Centres/Institutions. We still need such interfacing cards for the remaining institutes so as to improve the image quality from existing Gamma Cameras available at our Institutes. The quality control and certification is also being assured in these Centres/Institutes.

2.3 Radiation Sterilization of Tissue Grafts

Freeze-dried radiation sterilized human amniotic membranes are being produced continuously. Since late 1993 the activities of tissue bank were switched over to bone bank. A separate tissue bank has been established. This bank is supplying tissues to the hospitals in and around Hyderabad. This bank has also been supplying amnion grafts to different hospitals in Karachi.

2.4 Strengthening Nuclear Medicine in RCA Countries

In order to impart comprehensive and specialized training to newly recruited as well as in-service technical staff, a one-year Diploma Course in Nuclear Medicine for technologists/technicians was conducted in cooperation with IAEA, from 1st January to 31 December, 1996. During the training programme, the participants were given academic knowledge of the basic subject involved in the nuclear medicine procedure. A detailed training in the field of clinical nuclear medicine was also arranged for the participants.

3. Agricultural Projects

Pakistan is conducting pilot scale studies on preservation of various food materials by gamma irradiation. Pakistan has introduced regulations to control the production and sale of irradiated food. A commercial plant is already in operation at Pakistan Radiation Services (PARAS), Lahore and providing services to industry in radiation sterilization of medical products like plastic vials, syringes, gloves and cotton bandages etc.

Public Acceptance and Trade in Irradiated Food

Acceptance of irradiated food by the consumers is a vital factor in the successful commercialization of food irradiation technology. Consumers' education programmes are of utmost importance for the acceptance of irradiated foods. A number of lectures on the subject were delivered in national and international seminars/symposia. Besides, a number of food processing industries were visited and their technical personnel were briefed about the potential, advantages and the economics of food irradiation technology. As a consequence of our efforts, most of them got convinced and requested for decontamination/hygienization of their raw materials as well as finished products The irradiated potatoes, onions, dry fruits and nuts, fresh fruits (mangoes, apples, bananas) alongwith the unirradiated lots were tested by different consumers. The consumers preferred the irradiated products and scored them higher than the unirradiated lots on the basis of better quality and taste.

- Food Irradiation Regulations

Comprehensive food irradiation regulations, covering all the food in seven clauses, have been approved and published by the Government of Pakistan in a Gazette notification in March, 1996. It is a major step for commercializing food irradiation in the country. Consequent upon the approval of food irradiation regulations in the country all foods are allowed for irradiation preservation on commercial scale.

- Test Marketing of Irradiated Food

- Successful test marketing of irradiated potatoes and onions were made through retail sales after four months storage period.

- 2 tons of potatoes and onions irradiated at 0.1 kGy were introduced at Food and Vegetable Show held at Peshawar. The consumers showed interest in the irradiated samples and 39-45% of the families who visited the Show were willing to buy irradiated products. Information campaign was conducted to provide information to the public on irradiated food.

- One ton each of potatoes and onions irradiated at 0.1 kGy were transported from Peshawar to Karachi and Faisalabad by truck and train in wooden boxes . The results indicated that transporting of irradiated products by train was better than truck.

- A Techno-economic Feasibility of Commercial Food Irradiation in Pakistan has already been prepared and vetted by IAEA Expert Mission.

- Experiments are being conducted to develop analytical methods or label dosimeters to measure absorbed dose in irradiated dried fruits and tree nuts under IAEA CRP.

- Studies have been initiated on the detection of irradiation treatment in beef, mutton, fish and chicken.

4. Research Reactor Based Projects

Research Reactor Utilization

We feel that this project should be more oriented to productive utilization for making economic benefits. The utilization of 10 MW Swimming Pool Reactor at PINSTECH, Islamabad is being done for production of radioisotopes and various research and development activities. The National Co-ordinator participated in the Project Meeting held at Bangkok, Thailand from 24-28 June, 1996.

5. Energy Based Projects

Energy, Electricity and Nuclear Power Planning

Two professionals from PAEC participated in the Regional (RCA) Training Workshop on Infrastructure Requirements and Organizational Aspects of Nuclear Power Programmes held at the National Atomic Energy Agency, Jakarta, Indonesia from 22-26 April, 1996. The workshop not only provided useful information on several aspects of nuclear power programme (e.g. infrastructure and organization for nuclear power programmes, legal framework, manpower development, economics and financing) but also provided an opportunity to know the status of nuclear power programme in different countries of the region.

A six weeks Regional Training Course on Integrated Energy and Electricity Planning for Nuclear Power Development with the Emphasis on the ENPEP package was held at Bangkok, Thailand from 17 June to 26 July, 1996. The main objective of this course was to provide training in the use of IAEA Energy and Power Evaluation Program (ENPEP) package in general and its BALANCE and IMPACTS modules in particular. A two-member team from PAEC attended this training course. The participation by PAEC's team proved to be very fruitful as it provided an opportunity to the members of the team to gain hands-on experience in the use and application of a computer package especially designed to conduct energy and nuclear power planning studies, consequently it helped to strengthen PAEC's capabilities in energy and nuclear power planning. PAEC also provided an expert as a lecturer for this course.

In view of the usefulness of the training courses and workshops on Energy and Nuclear Power Planning held in the past, it is strongly recommended that these activities should be continued in the future as well.

6. Radiation Protection Project

This project is being carried out with the collaboration of IAEA to strengthen radiation protection infrastructure in the country. We stress that the emphasis of the project Radiation Protection Infrastructure be further placed on the operational safety of irradiation facilities.

7. Other Comments

Pakistan is providing training to the scientists from the Region at its Nuclear Institute for Agriculture & Biology (NIAB), Faisalabad, Pakistan Institute of Nuclear Science & Technology (PINSTECH), Islamabad and also at other nuclear medical Centers/Institutes and would like to continue this co-operation so that other countries in the Region could also avail this offer. Pakistan is also keen to send its experts to the RCA Member States for short duration as and when required. Pakistan supports the concept of strengthening of TCDC in the RCA region. Pakistan would be willing to enhance this aspect further in the future.

In conclusion, Pakistan wishes to express its satisfaction on the implementation of various RCA activities in the region. We fully support RCA activities and would like to further promote regional co-operation in peaceful uses of nuclear energy.

HASIBULLAH
RCA National Co-ordinator
from Pakistan

PHILIPPINE COUNTRY STATEMENT

19th RCA Working Group Meeting
Yangon, Myanmar
10-14 March 1997

Mr. Chairman,

Please let me extend to you first my warm congratulations on your election as Chairman of the 19th RCA Working Group Meeting . I am positive that wth you steering this Working Group Meeting, it will be fruitful for all of us.

This year marks the 25th anniversary of the RCA. It is with much pride that we look back at the years past. Our Agreement is acknowledged as a model agreement for regional cooperation. We have blazed the trail for regional cooperation and continue to provide an example. We have, however, always sought to benefit also from the experience of the other regional cooperative agreements. We have not only matured as a cooperation body, but we have also grown in number. From an initial eight member-states we have now grown to seventeen member-states.

The network of cooperation that the Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (RCA) has developed so extensively and has proven to be an effective mechanism by which the region addresses problems of common interest in the peaceful applications of nuclear energy.

This year we also celebrate the fortieth anniversary of the entry into force of the Statute of the International Atomic Energy Agency. I would like to propose that the RCA send a congratulatory message to the Agency on this occasion.

Before I present the highlights of my country's participation in the RCA activities allow me first to make a few statements regarding the following:

The delay in the transmittal to the Member States of the documents for this meeting. I would suppose that there is an important reason for the delay but attending the Working Group Meeting is a serious matter and the Member States should be allowed to prepare for it adequately. To receive the documents much earlier than one week would be always desirable.

We welcome the approval by UNDP of the new Project and wish to actively participate in the activities within its framework. To this end, I am pleased to inform that the Philippines has committed $50,000 towards marine-pollution related studies specifically on the red tide phenomenon.

We wish to pursue further discussions on strengthening the regional RCA Management and also issues related to financial arrangements as resolutions of these issues are expected to lead to an effective management structure.

Allow me now to present the highlights of my country's participation in the RCA activiities.

Agriculture Projects

1.1. Public acceptance and trade in irradiated foods

The Philippines participates in this project through a research agreement. The first phase of the project involved the irradiation of six tons of yellow granex onions and the monitoring of the market for consumer acceptance of the irradiated onions. An irradiation of 20 tons of onions was undertaken this year.

A three-man mission was sent by IAEA to assist in determining the feasibility of putting up a commercial irradiation facility. The Philippines is chair of the ASEAN Ad Hoc Working Group on Food Irradiation established by the SOM-AMAF. The Philippines will participate in the ASEAN-ICGFI Seminar on Food Irradiation which will be held in Bangkok, Thailand, 1-4 April 1997.

Industrial and Environmental Applications

1. RAS/92/003 "Isotopes and Radiation in Industry and the Environment"

1.1 Radiation Technology

Participated in the National Coordinators' Meeting held at the Takasaki Radiation Chemistry Research Establishment, Takasaki, Japan, 11-16 December 1996.

In 1996, 11 Philippine participants attended six (6) regional training events under this subproject: the training courses on electron beam treatment of flue gases, radiation curing, radiation sterilization (regulations and standards), and the regulation and inspection of radiation facilities; the seminar on treatment of flue gases; and the symposium on RVRNL.

We support the recommendation that the projects on Applied Radiation Chemistry of Polymers, Upgrading of Cellulosic Wastes to Useful Products and Radiation Processing for Recycling of Plastic Wastes be included in the new UNDP/IAEA/RCA Regional Project.

We also support the recommendation that Radiation Processing of Indigenous Natural Polymers and Radiation Vulcanization of Natural Rubber Latex be included in the new RCA Project on Radiation Processing of Natural Polymers. We further support the recommendation that the Upgrading of Cellulosic Wastes to Useful Products and Radiation Processing of Indigenous Natural Polymers and Radiation Vulcanization of Natural Rubber Latex be carried out in th e form of coordinated research programs.

1.2 Non-Destructive Testing

Participated in the National NDT Coordinators Meeting held at the Bhabha Atomic Research Center, Mumbai, India on 2-6 December 1996. The Philippines supports the continuation of the activities on non-destructive testing within the framework of the RCA. It therefore supports the proposal of Japan for a five-year extension of such activities. The continuation of this subproject will contribute to the assurance of sustainable development of non-destructive testing and evaluation ability in the region, an ability so necessary for global competitiveness.

Conduct of national training courses, proficiency testing programs, administration of national certification examinations continued to be undertaken. In 1997, it is planned to update and revise (first revision) the national standard PNS-146:1987 "Qualification and Certification of NDTPersonnel.

1.3 Nuclear Analytical Techniques

Participated in the National Coordinators Meeting held in Beijing, China, 2-6 September 1996 which also served as the coordinated research meeting. Also participated in the Regional Training/ Workshop on Applications of ISO-25 at the Korean Atomic Energy Research Institute, Taejon, Korea in July 1996.

The Philippines participates in this subproject through a research contract on air pollution characterization and source identification. Thus, it is part of the network of air monitoring stations in the region suitably equipped for the collection of air particulate samples and follows the standards for analytical quality defined by the program.

The project activities and the implementation of the CRP has provided occasion for the participating laboratories to appreciate the need for QA in the analytical laboratory. Participants were at different levels of conformance to QA standards as defined by the ISO standards. All laboratories made progress towards the implementation of these standards in the laboratory.

Our facilities for trace elemental analysis will be complete soon with the arrival and installlation of our KEVEX 771. It t will soon be possible for us to analyze samples and send inputs to the database for the project. A Philippine fellow is now in Indonesia to do analysis of air filters and other samples at Bandung and Serpong. We plan to hold in July 1997 a national training workshop on "Application of Chemometrics for the Evaluation of Environmental Analytical Data". In this connection, we would like to avail of expert assistance to give some of the lectures for the course.

We agree with the recommendation for continuation of support for this subproject under the new UNDP project. The slant towards studies on transboundary movement of pollutants is of great importance to the region.

1.4 Tracer Technology and Nucleonic Control Systems

The Philippines participated in the regional workshops on application of NCS to coal processing and the application of NCS in the paper industry; the training course on advance applications of isotope technique to water resources and the seminar on the application of NCS to coal processing.

3. Measurement of Marine Contamination and Transport (RAS/8/073)

We are pleased to participate in this project through a research contract which we will be submitting soon.

Medical and Biological Applications of Nuclear Techniques

1. Radioimmunoassay for Hepatitis B Diagnosis

Participated in the National Coordinators Meeting held in Beijing, China, 3-7 March 1997. A national training course on radioimmunoassay techniques designed for junior assayists in private and public hospitals was conducted.

Comparative studies were undertaken on different high risk population groups using the CIAE bulk reagents and correlation of these with commercial kits as well as locally formulated kits using some local components such as purified polyclonals likewise tracer-labelled with I-125.

2. Radiation Sterilization of Tissue Grafts

Participated in the National Coordinators Meeting held at Gold Coast, Australia last 30 September to 4 October 1996.

We welcome the possible establishment of a Training Center on Radiation Sterilization Grafts in Singapore and are willing to participate in the proposed exchange of amnions among RCA countries. We are still awaiting the publication of the Manual on Radiation Sterilization, the draft of which was completed two years ago. We are happy to note the possibility of tranferring the technology to South America.

3. Maintenance of Nuclear Instruments (RAS/4/008)

Participated in the National Coordinators Meeting held in Kyoto, Japan on 30 September -4 October 1997 which coincided with the Congress of Asia and Ocenia Federation of Nuclear Medicine and Biology. . We also participated (2 participants) in the regional workshop on Quality Control of Multi-headed SPECT Systems.

We are pleased to be host to the forthcoming Working Group Meeting on the drafting of a handbook for the Care, Handling and Protection of Nuclear Medicine Instruments on 17-21 March 1997.

There is already a build up in the manpower needed to undertake QA/QC of nuclear instruments but a lot of training on repair and maintenance of SPECT systems as well as the old planar one is still required.

For 1997, field testing of the draft handbook will be undertaken. National training courses for nuclear medicine technologists on QA/QC of nuclear medicine instruments will be conducted.

4. Strengthening of Nuclear Medicine in RCA Member States

We are pleased to note the completion of the seven training modules prepared within the framework of this project. We are now in the process of evaluating the feasibility of putting up a self-standing course to utilize the modules or to integrate these modules into existing national training courses.

We are looking forward to participating in the regional workshop on the development of distance learning material in radiation protection which we hope to include in the modules already prepared.

5. Evaluation of Radioactive Iodine Therapy for Hyperthyroidism

There is satisfactory progress in the research being undertaken within the framework of this project. The study is in its second phase of implementation and in compliance with the agreed protocol as modified during the first coordinated research meeting. Clinical cases are continually being screened, treated, followed-up and included n the study. It is expected that by the next coordination meeting we will have the required number of cases.

Research Reactor, Energy Based and General Projects

1. Energy, Electricity and Nuclear Power Planning (RAS/0/23)

Participated (3 participants) in the RTC on Integrated Energy and Electricity Planning for Nuclear Power Development with emphasis on the ENPEP package held in Thailand 17 June - 26 July 1998. Two cases were studied, a basecase scenario and a nuclear option, by the participants using the ENPEP package. The results of principal findings are embodied in the report.

2. Research Reactor Utilization (RAS/4/011)

Participated in the National Coordinators Meeting held in Malaysia in July 1996. We recommend the extension of this project with the focus on beam utilization.

Radiation Protection

1.1 Strengthening Radiation Protection Infrastructure

Participated in the National Coordinators Meeting (NCM) at the Korea Institute of Nuclear Safety, Taejon, Korea, 24-28 February 1997.

The Philippines participated in seven of the nine activities undertaken within the framework of the Project. We were pleased to host three of theses activities, namely : the Workshop on National Services to Produce Procedures and Guidance on Mutual Assistance on 21-26 January 1996; RCM on the Reference Asian Man Project on June 1996 and the EAGM on Biological Dosimetry at the Philippine Nuclear Research Institute. last 25-29 November 1996.

It is gratifying to note that in the case of the activity on mutual assistance, the recommendations of the workshop prompted tha Agency to take make an immediate review of the operating procedures.. We are equally gratified to note of the positive response of the Agency by way of changes in the standard operating procedures in the field of mutual assistance.

We wish to express satisfaction in the implementation of Phase II and strongly endorse the proposed programme for 1997 as agreed upon during the NCM in Korea. The programme is consistent with the original objectives of the current Phase. We shall be pleased to host the Regional Workshop on Emergency Planning scheduled in November 1997.

We would like to express our strong support of Phase III of this project which is of importance in the regional implementation of approved standards primarily the International Basic Safety Standards. We note that it is broader in scope and is not limited to just infrastructure development but aims for enhancement and harmonization of radiation protection. This sits well with the regional focus on nuclear safety.

Extrabudgetary Contribution

As I have mentioned earlier the Philippines has committed a contribution of $ 50,000 to the new UNDP Project for projects on marine environmental pollution specifically on red tide. This will be in addition to the level of our last year's contribution. The red tide problem is a matter of national interest to the countries affected by such phenomenon. Successful application of nuclear techniques to address concerns in this problem would provide immense support to the development of positive public attitude towards nuclear techniques.

19th RCA Working Group Meeting
10-14 March 1997, Yangon, Union of Myanmar

COUNTRY STATEMENT - SRI LANKA

Mr. Chairman, distinguished delegates and other participants.

Please accept my congratulations on your election to chair the 19th RCA Working Group Meeting.

Sri Lanka held the membership of the RCA since 1972 and actively participated in the programmes of regional cooperation in the past twenty five years. In retrospect Sri Lanka views RCA as a programme that has demonstrated and resulted the following stages of transfer of technology to developing countries.

Stage I	: Creation of an awareness.
Stage II	: Training and assimilation of the new technology.
Stage III	: Application of the technology.
Stage IV	: Proliferation of the know how in a sustainable manner.

On behalf of the Government of Sri Lanka I wish to express our gratitude to IAEA, UNDP, donor countries, national nuclear institutes of participating countries, RCA National Coordinators and RCA Coordinators.

The Government of Sri Lanka has recognised the need of nuclear related technologies for sustainable development and has planned to establish a national centre for this purpose. In the past, the RCA projects were implemented, with limited resources and manpower, available at the national atomic energy authority and through collaborative arrangements with non nuclear research institutes. In fact the directions and the fields chosen for research and development at the proposed centre are those introduced through the RCA Programme in the past twenty five years to Sri Lanka.

UNDP/IAEA/RCA Projects:

Non Destructive Testing (NDT)

The sub project on Non Destructive Testing (NDT) has helped very significantly to develop the NDT capabilities of Sri Lanka and it can be said that this project has passed the above mentioned four stages.

Resulting from this project the country gained by training and certificating nearly 450 NDT personnel in Level I and II. There is a continuing demand for such training. Establishment of the National NDT Society too is an important outcome of the project.

In 1996 Level III certification was initiated with the assistance of the Expert made available through the project. An awareness now exists with regard to non metallic materials and with the help of the regional training made available last year, gaining of NDT capability on non metallic materials is now being planned.

Radiation Technology (RT).

Radiation Vulcanization of Natural Rubber (RVRNL) Technology has also passed the above four stages and the results of the work so far carried out needs the acceptance of the industry to have the full benefits to the end user.

In this connection the need has been recognised to establish a research, development and demonstration facility for this work. Proposals were submitted to the Government to consider as a request for development assistance from Japan or from Germany.

Nuclear Analytical Techniques (NAT).

This sub project too has passed the above four stages and is being continued with the regional training and expert assistance made available. The results are useful to the environmental agencies in the country.

Nucleonic Control Systems (NCS) and Tracer Technology (TT).

The regional training made available to the country was utilised and the sub project coordinator has made efforts to create an awareness on the use of NCS in the paper industry. But the full potential of NCS in paper industry was not yet tapped as the management was not fully convinced about the economic advantages. This cannot be pursued at present as the paper industry which is state owned is now going private and management is in transition.

The national tracer group in 1996 met and identified the problems in which TT could be of help. Further discussions were held at the national workshop organised in connection with the visits of the three experts made available by the Government of Australia. We ar e thankful to the Australian Government for providing such expert assistance and the expert advice helped identifying the areas in which the TT could be of use. As a nation we are confronted with arresting these problems such as soil erosion and salutation even if we quantify the magnitudes of such problems using technologies like TT.

Human Health Projects :

The screening of donor blood for Hepatitis B is made possible due to the assistance from the RCA programme. This project is an example where the benefits have reached the end users; in this case the general public. But the national project counterpart has not yet been able to attempt the same for Hepatitis C as this has not yet been assigned a high priority by the higher authorities.

The Tissue Bank established under the IAEA model project is available for the RCA programme for consideration as a venue for regional training. Sri Lanka is also keen to host regional meetings under RCA project on Radiation Sterilization of Tissue Grafts RAS/7/003. The regional training made available under this project was helpful in implementing the moel project on human tissue banking.

Sri Lanka received distance education for nuclear medicine technologists under the RCA Project on Strengthening of Nuclear Medicine in RCA member states RAS/6/022. This project helped in obtaining teaching material and evaulation of trainees. We are thankful again to the Australian Government for providing useful teaching material and assesors to asses candidates. Sri Lanka propose that this programme be repeated as this will help countries like ours where there are no teaching programmes for nuclear imaging technologists due to the fact that separate teaching facilities cannot be provided for economic reasons for a very small number of candidates even though they are called upon to do a specialised job. This project has proved the usefulness of distance learning for training.

Radiation Protection Infrastructure:

In 1996 we received equipment from the Bhabha Atomic Research Centre (BARC) of the Government of India. The low cost TLD system received with expert assistance is now being used and has helped enhancing the personal monitoring service. We are thankful to the Government of India for providing this useful assistance.

The project RAS/9/006 is helpful also in terms of training of personnel.. The training material that would be developed will no doubt enhance the quality of training on radiation protection and may develop into standards for such training.

Energy Based Projects:

The projects RAS/0/021 and RAS/0/023 and the regional training available is important to Sri Lanka to keep an awareness programme alive in the energy sector. As an outcome of these projects we are continuing a national awareness programme through annual workshops and seminars.

Nuclear Information System :

We have made use of the regional training organised under this project in 1996. This has helped linking Sri Lanka into the nuclear information system.

Conclusion:

In conclusion of the country statement, on behalf of the Government of Sri Lanka we wish to thank the Government of the Union of Myanmar for hosting the 19th RCA Working Group Meeting and express our appreciation and thanks to the Organising Committee for their excellent arrangements and hospitality.

THAILAND COUNTRY STATEMENT

19th RCA WORKING GROUP MEETING

YANGON, MYANMAR

10 -14 MARCH 1997

Mr. Chairman,

First of all, let me congratulate you on behalf of the Thai delegation, on your unanimous election as the Chairman of the nineteenth RCA Working Group-Meeting.

Mr. Chairman,
Distinguished Delegates,

I would like to expess my deeplest gratitude to RCA, UNDP and IAEA for their strong and contiuned support enabling the expansion of peaceful uses of nuclear technology to all RCA member states throughout the past year. I would like to extend my sincere appreciation to the government of Myanmar for the kindness in hosting the meeting with excellent arrangement and warmest hospitality. It is my great pleasure to participate in this improtant-meeting and have an opportunity to meet with all other delegates of RCA member states.

Since the last meeting in Beijing, People's Republic of China, the RCA activities in Thailand has gone through a series of progresses in the following endeavors.

1. INDUSTRY AND ENVIRONMENT

Infrastructure and Immediate Beneficiaries

In support to the Project, there are estalished nation infrastructure supporting RCA regional network of technical co-operation, and the Project's network for co-operation and implementation. They are Natinal RCA Co-ordinator, the Project National Counterpart and the National Co-ordinator for Sub-projects. In addition, there are also 33 dividuals and 10 organizations supporting the nation network infrastructure. At the present, there are 25 immediate beneficiaries in the country.

Nucleonic Control System

Nuclear gauges have been used in many Thai industries including paper industry due to sufficient awareness generated from the Project RAS/86/073. In addition, there have been acadre of engineers well aware of the benefit of the NCS in coal processing.

Tracer Technology

There has been increasing demand for tracer technology both in oil and gas industries. It is expected to benefit the industries by saving shut down time for several million US dollars per year.

In addition, some specific knowledge of qualified expertise e.g. column scaning etc. could effectively utilized sucessfully in the country and could further be provided to other member states through the expert mission and TCDC.

Nuclear Analytical Techniques

The research group is making good progress. The major activites that have been conducted and achieved within the framework of the sub-project which are man power resource development, analytical quality assurance and the RCA Co-ordinator Research Program (CRP) on air pollution.

Nondestructive Evaluation

A core of trained personnel capable of introducing NDE technology for metallic material into new industries will be developed and sustainable at the end of the Project. But the need for assistance from IAEA to national training of NDE personnel level 3 will remain and perhaps increase for a period of time in future. This is becuase of necessity to estalblish local confidence on national qualification scheme to be implemented in parallel with national training courses.

Radiation Technology

There have been ongoing nation activities on RVNRL, radiation sterlization of medical product, radiation curing and upgrading of agricultral waste by radiation. For RVNRL has become a national research topic to which supported by the Ministry of Science, Technology and Environment.

Marine Contaminant and Transport Phenomena

The experiences accummulated from the first phase of the project has enhanced the capability of the core group to conduct our own marine sample collection, analysis and monitoring a wide range of radioactive and non-radioactive contaminants in the Gulf of Thailand. As such, basic training programs on the subject could be further arranged through TCDC mechanism for the region.

2. Agricultural Project

From 1984 to 1991, 911 tons of irradiated food including frozen shrimp, frozen chicken, onion, fermented sausage and mung bean were in the markets in Bangkok and it is expected that the amounts of irradiated will increse very year. During 1995-1996 about 1500 Kg. of sweet tamarind were sold in the markets in Bangkok for market trial. At present, fifty items of irradiated foods have been approved by Thai regulation.

3. Energy Project

Nuclear Energy Planning

The power demand in Thailand is increasing at least 10% per year. However. public acceptance for nuclear option has to be overcome. Other aspect such as waste disposal and financial benefit are also required for further consideration by the governmental agencies.

Research Reactor Utilization

The objective might not fullfil at the end of the project due to the delay of activities in the workplan. Only National Coordinators Meeting was organised in Bangkok during 24-28 June 1996. The other activities, Pre-project Evaluation on Neutron Radiography was postphoned and the fellowship for training in SANS was not available. There was no progress in Regional Coordinated Research Programme on Design and Development of Spectrometer Modules to Enhanced Neutron Beam Research. According to NCM on Research Reactor Utilization, 24-28 June Bangkok, Thailand, Thailand is very please to host Regional Training Course on Shielding Calculation in 1998.

Nuclear Information System

There have been ongoing INIS activities including assessing and compiling the information at OAEP main library.

4. Health Project

Nuclear Instrument Maintenance

From 1995 to now, means of maintenance the machine have been changed rapidly to be the service contract. Many sites of nuclear medicine realize that it is such the better way to enable the continuity of patient service. The most important for service contract is still being in need the appropriate engineering since we are not the production site of machine. So the possible solution is gethering together the machine user for exchanging advance technology and also providing any advice for good perfomance.

In addition, at present there are 15 hospitals and 2 private clinics that provide nuclear medicine services for in-vivo studies, and 9 of these are medical school. Among 15 hospitals, the 10 hospitals are in Bangkok and other 5 are in the rural area.

Radiation Sterlization of Biological Tissue Grafts

At the 18th RCA Working Group Meeting in Beijing,China, 20-22 May 1996. Thailand proposed a Regional Center for Tissue Banking with support from IAEA. It was reported in the Gold Coast, Australia Meeting that Singapore has been designated to be the RCT. However, Thailand has established the tissue bank for more than 18 years, functioning as the regional center. It is training technicians and surgeons for 10 years from Thailand and other countries. The center has worked on behalf of IAEA as an expert in Vietnam,Bangladesh, and Indonesia, also as WHO advisor to Srilanka.

We have sufficient resources, patients, donors and surgeons. We are fully supported by the government . The government funding is also available for the training. Donor material is readily avialable and there is sufficient surgical expertise .

We feel that reputation our center for special expertise and recognition for training suggests reconsideration of Thailand for designation as Regional Training Center for Tissue Banking.

Radiation Protection

According to IAEA/RCA National Coordinators Meeting and Project Formulation Meeting for the Project to Strengthen Radiation Protection Infrastructures (RAS/9/08), Taejon, Republic of Korea, 24-28 February 1997, Thailand is very plase to host RTC on Radiation Safety in Industrial Radiography in 1999 and Plannig Seminar for Senior Planners on using the proposed IAEA System for accident Assessment, Accident Notification and Providing Assistance in 2000.

Conclusion

In conclusion, it is well recognized that RCA Project has provided valuable opportunities for all member states to share our concepts and progressive actions to apply the nuclear technology for economical and social development as well as environmental preservation. In principal, Thailand will support the implementation of all 1997 activities which have been proposed by the national co-ordinators through the nation co-ordinators meetings. In addition, the in kind and extra budgetary contributions from Thailand will further continue for RCA.

COUNTRY STATEMENT OF VIETNAM
19TH RCA WORKING GROUP MEETING
10-14 MARCH, 1997

Mr. Chairman, distinguished delegates, ladies and gentlemen,

First of all, on behalf of the delegation of Vietnam I would like to express my gratitude to the Government of the Myanmar for hosting the meeting with the excellent arrangement and the hospitality expanded to the delegates.

A brief description of the Vietnam's RCA activities in 1996 is given below.

I. ISOTOPES AND RADIATION IN INDUSTRY AND ENVIRONMENT PROJECT (UNDP/IAEA/RCA/RAS/92/073)

This project plays an important role in our activity for promoting the transfer of nuclear technology to industry and for training our technical personnel. For the four years 1993-1996, Vietnam obtained important results of implementing the Project in all its 4 subprojects : NCS and Tracer Technology; Radiation Technology; non-destructive Evaluation; and Nuclear Analytical Techniques. The main activities of these 4 subprojects are as follow :

I.1. TRACER TECHNOLOGY AND NUCLEAR CONTROL SYSTEM

Activities in the field of tracer technology in framework of Regional project RAS/92/073 are carried out by 2 tracer groups: One in Dalat Research Institute (DNRI) and another in the Center for Nuclear Techniques of Hochiminh City (CNT). They have solved different problems of tracer applications: The DNRI applied tracer technique for investigation of sand transportation by using Sc-46 and Ir-92 labelled sand, while the CNT used I-131 and Cr-51 tracers for study of water movement. In February 1996, beside the using Sc-46 labelled sand, the experiment on production of homogenous Iridium Labelled glass tracer were performed. A device for transportation and injection of liquid and suspended tracer materials with activity up to 30 Ci of Ir-92 has been designed and manufactured. The fabrication of this equipment is one of the most important steps for preparing new experiments for the study of suspended sediments in the estuary areas of Vietnam. The National Projects KC/09/06 on "Application of nuclear techniques for study of sedimentation"; " Study of water movement in unsaturated zone and groundwater aquifers in areas of Hochiminh City and

Mekong Delta by means of isotope tracer techniques" and KC/09/07 on " Study of leakage from hydropower dams using isotope tracer techniques" are successfully carried out parallelly with RAS/92/073 and IAEA Technical support.

Nucleonic control systems (NCS) are investigated and applied by the NCS groups at Hochiminh CNT, DaLat NRI and Hanoi INST. Besides the maintenance and repair of the NCS's existing in industrial plants such as in paper mills, cement plants..., the NCS groups designed and produced some prototypes systems for trial use : in framework of National Project, gauges of paper thickness by gamma scattering method, level gauges of water tank by gamma absorption method, level gauges of liquid cans in brewery factories, level gauges by using ultrasonic method were designed and assembled.

I.2. RADIATION TECHNOLOGY

A food irradiation facility of 110 KCi Co-60 source was established in Hanoi under an IAEA technical assistance and has been put into operation in May, 1993. For 1993-1996 the irradiation facility operated approximately 1,500 hours/year for practical application, including: sterilization of surgery gloves, tissue graft, catgut, bottle for vaccine; Sterilization of beat-based carrier for nitrogen fixation inoculum; Mold control for medical herb; Mold and insect control for tobacco leaves. Particularly, in the current year 1996, operation time of Hanoi Irradiation Center reached 2,800 hours and main irradiated products were : 60 m^3 of medical gloves, 60,000 units of catgut, 10 m^3 vaccine tubes, 85 m^3 of traditional pharmaceuticals and 7 tons of rice.

Thanks to the Co-60 source of Dalat Nuclear Research Institute (NRI), laboratory researches have been done for trial production of biocompatible hydrogen from polyvinyl alcol (PVA) and polyvinyl pyralydol for burnt treatment; trial production of slow release matrix by radiation polymerization at low temperature of hydroxyethylmethacrylate for progesterone immobilization etc. Other research was carried out on UV curing, some results have been obtained on synthesis of oligomers and on study of kinetics of UV curing on wooden and aluminium surfaces. In 1996 coating of curing for about 10,000m^2 paper was performed. Research on Radiation Vulcanization of Natural Rubber Latex (RVNRL) is being carried out in Vietnam with the assistance of Japan. This research on RVNRL is no more confined to laboratory. After 2 tons of natural latex had been successfully irradiated using gamma source in Indonesia, several test on pilot scale production of RVNRL have been conducted using Co-60 source of Dalat NRI. At the national level, several countries such as India, Malaysia, China, Srilanca, Thai lan and Vietnam have organized training courses and seminars to disseminate information and kwon-how on RVNRL.

With IAEA technical assistance, the project " Radiation sterilization of health care products" is implementing for 1995- 1998 with the goal to establish a sterilization Center in Hochiminh City. Vietnam Atomic Energy Commission (VAEC) has been trying to accomplish preparation work, including administration procedures and local investment, for the construction of the facility in the this year.

I.3. NON-DESTRUCTIVE EVALUATION

NDE activities in Vietnam are carried out by the three leading NDE laboratories, existing in the Center for Nuclear Techniques Hochiminh City, Institute for Nuclear Science and Technology Hanoi and Hanoi University of Technology. Several NDE centres were developed in government and industrial sectors.

A significant achievement of NDE activity is establish national committees and boards: Campaign Committee for establishment of National NDT Association. National Standard Technical Comitee-135, that is concordance with ISO-TC/135. National Certificate Board (NCB) and National Examination Board (NED).

The second achievement is to issue some NDT National Standards: TCVN-5868/95 (in concordance with ISO-9712 personnel qualification and certification on NDT). 12 other Standards on selected NDT methods were approved and put into operation. In 1996, the TC-135 Committee has just submitted for approval further more 13 Standards on NDT (among them, 11 Standards are concordance with ISO-Standards and other on NDT terminology are in concordance with ASME-Standards)

Firstly in Vietnam, in December 1996, a level III NDT national examination on radiographic method was held in Hanoi with 18 participants, among them 11 person passed it.

I.4. NUCLEAR ANALYTICAL TECHNIQUES (NATS)

Vietnamese standards on environmental quality have been issued and enforced since 1995. Now the use of NATs to support environmentally sustainable development continues to be an important activity in Vietnam. The activity deals with application of NATs in the following field:

1. Application of NATs with high sensitivity and capability for multi--element analyses to obtain the base line data on the concentration of toxic elements and radionuclides in environmental objects (number of sample collected: 250 and number of analyses: 2600). The projects relating to environmental applications of

NAT have been undertaken within the framework of many other national programs.

2. Determination of element (macro-and micro-) concentration in soil, plant, water, food ect. in supporting the sustainable development of agriculture and improving the quality of life. Approximately 2,800 samples of different objects with more than 30,000 constituents have been analysed, which provided the good routine analytical services to customers of many fields.

3. Use of environmental isotopes as indicator to study process in the environment and biology.

Vietnam would like to express the deepest gratitude to UNDP and IAEA for their strong support enabling the expension of industrial uses of isotopes and radiation to all RCA menber states though this project. Vietnam positively and heartily responds to the idea of further co-operations between RCA - IAEA - UNDP in order to fully implement such a large scale project as the new UNDP/RCA/IAEA Project on "*Better Management of the Environment, Natural Resources and Industrial Growth through Isotope and Radiation Technology*".

II. MEDICAL AND BIOLOGICAL APPLICATIONS

Vietnam has been participating in 4 RCA projects in the field of medical and biological applications of nuclear techniques. It should be emphasized that Nuclear techniques have given rise to great impact in the social life, in which there was unquestionable contribution of all activities deployed under the RCA projects on nuclear medicine.

Over the last years, the implementation of Diagnosis of Hepatitis B by radioimmuoassay was promoted. The first time that the RIA technique for viral hepatitis markers has been applied nationally and systematically for screening of blood donors, lineal diagnosis and monitoring of liver diseases, and epidemiological surveys. A strong basis for sustainable performance of RIA and IRMA test for hepatitis and tumour markers, and hormones has been established in our country. Great numbers of RIA tests have been done for hepatitis B markers: 44,910 tests, including 37,110 for HBsAg; 3,998 for anti-HBs; 1,119 for HBeAg; 1,325 for anti-Hbe; 1,358 for anti-HBc. Anti-HCV (236 tests) and tumour markers AFP and CEA (more than 2,000).

For the whole Asia - Pacific region, tissue banking is the area where transfer of technologies related to atomic energy for peace is considered as successful. On May 26th 1996 by decree of the ministry of Health of Vietnam, the Laboratory of Biomaterial Preparation became the Scientific, Technological

& Medical Center of Tissue Preservation (Tissue Bank). Up to now, 21,986 items of grafts were produced including: Bone allografts : 3,335 items, Amniotic membranes: 8,593 items, Frog' s skin: 9,397 items, Pig's skin: 450 items, Duma mater: 210 items. Over 300 patients were grafted by AAA bone in orthopaedic operation. Oven dried and radiation sterilization grafts as a temporary skin cover were used on 600 patients in six hospitals in Vietnam. A quality control was developed encompassing all tissue banking activities, in compliance with the criteria for National Standards TCVN-5202 (ISO-9002).

Project on Nuclear Instrument Maintenance is continued implementing through three main tasks : maintenance, repair, upgrading and quality control of nuclear medical instruments. Two service centers for nuclear medical instruments were established: the first one consists of electronic engineers from department of nuclear electric VINATOM and nuclear medical physicists from Hanoi medical service center. The second one consists of electronic engineers from the center for nuclear techniques in Hochiminh City and nuclear medical physicists from Hochiminh City nuclear medical center.

III. AGRICULTURE AND FOOD

The project *Application of UMMB (Urea-Molasses Multinutrient Blocks) utilization and progesterone RIA techniques for improving dairy cattle productivity in smallholder farm in Vietnam* is implementing. The milk production and reproduction performance were increased considerable (8-10%). The UMMB technique contributes in solving pollution, which is from burning rice straw, bagasses and other agro-industrial by products. Project has supplied to institute some equipment for research and trained a staff of researcher and technicans for dairy industry, especially in UMMB utilization and RIA technique fields.

Vietnam now puts a great effort on the issue of a regulation of irradiation food, a draft of which was submitted to the Minister of Health for approval for irradiated food market development. The project was approved for preservation of 20 onion tons in 1997. Some trials were done with the irradiation of 30 tons of rice. The results are encouraging commercial partners to develop the marketing test in near future.

IV. RESEARCH REACTOR UTILIZATION

Thanks to the research reactor and other scientific tools, the nuclear sector in Vietnam has been able to implement a continuous and oriented research program in nuclear science and technology, and consisting of :

- Research on effective neutron beam utilization : two filtered neutron beams using tangential and piercing horizontal beam tubes have been set up, giving rise to various nuclear reaction and nuclear data studies, and such practical applications as neutron radiography, etc.

- Research on radioisotope and radiopharmaceutical production serving nuclear medicine and other users. Oriented towards efficient use of the reactor, research has led to such products as P^{32} applicators, Tc^{99m} generators and I^{131} solution/ capsules which have all acquired solid confidence.

- Research on analytical techniques based on neutron activation consisting of analytical process elaboration and analytical instrument design and construction. NRI procures analytical services for geology exploration, oil prospection, agriculture, biology, environmental studies, etc. Studies on environment pollution have contributed to implementing the environment control mission of the Government.

- Research in radio biology consisting of applying radioactive tracers for studying biological metabolism, especially nutrition problems. The studies have permitted experimenters to investigate phosphorus absolution and other nutritional problems during the growing processes of rice and other plants. The irradiation effects on some plants have been investigated for obtaining higher yields or environment adapted varieties.

V. ENERGY AND NUCLEAR POWER PLANNING AND NUCLEAR INFORMATION SYSTEM

1. In the frame of *Energy and Nuclear Power Planning Program* the following activities have been performed :

- Participation in the International Seminar on Nuclear Power and Public Information.

- Establishment of co-operation relations with Foreign Counterparts such as: KEPCO, JAIF, CEA, IAEA...

- The National Project has been approved by a national commission and will be also developed in the frame of another national project of the Ministry of Industry, aimed at overall studies on the viability of nuclear power in Vietnam. The National Project of Ministry of Industry will create basis for the government decision to go nuclear.

2. Basing on the closed co-operation with the other countries through the IAEA/RCA projects, the VAEC's Information Center has been creating relation

of information exchange between information center in the Region, especially nuclear literature on requests. The VAEC has gained some benefits for information work from participating in the project such as: creating a guarantee for fulltext services in the VAEC, upgrading skill of personnel of the VAEC's Information Center, establishing in step exchange relations between information centers in the region.

VI. RADIATION PROTECTION

Vietnam is one of the developing countries into which transfer of technology and foreign investments are increasing. Many radioactive sources are imported for different purposes; development of industry in the country also leads to a great quantity of wastes including radioactive wastes. Therefore, the radiation and waste management play an important role in national development plans. Under the co-ordination of IAEA an International Model Project on upgrading radiation protection infrastructure has been implemented.

The Vietnam Radiation Protection and Nuclear Safety Authority (VRPA) was established by the Prime Minister' s Decision No. 389/ TT under the Ministry of Science, Technology and Environment. VRPA has been implementing the activities to manage radiation safety in our country, such as inspection, assessment, license for utilization of radiation, for import and transport of radioactive material. The ordinance on Radiation Safety and Control has been promulgated by the National Assembly on June 25th, 1996.

VI. CONCLUSION

We believe that RCA can and will continue to play a vital role in strengthening the nuclear science and technology capabilities in the region. Vietnam wishes to express its satisfaction on the implementation of various RCA activities so far. Vietnam fully supports RCA activities and has great desire to further promote regional co-operation in peaceful uses of nuclear energy.

(Research Project Proposal for RCA during 1999-2000)

(Plant Mutation Breeding)

China
Institute of Nuclear Agricultural Sciences
Zhejiang Agricultural University
February 1997

(Research Project Proposal for RCA during 1999-2000)

(Plant Mutation Breeding)
Institute of Nuclear Agricultural Sciences
Zhejiang Agricultural University

This proposal includes 4 aspects:

1. Hybrid crop improvement using in vitro biotechnology in connection with mutagenesis;
2. Enhancing Mutation breeding efficiency through molecular biotechnology;
3. Exploring alternative mutagenic sources other than gamma rays
4. Organizing on-job personnel training courses on plant mutation breeding and related fields.

A. Hybrid crop improvement

Objectives: to extend the use of hybrid rice and hybrid rapeseed.

Justification:

a. Growth duration is a very important factor affecting the adaptation of cultivars to certain ecological area. In China, for example, hybrid rice and hybrid rapeseed has well demonstrated high yielding and good adaptability. However, because of their long growth duration, hybrid rice has been mainly planted in a limited area as a late season crop. Few early season hybrid rice are grown in the middle and lower reach of the Yangtze River so far, and it is the same situation for hybrid rapeseed in this area. Therefore, breeding for a new combinations of hybrid rice and rapeseed with short growth duration and high yield potential will change the situation.

b. Plant (both rice and rapeseed) growth duration could be efficiently reduced using in vitro biotechnology in connection with mutagenesis. This has proved to be a effective way in China as well as other areas. We have obtained many early mutants from late season rice hybrid and that might be used to breed new combinations of early season crop.

B. Mutation breeding efficiency enhancement

Objective: to enhance mutation breeding efficiency by improving selection method and better understanding mutation mechanism.

Justification:

a. DNA markers, RAPD, ALFP, microsatellites, have been extensively studied for many important plant characteristics and used in plant breeding practices. Theoretically, DNA marker-assisted selection might also greatly increase the efficiency of mutation breeding.

b. Induced mutation mechanism might be uncovered by using molecular biology techniques and that will be greatly helpful to mutation breeding. Modern molecular biotechniques, such as DNA-marker assisted gene-tagging, cloning and sequencing will finally explicate mutation mechanism at the molecular level, and will aid to find the novel and most efficient mutagenic sources for particular uses.

c. Molecular biotechniques is becoming more and more accessible in common laboratories and will make it incorporated into mutation research.

C. Exploring alternative mutagenesis sources:

Objective: to explore more controllable and efficient mutagenic source other than gamma rays.

Justification:

The mutation induction using gamma rays is reproducible, and is still the main source for plant mutation breeding. Studies has shown that electronic beams from accelerating apparatus had similar mutagenic effect on rice to gamma rays, and showed high repeatability, which might be resulted from its reliable dosage control system.

D. On-job personnel training course

Objective: to bring up and reinforce a large number of qualified mutation breeding technicians in developing countries.

Justification:

Qualified personnel is the key to do good for mutation breeding. There had been several research centers for plant mutation breeders developed by the support of IAEA and related countries, they are able to assure the task for training scientists and technicians in China, the Nuclear Technique Training and Demonstration Center for Agriculture Application in Zhejiang Agricultural University was founded in 1989, and had got lot of supports from the IAEA through 2 TC project (CPR05/05 and CPR05/010) and 1 research contract (4461 RB) in plant mutation breeding. The personnel trained and equipment provided through these projects have made it possible to host 3-5 on-job persons at the one time and hold plant breeding workshops in the future. Further support and guidance from FAO/IAEA are needed.

PROPOSAL FOR A REGIONAL TECHNICAL COOPERATION PROJECT ON YAK PRODUCTION IN THE HINDU KUSH-HIMALAYAN REGION.

TITLE: APPLICATION OF FEED SUPPLEMENTATION STRATEGIES TO IMPROVE PRODUCTIVE AND REPRODUCTIVE PERFORMANCE IN YAK

DURATION: three years (1998-2000)

BACKGROUND: The yaks (Bos grunniens) play a crucial role in the animal husbandry economy of the Hindu Kush-Himalayan and Tibetan Plateau Region. Yaks provide draught power for transportation, milk and meat for human nutrition, and other by-products such as hides and fibre. Yak dung is the only source of fuel on Tibetan Plateau.China has about 14 million head of yaks, which is probably 90% of the world population. Yaks contribute about 15% of Chinese milk requirements and on the Qinghai-Tibetan Plateau Yaks provide more than 90% of milk and 50% of meat requirements for the local people(Long R.J. 1994). However, yak production is facing a critical situation under the traditional management systems. The productive performance of yak and rangeland is decreasing. Average carcass weight of adult yak was 112kg in 1965, but by 1981 reduced to 40kg. Forage yield of native rangeland decreased from 2,607kg/ha (fresh based) in 1980 to 1,399kg/ha by 1990.

Mongolia is the second largest yak raising country following China. It has about 0.7 million Yak distributed mostly in Khangai mountain region.. Mongolian yaks get over 90% of their feed requirement from the native rangeland. In winter, yak lose as much as 25-30% of their liveweight and obtain only 40-60% of required feed daily without any supplementation(Davaa M. 1996).
Bhutan has 30,148 head of yaks and about 90% of its human population live in rural areas and more than 80% depend directly on livestock(Lham Tshering, 1996).

Nepal has 47,735 head of yak including cattleyaks . Yaks produce milk, butter, cheese, meat, leather, hair and transport. Its blood is drained from juvenile vein and fed to weak persons especially in the month of July, August in the Mustang area. People of Himalayan belts raise yak mainly for crossbreeding with Bos indicus and Bos taurus to produce crossbreeds for milk production and draft to transport goods from lower altitude to higher elevation. As a matter of fact, their livelihood depends mainly on yaks raising (Yoshi K. 1996).

India has 25,000 head of yak. The yaks provide milk and meat mainly for people who live in the northeast mountain areas. But its population decrease rapidly in the recent ten years.

PROBLEMS WITH IMPROVING YAK POPULATION

It is quite clear that yak production is a very important component of mountain agricultural system in the Hindu Kush-Himalayan-Tibetan Plateau . However, a major constraint in improving yak production is the poor quality and seasonal shortages of feed available for the animals under the traditional systems of management. One method of overcoming this is to provide supplementary feed, but the cost of most commercially available supplements is prohibitive. An alternative is to utilize locally available agricultural and agro-industrial by-products to provide the nutrients required for yak production. A further problem commonly seen within the region is low reproductive efficiency. In most traditional management systems, improvement of nutrition alone does not elicit the desired improvement in fertility. This is often linked to factors such as failure to separate the offspring from their dams at an approciate time (in order to permit oestrus cycles to resume), and failure to detect oestrus in the breeding females.

PROMISING TECHNOLOGIES FOR IMPROVING YAK PRODUCTION

In China, the use of straw and UMMB has been field tested under farming conditions in several counties of Qinghai-Tibetan Plateau. In yak cows, increased milk yields of up to 15-30% have been recorded, increased growth rates ranging between 20-30% have been achieved, and reproductivity rates are increased from 50% to 70-80%.

Since 1960s the forzen semen of wild yak has been used to improve the production characteristics of domestic yaks and the promising results have been achieved. In some yak raising areas of China, the farmers are eager to buy the frozen semen from nearby animal production extension stations to improve their own yaks because the body sizes of F1,F2 even F3 are 50% to 30% larger than the domestic yak in same age and the milk yield is increased significantly.

OBJECTIVES: The objectives of this project are A)to develop the local feeds resources or other useful products to supplement yaks and B)to use the semen of wild yak of China to improve the yak productive and reproductive performance in the Hindu Kush-Himalayan and Tibetan Plateau Region. IAEA should put all the countries raising yaks in the region together a proposal for establishing a network for the exchange of technology and information related to improve management of yak farming systems to the sustainable development of mountain and upland areas in Asia.

1. To promote exchange of expertise, research results and field experiences between institutes in the region working on the application of supplementary feeding to improve yak productivity and rangeland sustainable utilization.
2. To plan, co-ordinate, monitor and evaluate strategies for field application and extension of supplementation and AI technologies.
3. To train livestock extension workers in the transfer of these technologies to farmers.
4. To demonstrate the procedures and results in a comprehensible manner to rural farmers.
5. To monitor and evaluate the results obtained under actual farming conditions.

This project will coordinate, at the national level as well as regionally, the use of locally available crop residues and by-products for feed supplementation (e.g. Urea-Molasses-Multinutrient- Block <UMMB> and Ammoniated straw) and AI. Simultaneously, management practices related to weaning and oestrus detection will be demonstrated and extended to herders. The results will be monitored using immunoassay techniques. The technologies will be disseminated to wider groups of end-users through field activities.

IMPACT: The improvement of livestock productivity, together with more efficient utilization of locally available feed resources, will have a major economic and social benefit to the rural farmers, leading to sustainable development of mountain and upland areas in the region. Project activities will also help conserve and manage yak genetic diversity.

NATIONAL COMMITMENT: Five countries (China, Mongolia, India, Nepal, Bhutan), which have the infrastructure necessary for contributing to and benefiting from the project, will form a Regional Network. Each country will designate a national counterpart, who together with personnel from livestock development and extension services will conduct training courses for extension workers, establish pilot projects in village farming communities, and promote the transfer of technology to the farmers by organizing hold field days.

AGENCY INPUT: The Agency will provide expert services and funds for assistance with training, extension and technology transfer, equipment for formulation of feed supplementation, and periodical regional workshop for the national counterparts. RIA kits for measurement of hormones, and partial support for pilot projects and field activities.

Proposed Inputs:
(Costing based on participation of ten countries)

	1998	1999	2000
Equipment, RIA kits and consumables	50,000	30,000	20,000
Expert services and technical support (4 m/m year 1 and 2; 2m/m year 3)	60,000	70,000	30,000
Regional Workshop for Chief Counterparts (1 wk x 15 participants)	30,000	30,000	30,000
Technical Contracts (Training courses, pilot projects, field days)	30,000	40,000	20,000
Expenditure on wild yak semen	20,000	20,000	20,000
Total US$500,000	190,000	190,000	120,000

Work Plan:

ACTIVITIES	1998 Q1	Q2	Q3	Q4	1999 Q1	Q2	Q3	Q4	2000 Q1	Q2	Q3	Q4
Regional Workshop	X					X			X			
Supply of Equipment		X	X		X				X			
Supply of RIA Kits/Reagents		X		X		X		X		X		
Suply of semen	X			X		X						
National Training Course			X				X				X	
Village Pilot Project				X				X				
Field Days for Farmers				X			X		X	X		X
Expert Services and Monitoring	X		X		X		X	X				X

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This proposal submitted by

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Improving productivity and reproductivity of dairy cow and buffalo with the aid of on-farm progesterone enzymeimmunoassay
(project proposal)

Dazhi Guo prof.
Isotope Research Laboratory,
Sichuan Agricultural University,
Yaan, Sichuan, P. R. China

1. Justification for the project

There are 1.6 million dairy cows and 18 million buffaloes in P. R. China. These species are the economic mainstay of the small farmers in many provinces and constitute the backbone of the dairy industry in China. However, low conception rate, long sexual inactivity after parturition, poor expression of estrous symptoms etc. resulting in long calving intervals and low milk yield, have adverse effects on both reproduction and production of these animals. In most cases, estrous conception rate of the cows only ranged from 25% to 40% and reproduction rate annually only 35% to 75%. Limited production of beaf and milk cann't meet the increasing need of a country which cantains 1.2 billion population.

One of the approaches for solving the problems mentioned above is to use the milk-progesterone enzymeimmunoassay (EIA) to detect early pregnancy, onset of estrous cyclicity postpartum, and conditions such as silent estrus, anovulatory estrus and ovary dysfunction in cows and buffaloes so as to increase their reproduction rate and production.

Regarding the pregnancy diagnosis in dairy cows, the tradition method is rectum palpation which should be carried out by experienced veterinarians with their fingers at 60～90th days after insemination. Its disadvantages are: discriminating non-pregnancy from pregnancy rather late resulting in a longer intercalving period; contaminating and transferring disease are possible; the work is laborious and time-consuming. During the period of non-pregnancy, the milk yield of the cows will reduce in the range of 5～20 kg per day. If the cow faild to be pregnant for one estrous cycle (generally 21 days), the milk yield will decrease by 105～420 kg. A lot of cows became pregnant only after inseminating 2～5 times, i. e. 2～5 estrous cycle and lost milk 210～2100 kg.

The concentrations of progesterone in cows and buffoloes fluctuate regularly in estrous cycle. When measuring the milk sample taken at the period of 21～24th days after insemination, high or low level of progesterone precisely indicate pregnancy or non-pregnancy of the animals. In recent 20 years, Radioimmunoassay (RIA) and enzymeimmunoassay (EIA) to progesterone have been widely used in determination of estrous cycle, early pregnancy, status of conception, ovary function etc. in dairy cattle and buffalo. Since 1979, studies on early pregnancy diagnosis in cow, goat, buffalo and giant panda using RIA and EIA have been continually carried out in the Isotope Research Laboratory, Sichuan Agricultural University. However, like the other institutes in the world, most assays had to be conducted in the laboratory since some special equipment is needed. Studied for 7 years, an on-farm progesterone EIA was successfully developed by prof. Dazhi Guo in the Lab. For pregnancy diagnosis in cows, the technique has the following advantages: ① It is effective. The accuracy of the diagnosis for pregnancy and non-pregnancy is about 84% and 97% respectively, similar to that conducted in the laboratory using equipment. In point of production, picking out the non-pregnant cows is more important which enable the manager or veterinarian re- inseminate the animal timely so as to shorten the calving intervals. ② It is a quick test. One assay can be finished within 40~ 60 min unlike the regular RIA and EIA which usually last for 4 to 16 h. ③ Early pregnancy can be detected. With the aid of the technique, pregnancy and non-pregnancy can be distinguished 39~69 days earlier than that conducted by traditional rectum palpation. ④ It is simple. The test procedure is easy and the result can be judged by naked eyes without equipment. The apparatus also are simple and cheap. So it can be used in the field. ⑤ It is harmless. Less than one drop of milk from the animal is enough for the assay. ⑥ Technically the reagents including antibodies, enzyme conjugates, progesterone standard, substrate solution and buffer needed in the assay can be prepared in the Lab. The proposal is practicable.

2. Objectives of the project

The progesterone EIA will be used in the following aspects:

2.1. Picking out the non-pregnant cows and buffaloes after insemination so as to re-inseminate the animals as early as possible.

2.2. Monitoring the onset of estrous cycle postparturition, thus enable breeding at the earliest possible time to reduce the calving to conception interval.

2.3. Diagnosing ovary dysfunction. Disorder of ovary function often result in changes in milk progesterone profile which can be detected by using the progesterone EIA thus enable veterinaians take adequate treatments for the animals to save the cost of feeds and manpower.

2.4. Besides, silent estrus can be detected and breeding could be made timely. This is more important in buffaloes.

Accordingly, production and reproduction rate of the cows and buffaloes can be improved and both the farmers and state-owned dairy farms will be benefited from the use of progesterone EIA in the field.

3. Unit of the institution and stuff that will be responsible for the implementating the project.

Unit: Isotope Research Laboratory, Sichuan Agricultural University, Yaan, Sichuan, P.R. China.

Stuff: Dashi Guo, Prof. (Chief investigator)

Faju Chen, Asso. Prof.

Xu Zhang, Teaching assistant, Ms. Sc.

Shuqun Wu, Technician.

1997-2-10

ACTIONS TAKEN TO THE NEW JOINT UNDP/RCA/IAEA PROJECT 1997-2001

(1) End 1995	The draft project proposal was developed by Mr. P. Roberts, the RCA National Co-ordinator of New Zealand. It was discussed at the AGM of experts from seven RCA Member States(Singapore, 2-5 November, 1995) and at the National Counterparts Meeting (Jakarta, 18-22 December, 1995).
(2) 2 May 1996	Draft Project Formulation Framework (PFF) presented to and discussed by RCA Steering Committee
(3) 20-25 May	General discussion and objectives of PFF endorsed by RCA Working Group Meeting held in Beijing
(4) 10 June	Revised version of PFF being in agreement in Working Group Meeting in Beijing (May 20-25) sent for comments from Member Countries. The version addressed to all RCA national co -ordinators and all UNDP project co-ordinators as well as chief technical officer (Prof. Hien).
(5) 21 June	The PFF was sent to Mr. Nay Htun (Assistant Administrator and Director of Regional Bureau for Asia and the Pacific UNDP New York).
(6) 24 June-1 July 1	DDG. Mr. Qian visited to UNDP New York Office.
(7) 26 June	PFF final version (" PFF for the new UNDP/RCA/IAEA Project on Better Management of the Environment, Natural Resources and Industrial Growth through Isotope and Radiation Technology ") included the comments made on previous version was sent to all RCA National co-ordinators and all UNDP project co-ordinators as well as Chief Technical Officer (Prof. Hien).
(8) 9 August	Draft message from R.Kastens/RCA-UNDP to RCA Member States was sent.
(9)14 August	Request by new RCA co-ordinator to all Resident Representative of Missions in Vienna for sending the letter of support to adequate local UNDP office was made with example made by Indonesia.

(10)12 September	UNDP Task Force Meeting: Report by the Chief Technical Officer, New UNDP project proposal, Terminal Report, RCA/GC Meeting were topics of discussion.
(11)18 September	During RCA General Conference the prepared document entitled as " Better Management of the Environment, Natural Resources and Industrial Growth Through Isotope and Radiation Technology" was endorsed without modification. RCA Co-ordinator requested again sending the letter of support to UNDP. Five Member States were further responded.
(12) 21-22 October	SIXTH INTER-COUNTRY PROGRAMME, Consultant Meeting on Draft Regional Cooperation Framework for the UNDP Executing Agencies of the United Nations System, Bangkok, Thailand was held. From IAEA, RCA Co-ordinator and Mr. Jan Lodding were participated. The main objective of the mission was achieved as UNDP committed themselves, under certain conditions, to a new joint UNDP/RCA/IAEA project. Informal talks have already been initiated by the RCA Office to reach a cost-sharing arrangement which would strengthen the chances of ensuring UNDP participation in the programme. Letter of support from 14 Member States were handed to Mr. Stephen Browne, Chief Regional Programme and Policy Division, Regional Bureau for Asia and the Pacific , United Nations Development Programme(UNDP)
(13) October	Mr. Jenkinson's Mission(VidComm, Australia) for video on "Presenting RCA- The Use of Isotopes and Radiation In Industry and the Environment" for Joint UNDP/RCA/IAEA Project
(14) 31 December	Joint UNDP/RCA/IAEA Project RAS/92/073 terminated Terminal Report: UNDP/RCA/IAEA-RAS/92/073-TR was sent from CTO Prof. P. D. Hien, VINATOM, Viet Nam to RCA Office on 20 January. The Report was immediately sent UNDP New York and related persons in the Agency.
(15) 22 January 1997	Letter form Mr. S. Browne to RCA Co-ordinator with Minutes of the Project Appraisal Committee Meeting held 17 January 1997 at UNDP with respect to IAEA Project on Isotope and radiation technology. Five fundamental questions regarding proposed PFF were given to RCA Co-ordinator. Letter of reply was sent on 4 February to Mr. S. Browne.

United Nations Development Programme

22 January, 1997

Dear Mr. Yanagisawa,

Subject: Project RAS/92/073

I wish to thank you for sending me a copy of the draft terminal report of the above project which I have read with interest. I am also sending you a copy of the minutes of the recent Project Appraisal Committee held in the Regional Bureau for Asia and the Pacific last week.

I realize that a decision on future support to the RCA by UNDP is required soon, based on both the terminal report of the just completed project, and the proposal for the new project. However, before such a decision can be made, we have to resolve the following set of rather fundamental issues, which were raised by the PAC meeting: is isotope and nuclear radiation technology the most cost-effective means to achieve all, or even any, of the applications targeted by the project? If so, can these INR techniques become easily and usefully applied by people in different fields, who do not necessarily have a nuclear science background? Are these INR techniques user - as well as environment - friendly? Are there any risks or hazards associated with them.

The draft terminal report does not unfortunately provide satisfactory answers. It confirms that the beneficiaries of our previous projects have been almost exclusively confined to scientists and researchers. It states (p.6 that these technologies still do not find wide public acceptance and that for some IRT applications (e.g. waste treatment, p.36) "the technology has not yet been regarded as generally economically feasible".

/...

Mr. K. Yanagisawa
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It is very important in our regional programme that we maintain the broadest possible views of development alternatives. It is therefore crucial to have some objective assessment of nuclear techniques for environmental monitoring and control purposes, alongside other less sophisticated methods.

It would be most helpful if you could provide further information of these points, including some evidence from sources <u>outside the nuclear industry and research field</u> about the efficacy and value of the technologies.

With regards.

Yours sincerely,

Stephen Browne
Chief
Regional Policy & Programme Division
Regional Bureau for Asia and the Pacific

Minutes of the Project Appraisal Committee Meeting

Friday, 17 January 1997

IAEA Project on Isotope and Radiation Technology

Participants: Nay Htun, RBAP (chair)
Stephen Browne, RPPD/RBAP
Nandita Mongia, GEF/RBAP
Charles McNeill, SEED/BPPS
Hyeo-Kyeong Lee, RPPD/RBAP

The meeting was chaired by Mr. Nay Htun, Assistant Administrator and Director for RBAP, who opened the meeting with brief welcoming remarks.

1. Presentation

Mr. Browne made the following 5 points in his presentation.

1.1 Following approval of the RCF, the submission should be seen as a "programme outline"
1.2 The project conformed to the second major theme in RCF
1.3 Project followed the rather successful RCA project. RCA is an effective network in dealing with nuclear technology matters. Use of isotope and radiation technology for environmental purposes is the main focus of the project.
1.4 Project addresses problems of water pollution, cleaner and energy-saving production processes, and institutional networking.
1.5 UNDP will be funding up to 40-50%. Apart from IAEA contribution, 8 countries are expected to contribute (Japan, Australia, New Zealand and 5 developing countries). The channel of the funding would be both through IAEA and UNDP.

2. Comments

2.1 The chairperson opened the floor by asking for comments. In general the project document was praised for its wide coverage of application possibilities of Iisotope and radiation technology for various environmental purposes.

2.2 Mr. Charles McNeill made a point that there had been consultation in SEED with the Technology Group. While the project document was clearly written by experts, it should state objectively why isotope and radiation technologies were the best and the most cost-effective to address the problems stated. Was the technology the best available in all the applications cited?

2.3 Ms. Nandita Mongia felt there was a need to show why the project should attempt to address so many areas. The appropriate sequencing of the proposed interventions should also be shown.

2.4 The chair person agreed with the points raised by BPPS. Isotope technology is not widely used and is not widely accepted. There was also the concern among environmentalists about nuclear radiation technology: were there any accompanying hazards in its use?

2.5 The large training component was noted. Was this training sustainable? In other words, would these trained remain in their fields so as to make use of their expertise? There should also be a clear expression of the cost-benefit advantages of the technology. Finally, while IAEA had many technical strengths, was it sufficiently strong in the application referred to in the project document.

2.6 In his final remarks, Mr. Browne agreed that objective evidence should be provided to show that the techniques proposed by IAEA were cost-effective and sound. Some of that evidence might be provided by the example of IAEA's activities of marine pollution monitoring and control led in the Mediterranean Sea.

3. Endorsement

3.1 The Chairperson closed the meeting by summing up the discussion as follows.

- BPPS / SEED should provide their written appraisal of the project. (please see the attachment)
- IAEA should provide additional justification for the cost-effectiveness of the technology solutions proposed.
- UNDP might consider more limited support to some of the applications in the project.

drafted by ____________ Hyeo-Kyeong Lee approved by ____________ Stephen Browne 21/1/97

INTERNATIONAL ATOMIC ENERGY AGENCY
AGENCE INTERNATIONALE DE L'ENERGIE ATOMIQUE
МЕЖДУНАРОДНОЕ АГЕНТСТВО ПО АТОМНОЙ ЭНЕРГИИ
ORGANISMO INTERNACIONAL DE ENERGIA ATOMICA

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IN REPLY PLEASE REFER TO:
PRIERE DE RAPPELER LA REFERENCE

DIAL DIRECTLY TO EXTENSION:
COMPOSER DIRECTEMENT LE NUMERO DE POSTE:

4 February, 1996

Dear Mr. Stephen Browne,

Subject : Project RAS/92/073

Reference is made to your letter dated on 22 January, 1997 regarding the subject above. After receiving your letter with thanks , I consulted with my technical officers and prepared an urgent reply to your questions in two ways. One is answer from RCA Co-ordinator to you enclosed as ATTACHMENT 1

On the other hand, UNDP had many questions about relationship between environmental matters and conventional nuclear techniques therefore answer on that subject is made by our technical officer Mr. Parr separately and enclosed here as ATTACHMENT 2. I think it is a little bit of longer story than what I expected but acceptable.

By these attachments, I hope VIP of UNDP personnel increase their understandings on RCA activities. I am also very happy hearing from you if you have further questions. With regards.

Sincerely yours

Kazuaki Yanagisawa

Kazuaki Yanagisawa
RCA Co-ordinator
IAEA

P.S. Personally, your good attitude and co-operation on RCA activities has informed to the two Divisions (UNDP matters and RCA matters dealing by different officers), Ministry of Foreign Affairs , Japan and Japanese Mission in Vienna.

Enclosure

ATTACHMENT 1

Reply to your letter, 22 January 1997 on the subject of Project RAS/92/073

Note:
Key items shown in the proposal of new joint UNDP/RCA/IAEA project are 1. Drinking and other water resources, 2. Marine and coastal environment, 3. Cleaner industrial production, 4. Urban air pollution, 5.Quality control, 6. Technological and information systems, and 7.Linkages with end-users, respectively.

(1)Is isotope and nuclear radiation(INR) technology the most cost-effective means to achieve all, or even any, of the applications targeted by the project?
(Why isotope and radiation technologies were the best and the most cost-effective to address the problems stated. Was the technology the best available in all the applications cited?/Mr. C. McNeill)

Yes.
In principal, the utilization of radioisotopes and radiation (alpha, beta, gamma and neutron etc.) from radioactive sources are very broad in the agricultural, industrial, medical, fields especially in developed countries under the better understanding of cost-effectiveness. The technologies being no cost-effective means should not be used broadly in these countries purchasing rationalistic profits.

How can you detect the a few ppb level pollutant quantitatively existing in your river, sea and sky? Nuclear analytical technique is very good tool for you telling what kind and magnitude of pollutant are being in your environment in cost-effective manner.

In the sea, there are still existing some problems such as algae toxin as shown in the coastal zone in Philippines. To detect the cause of problems and to solve it , the technologies related to isotopes and radiation technology are very useful and in some cases unique one..

The followings are examples for your better understanding of this topics.

Example 1(Tracer Technology(TT) and Nucleonic Control System(NCS) covering items 1, 2, 3, 4, 5, and 6)
TT and NCS have been used widely in developed and developing countries to improve the quality of product, optimize the process, save energy and materials, reduce effluents or wastes, thus reduce the environmental damage. Looking into trends in industrialization of some developing countries the external reviewers are of the opinion that in the near future there will be more interest in these technologies. These technologies are used to analyze the operation of industrial units, to eliminate problems and to improve the economic performance of process. There are thousand of successful case studies that cover a wide range of industrial activities in the field of petrochemical and chemical industries, metallurgical and mineral ore processing, waste water treatment and environmental protection, material construction production and civil engineering.

It is generally accepted that the benefits resulting from TT and NCS applications exceed the cost of equipment and studies at least several fold. Based on a retrospective analysis of the data, it was estimated that the average cost-benefit ratio has been 1:10 in many applications. However in some instances remarkable benefits were derived: example, 1:4500 for leak detection in the petroleum industry, 1:50 for gasification optimization and 1:20 for the coal industry. The benefit from the application of gamma column scanning in small size petroleum refineries is up to one hundred thousand US$ per year, when the cost of equipment is 15,000-20,000 US$ and cost of operation per year is only several thousand US$. The benefit from using a NCS for measuring paper basis weight in one paper machine is up to one hundred thousand US$ per year when the cost of equipment is 50,000-60,000 US$. In this case the important fact is that the pay back of paper NCS is completed in less than one year.

(2)If so, can these INR techniques become easily and usefully applied by people in different fields, who do not necessarily have a nuclear science background?

Yes

In the stage of development of INR, all matters should be carried out by specialists who have well nuclear science backgrounds. Once developed technology transfer of INR is, according my past experience, very smooth and safety differenting from technologies of nuclear power plant. Radiation technology has a long developing history since a discovery of X-ray (100 years ago). The techniques which we are going to apply to new joint UNDP project are almost proven to be cost-effective and environmental friendly.

Example 1 : NDT

Several thousands of NDT practitioners were trained and involved in the NDT&E project and a majority of them is employed in the following industrial and public sectors:

-power generation

-petroleum(refineries, gas and oil pipelines, petrochemical plants, etc.)

-transport(aviation, railways, shipyards, etc.)

-pressure vessels, cranes

-civil engineering(concrete and steel structures, bridges, buildings, dams etc.)

NDT&E techniques are widely used for:

-quality control of fabrication

-safety inspections(periodic and on-line)

-material characterization and special applications(e.g., custom and safety inspection at airports)

Objective opinion of PPAS(Programme Formulation Assessment System consisted of USA,France,Malaysia and Japan convened by Agency) external evaluators.

The external reviewers are of the view that entrepreneurs in these regions have seen the business opportunity in introducing the NDT technique to industry by creating a company providing NDT services. Otherwise the number of training courses and the number of participants would not have reached such magnitudes. This means that the company has been creating employment for local people with higher technical capability. Needless to say, the employment creation for such people with higher technical capability will give a "snow ball " effect to the economy of the country.

Example 2:Radiation Technology
Electron beam curing for wood surface coating installed in Malaysia, Indonesia , crosslinking for cable wire installed in Korea, China, Malaysia, Thailand and Industrial sterilization for medical purpose installed in most RCA Member States were operated by peoples who do not necessarily have a nuclear science background.

(3)Are these INR techniques user-as well as environment-friendly?
(Isotope technology is not widely used and is not widely accepted. Were there any accompanying hazards in its use?/Mr. Nay Htun)

Yes.
I think Mr. Nay Htun is more concerning about nuclear reactor technology for nuclear power plant. Hence, nuclear technology is not used widely in the RCA region and is not widely accepted. However, INR has been used widely in the RCA region and accepted widely, I would like to say. Namely, nuclear energy matter has a different story from radiation technology and isotopic utilization.

Of course there is no substances that have no potential risk to human beings. Radioactive materials naturally have potential risk and sometimes are not good friends to human beings. However, since the discovery of radioisotopes many specialists have been engaged the work how to make them more human and environmental friendly. According to their great efforts now we are in safe for their peaceful and cost-effective use for peoples in RCA region.

Example 1: NDT
NDT&E assure an important, positive impact to public and environmental safety. Elimination of dangerous, non-qualified products, and preventive detection of any material deterioration and damage during operation/use, are the essential objectives of NDT&E applications. But on the other hand, stringent Radiation Safety Rules are respected by industrial radiography operators.

Occupational risk is not something reserved for INR applications only. Occupational risk is unfortunately rather high in modern industry(e.g., in chemical sector, building, transportation, use of gas and inflammables products, etc.). But there is no one institute or area (excepting children and pregnant women presence) in which application of industrial radiography is restricted., providing that adequate safety rules are respected(dose as low as reasonable achievable-ALARA principles). Similarly to medical radiology, for which non disputable advantage of X-ray diagnostic against inevitable risk of irradiation is widely recognized, the public risk involved by non-examined airplane, rail or gas installation is not comparable with controlled, occupational risk run by industrial radiography personnel and sometimes, the member of public-passers-by.

Example 2: TT and NCS
There are several hundred nuclear gauges installed in industry in RCA developing countries, mostly in China, India, Korea, Thailand, Pakistan, Malaysia, Philippines, Vietnam, as direct output of RCA activities under joint UNDP/RCA/IAEA project. The iron and steel processing industries are the major users of NCS. Mineral ore processing and especially coal processing are also large end users of this technology. The paper and pulp industries also use nuclear gauges. Their economical benefits and safety have been demonstrated and recognized by industry as judged form this widespread use(all over the world there are several hundred thousand NCS installed in industrial processing).
The industry demands new techniques for higher productivity, higher quality and energy saving. The request for low cost, easy handling maintenance free and reliable functioning in difficult environmental conditions are met mostly by nuclear gauges.

Example 3 :Radiation Technology(1)
Since early 1960 ionizing radiation have been used for medical, industrial and research purpose all over the world. There are currently close on 200 gamma irradiators and over 800 electron beam facilities in operation worldwide. These are generally used for the sterilization of medical products, preservation of food, synthesis and modification of polymers. The safety records of radiation processing industry has been extremely good, in fact only four serious accidents have been reported in about 1000 facilities so far, Italy(1975), Norway(1982), El Salvador (1989) and Israel(1990).
Gamma and electron irradiators have been so constructed that during normal use any exposure of workers to radiation is extremely low and there is no possibility of exposure to public.

Example 4 :Radiation Technology(2)
In the field of radiation technology to assure the safety control of irradiation facilities, a safety for human being and environment is secured. No use of harmful chemicals in electron beam curing, crosslinking and industrial sterilization makes more friendly environment between human being and environment. Recent publication(September 1996) by the National Institute of Public Health and the Environment, Bilthoven, the Netherlands mentioned on this point (See. Attachment 1). This document can also be used as one of evidence requested to prepare in the subsequent question (4).

(4)Some evidence from sources outside the nuclear industry and research field about the efficacy and value of the technologies.

If I have enough time I am able to provide you such references. Due to urgency of this letter, I would like to show a few examples obtained from outside the nuclear industry below.

Example 1(Radiation Technology covering key items 1, 2,3,5)

In addition to the unmatched technical advantages inherent with the use of gamma or electron beams for the sterilization of health care products, various economic analyses shave also shown that radiation processing is also cost-effective. Please see the report " The Economics of Sterilization" by R.M.Brinston published in Medical Devise Technology, June 1995 page 16. The economical advantages of this technology become even more significant when the through-put rate is increased.
Sterilization unit costs as low as $0.11/kg/25kGray have been estimated for high power electron beam facilities operated at 6,000 hours/year.

Example 2 (Non-destructive Testing and Evaluation(NDT&E) covering items 3,5)
Objective opinion of PPAS external evaluators : Radiography(x-ray and gamma radiography)is the second only to the ultrasonic technique in NDT, and second to NCS in the industrial application of radioisotopes. It is used , with no alternatives, world wide, in various industries such as petroleum, gas, chemistry, fossil and nuclear energy, shipbuilding, aircraft construction and maintenance, and civil engineering.

(5) The large training component was noted. Was this training sustainable?

Yes.
Transfer of well developed radiation technology will be started basically form training the peoples in the RCA region. The trained people will transfer his knowledge and mastered techniques to his colleague in the country. Like this was, human being networking is set up in the RCA region well. This kind of activities has been carried out for 25 years. As you know technology will progress day by day so that training for newly developed techniques can not be stopped to keep the peoples skill in sufficient level.

Joint UNDP project usually use well proven techniques for the purpose of welfare of a great majority of regional peoples, then training course is opened to younger peoples who are new comer to nuclear field and even though to old peoples who are keeping outdated knowledge and skill.

Example 1: NDT
Very intensive transfer of know-how and skill of technologies, for example NDT technique to developing Member States of the IAEA in Asia Pacific(under joint UNDP project) and in Latin American regions(RLA project) during last few years in the form of number of training courses organized , the number of participants trained, and the publication of document(IAEA-TECDOC-628), has undoubtedly proven that the training is sustainable.

Example 2: TT and NCS
Significant progress has been made enabling RCA Member States to introduce industrial applications of radioisotopes in well defined processing fields and to establish national groups with an indigenous capacity to sustain and further develop the required technology. In almost all RCA developing countries there are Created Tracing and Ganging Groups

and some of them (Malaysia, Republic of Korea, China, Indonesia, Viet Nam, India, Pakistan, Thailand) might be considered as Regional Resource Unit to provide training, techniques and support to other RCA countries in several subjects through TCDC (technical co-operation among developing countries.

INTERNATIONAL ATOMIC ENERGY AGENCY
INTEROFFICE MEMORANDUM

TO:	Mr. K. Yanagisawa RCA Co-ordinator	DATE:	1997-02-04
FROM:	R.M. Parr Head, NAHRES RIHU (A2241)	REF:	RAS/92/073
EXT.NO.:	21657		

SUBJECT: Reply to Mr. Stephen Browne's letter of 1997-01-22

This refers to the questions raised in Mr. Browne's letter. I shall confine my comments here to that part of the proposed new Joint UNDP/RCA/IAEA Project for which I am responsible, namely ***Output 1.3: Application of isotope techniques to the assessment of air pollution, particularly its trends and movement in the region.*** I suggest that you copy this memorandum, together with the attachments, and send them to Mr. Browne for his information.

Is isotope and nuclear radiation technology the most cost-effective means to achieve all, or even any, of the applications targeted by the project?

Yes.

- Attachment 1 shows that these techniques have been identified by the U.S. Environmental Protection Agency (EPA) as the method of choice for the analysis of airborne particulate matter collected on filters (which is what output 1.3 will be concerned with).
- Attachment 2 is a review of recent receptor modelling applications in the USA which shows that, in almost all cases, isotope and nuclear techniques were used as the primary analytical tool.
- Attachment 3 is a statement from the China National Environmental Monitoring Center which shows that these techniques are also viewed favourably in China.

Can these techniques become easily and usefully applied by people in different fields who do not necessarily have a nuclear science background?

This is not really the main point because the proposed project is not starting from scratch. The IAEA already has an established network of sample collection and analysis centres in most of the countries of the region. Attachment 4 gives some details. These centres also already have close collaboration and co-ordination with their own national environmental ministries or agencies. In other words, it is proposed here to use an already-existing network of participants who already have considerable experience in this area - together with the necessary national and international contacts.

Within the RCA region, this network already includes the following countries: Bangladesh, China, India, Indonesia, Korea, Malaysia, Mongolia, Myanmar, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Vietnam (together with Australia and New Zealand).

Are these techniques user as well as environment friendly? Are there any risks or hazards associated with them?

It is proposed to use these techniques at centres that are already experienced in using them. Under these circumstances they are user and environment friendly and there are no particular risks or hazards associated with them.

Other remarks

- The proposed project (output 1.3) has recently gained new significance in view of the proposal by the US EPA to introduce new air quality standards, in particular a new standard for PM2.5 particles (see attachment 5). The rest of the world is almost certain to follow the EPA's lead in this respect. Through its already-existing network of collection and analysis centres, the proposed new Joint UNDP/RCA/IAEA project (output 1.3) is in a unique position to obtain relevant data from countries in the RCA region.

- The IAEA has recently made informal contacts with WMO (Dr. J. Miller, Environment Division) with a view to establishing collaboration in this area. Dr. Miller has confirmed that WMO supports the use of nuclear techniques for doing the analyses.

- In the wider area of using nuclear techniques for environmental analyses, the IAEA has agreed to collaborate with UNEP in the implementation of an IAEA/UNEP-REMM Project on Reference Environmental Materials and Methods. UNEP's interest in this collaboration provides further evidence of the fact that nuclear techniques are appropriate and cost-effective for such work.

- Further statements of support may be found in attachment 6.

RMParr/eb 21658

cc:* Ms. Ranharter
Mr. J. Lodding

(* minus attachments)

Documentation submitted to UNDP in IAEA letters in reply to the questions raised by the Project Approval Committee and comments on the Terminal Report

Bersano Begey, M, Cargnelutti, M., Pirastru, E. Groundwater Model for Management and Remediation of a Highly Polluted Aquifer (organo-chlorine compounds) in an Urban Area, using Radioactive Tracers (^{131}I) for Hydrodynamic Parameters and Dispersivity Measurements.

Falter, R., Ilgen, G. Determination of trace amounts of methyl mercury in sediment and biological tissue by using water vapour distillation in combination with RP C18 preconcentration and HPLC-HPF/HHPN-ICP-MS.

Garcia Agudo, E., Leomax dos Santos, J. Experimental Measurement of Turbulent Diffusion, Initial Dilution and T_{90}.

Geertsma, R.E., Orzechowski, T.J.H., Jonker, M., Dorpema, J.W., van Asten, J.A.A.M. Radiation Vulcanised Natural Rubber Latex: safer than conventional processed latex

Hintelmann, H., Evans, R.D. Methylmercury determination by isotope dilution GC-ICP/MS

Hintelmann, H., Evans, R.D. Simultaneous determination of mercury methylation and methylmercury demethylation rates in sediments by GC-ICP/MS.

Hopke, P.K. Receptor modeling for air quality management

International Atomic Energy Agency, Division of Public Information. September, 1995. Isotopes in Water and Environmental Management. Vienna, Austria.

Iverfeldt, Å., Verta, M., Parkman, H., Porvari, P., Munthe, J., Hultberg, H. 1996. Ecosystem turnover of atmospheric methylmercury and mercury in relation to critical load of methylmercury to aquatic environments.

Mee, L.D., and Readman, J.W. Nuclear and isotopic techniques for investigating marine pollution. *IAEA Bulletin*.

Moor, H.C., Schaller, T., Sturm, M. Recent Changes in Stable Lead Isotope Ratios in Sediments of Lake Zug, Switzerland

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Munthe, J., Parkman, H., Lee, Y.-H., Iverfeldt, Å., Hultberg, H., Haraldsson, C. 1996. A stable isotope study of methylmercury production and turnover in forests soils: Methods development and initial results.

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Seiler, K.-P., Behrens, M.W. Use of Artificial and Environmental Tracers to Study Storage and Drainage of Groundwater in the Fraconian Alb, Germany, and the Consequences for Groundwater Protection.

Smith, J.N. Pollution History and Paleoclimate Signals in Sediments of the Saguenay Fjord, Chapter VIII.

US Environmental Protection Agency EPA's Proposal on the Particulate Matter Standard

Wei Fucheng Justification by the China National Environmental Monitoring Center for the use of NAT and PIXE for environmental measurement

NEW JOINT UNDP/RCA/IAEA PROJECT(Draft)
RAS/8/076 "Better Management of Environment and Industrial Growth"

1. Rough Budget (Million US Dollars)

	1997	1998	1999	
UNDP	0.6 +0.3	0.6	0.6	
				Note:0.3 for project formulation
Agency	0.1518	0.149265	0.29943	
RCA	0.3	0.363		(Japanese fund)
	0.242			(Australia funds expected)

2. Sub-themes

There are seven project components

1) Drinking water

2) Marine coastal environment
   *Activities in RAS/8/073 will be continued here.
   *Algae toxin(Philippines), The strait of Malacca pollution
   *Application of Nuclear Modeling Techniques to Sustainable Development in Coastal Zone(Australia fund, No budget is shown now)

3) Air pollution
   *Mr.Parr(T.O.) would make a proposal in form of CRP

4) Cleaner production processes
   *Kume, Japan proposed " Upgrading of Cellulosic Agro-waste to Useful Products "

1997	1998	1999	2000	2001
0.06	0.09	0.22	0.27	0.22

   This was in agreement at 18th WGM, Beijing.

5) Electric networking capability
   *INIS group had project formulation (T.O., Ms. T. Atieh)

6) Improved awareness
   * INIS group had project formulation (T.O., Ms. T. Atieh)

7) Safe -radiation - practices for end-users
   *Australia is proposing "Strengthening Radiation Protection Infrastructure for End-users" , Here 0.242M$ extra-budgetary funds expected.

3. Project Formulation Meeting

April or May 1997

PROPOSED SUB-PROJECT

1. **Title**

Sustainable Nuclear Information Network in the RCA Member States

2. **Participating Member States**

Australia, Bangladesh, China, India, Indonesia, Japan, Korea, Malaysia, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Vietnam.

3. **Background**

Under the project RAS/0/019 on Nuclear Information System that was in operation during 1994-1996, a beginning has been made in building up expertise in, and basic infrastructure needed for, accessing nuclear information. However, the foundation that has been laid during RAS/0/019 should be further consolidated and developed. This will enable scientists and policy makers to access the relevant information needed for R & D, policy formulation, and for creating awareness about the benefits of nuclear technology.

4. **Objectives**

4.1 Improve information services through:
- Human resources development;
- Information infrastructure improvement.

4.2 Facilitate access to scientific and technical information sharing resources in the region.

4.3 Improve awareness of the benefits of nuclear technology.

5. **Expected Results**

It is expected that once the technical infrastructure and the development of human resource has been completed in most of the RCA countries, improved information services and communication technologies in the region will facilitate information gathering and exchange. This, in turn, will foster greater integration of the utilization of information and related technologies in the R & D activities under the RCA technical program and improve coordination and effectiveness of project planning and implementation. The synergy of information and technology will have far-reaching effects on regional and national scales by supporting sustainable development, and providing an environment for better decision-making at all levels, better solution to global and local environmental challenges.

6. Tasks

6.1 Strengthen the telecommunication and other relevant infrastructure in all Member States for rapid and effective exchange of scientific and technical literature as well as public awareness materials.

6.2 Provide training in exploiting the latest development in information technology for information professionals at the national nuclear information centers.

7. Actions

7.1 Provide training, following in the concept of training the trainer on the use of information technology and information handling and dissemination, with the main objective of achieving sustainability in the region.

7.2 Establish reliable and fast connection through Internet so that Nuclear Information Centers in the participating Member States in the region will be in a position to exchange scientific and technical literature speedily (e.g. INIS Non-Conventional Literature). In addition, establish link between those centers and ASTINFO, SISNAP focal points, and other similar regional co-operative projects. This might require delivery of appropriate software and hardware to some RCA Member States.

7.3 Create a Home Page for all RCA activities. This proposed Home Page will facilitate access to up-to date information related to the RCA program. It will also be a useful tool for improving awareness of the benefits of nuclear technology. Preliminary work on this task is already initiated. Attached is the basic structure of the proposed Home Page.

7.4 Once a year, along with the INIS Liaison Officer's Meeting, the national project co-ordinators will meet to evaluate the progress of the various tasks in the project.

8. **Financial Outlay and Activities**

The activities under this project are expected to spread over the period 1997 to 2001. The total estimated outlay is **US$550,000.** The time schedule of activities and cash flow are given in the tables below.

Schedule and Cash Flow

Activities	1997	1998	1999	2000	2001	Total
Infrastructure development - Internet Link (Software/Hardware) - Scanner Technology for Electronic Document Production/Distribution	40,000	50,000	50,000	20,000	10,000	170,000
Training the Trainer - Information Management Skills - Public/Industry/ Government Awareness	–	70,000	70,000	35,000	–	175,000
Expert Assistance (IAEA, Member States)	–	20,000	20,000	35,000	30,000	105,000
Progress Evaluation Meeting	10,000	10,000	10,000	10,000	10,000	50,000
Total	50,000	150,000	150,000	100,000	50,000	500,000
Contingency	5,000	15,000	15,000	10,000	5,000	50,000

Information Technology Transfer Mechanisms

Mechanisms	1997	1998	1999	2000	2001
Infrastructure development	☐	☐	☐	☐	☐
Training the Trainer		☐	☐	☐	
Expert Assistance (IAEA, Member States)		☐	☐	☐	☐
Progress Evaluation Meeting	☐	☐	☐	☐	☐

9. **Intra-regional co-operation**

This method of working is expected to promote technical co-operation among the Member States in the region. Some extra contribution is anticipated from some of the Member States. This could be in the form of equipment, expertise or training activities.

10. **Follow-up**

The progress of the project will be monitored against the project plan. Monitoring will also be done through:

- report of participating countries to the National Coordinators' Meetings
- outputs such as conduct of workshops, establishment of Internet Links, etc.

11. **Success Criteria**

11.1 National nuclear information centers in the Member States will be linked to the Internet and to each other.

11.2 Setting up capability to produce electronic documents.

11.3 RCA Home Page containing up-to date and relevant information about the whole RCA activities.1

u:formplan.doc 28 February 1997

Questionnaire

1. What information about the RCA-programme is of interest to you?
   Please rate 1-5 (5 being lowest priority)

   - ❑ Meetings
   - ❑ Projects
   - ❑ Publications
   - ❑ Training material
   - ❑ Addresses of persons
   - ❑ Country details
   - ❑ Other, ...
   - ❑ Other, ...
   - ❑ Other, ...

1. Please describe your RCA-related activities that would be supported by an RCA Home Page?
   For example:

   - ❑ Organize meetings
   - ❑ Prepare for meetings
   - ❑ Distribute documents
   - ❑ Get information
   - ❑ Other, ...
   - ❑ Other, ...
   - ❑ Other, ...

1. If you are looking for information on RCA, where would you start searching?
   Please rate 1-5 (5 being lowest priority)

   - ❑ on country
   - ❑ on programme or project
   - ❑ on meeting
   - ❑ on training
   - ❑ on time or history
   - ❑ on name of person

1. Are you familiar with Internet Home Pages?

Did you ever browse the Internet yourself?	yes / no
Do you have the opportunity to connect to the Internet from your office?	yes / no
Does your organization have a Homepage?	yes / no

Please provide us with your questions and/or comments on the back of this form!

Terminal Report on
RAS/0/019 " Nuclear Information System"

1. Introduction

The project was approved in 1993 for a period of two years and has been very active from 1994 to 1996. It was envisaged that IAEA would provide the seed funding and the participating Member States would provide additional funding both in kind and in the form of extrabudgetary support. It was proposed that the project should involve the INIS centers in the region and estimated that the regional approach would enhance the sharing of resources among the RCA Member States and facilitate the flow of nuclear information from the INIS centres to all interested parties.

2. Participating Member States

The project started with 15 RCA Member States: Australia, Bangladesh, China, India, Indonesia, Japan, Korea, Malaysia, Mongolia, New Zealand, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam. Myanmar joined in 1995 and Singapore in 1996.

The overall coordination of the project was carried out by the IAEA Technical Officer from the Division of Scientific and Technical Information, in close co-operation with the RCA Coordinator at the Department of Technical Co-operation.

3. Objectives

The primary objective of this initial project was to build a regional system of nuclear information centres that will permit the sharing of information resources. Considering the fact that the nuclear information centres in the various participating countries were at very different levels of development, the scope of the activities was rather wide. It was expected that as a result of this project, countries in the region would be in a better position to provide better information services to their scientists and research workers.

Expert exploratory missions were carried out in several countries in the region in order to assess the level of development, and to recommend additional infrastructure that needs to be added.

One other major consideration in initiating this project was to create an environment to bring about better communication cooperation and information exchange among the participating Member States.

4. **Budget**

The Agency has provided seed funding to allow this initial project to commence. IAEA has disbursed the following amounts:

Year	US Dollar
1994	30,895
1995	86,159
1996	47,170
Total	164,224

The participating countries provided assistance in-kind. In addition, there was a substantial extrabudgetary contribution from India. India hosted a two-week Regional Workshop in 1995, for which the travel and per diem expenses for all the 12 participants from the region were met. India's contribution came to more than US$20,000.

It might be mentioned that the benefit that accrued to the community of scientists and researchers through the close cooperation and collaboration that was built up among the nuclear information specialists is quite substantial even though the expenditure was relatively modest.

5. **Main activities performed**

In order to fulfill the objectives envisaged for the RAS/0/019 Project, the following activities were performed:

5.1 Facilitate access to full-text documents.

A form for document delivery was designed and distributed (Malaysia), and the list of Journal Titles Holdings held at the National Nuclear Information Centres was exchanged among the RCA Member States. The Agency donated BLDSC Coupons to five countries: Mongolia, Bangladesh, Philippines, Vietnam, and Myanmar. Furthermore, the participating countries agreed to accept UNESCO coupons to facilitate purchase of needed literature. These were initial steps toward resource-sharing process in the region.

5.2. Facilitate access to information on translation of non-English literature. Information on the most appropriate reference sources for translations of non-English publication was distributed to counterparts and searches were provided in the World Translation Index for those RCA countries with no online access (Australia).

5.3 Human resources development

Two regional workshops were held in:

i) India, two weeks in 1995 (12 participants); fully funded by India
ii) Malaysia, two weeks in 1996 (12 participants); sponsored by IAEA

In addition, individual training to staff from INIS Centers in the region was provided (Australia 13 person-weeks; India 12 person-weeks; Japan 27 person-weeks). These training activities covered all aspects of INIS output utilization and INIS input preparation, as well as some new developments in information technology. As a result of these activities, the inputs of the receiving Member States as well as the information services provided to the end users are improving; thirteen out of the fifteen participating countries are now submitting input to the INIS databases and some have increased their contribution two fold.

5.4 A brief document about setting up an e-mail facility was prepared and distributed to the RCA Member States with the objective of providing those with no Internet or e-mail facilities with basic relevant information (India).

5.5 Expert exploratory missions to China, India, Indonesia, Malaysia, New Zealand, Australia, Thailand, and Vietnam were carried out to evaluate the information infrastructure and information resources that can be shared in the region.

It was found that for the most part, it is not necessary to build or develop national nuclear information centres but rather to enhance them, primarily through manpower development and resource sharing. The existing national nuclear information centers typically support the present nuclear research facility or government agency and usually have low priority, little funding, too few information technology resources and highly specialized collections. The level of information capabilities in the region ranges from the well-resourced and technology literate to the basic services.

5.6 Mapping of information resources of the nuclear information centres of the participating Member States was carried out (IAEA and Member States). This inventory of the nuclear information centre resources has yielded very useful data which support information technology transfer and will assist in human resources development planning as well as in the evaluation of the type of assistance that is needed to individual Member States. It was found that six of the fifteen national centers do not have online access to their Library's catalogues and eight of fifteen have no access to online databases via international hosts. However, it is of vital importance that in the near future all of them will move towards electronic connectivity through the Internet.

5.7 Fostered mutual co-operation among the RCA Member States in handling nuclear information, such as preparing actual input on behalf of other RCA Member States.

5.8 Three National Co-ordinators meetings were held, in conjunction with the INIS Liaison Officers Meeting, to review achievement and progress of the project. Discussion on all aspects of the project coordination assisted in widening the management experience of the participants and were conducive to TCDC development in the region.

5.9 Equipment and expert assistance were provided to the INIS Center of Myanmar.

5.10 Initial contacts were established with existing information networks in the region, such as ASTINFO and SISNAP, in order to avoid duplication of efforts and for better utilization of existing resources.

6. Conclusions

6.1 Participating countries are satisfied with the project outcome and believe that it has been successful and fruitful. In particular, it has developed strategies and preliminary mechanisms for the establishment of a regional network of nuclear information centres that will allow the sharing of information resources among the RCA Member States.

6.2 The results achieved so far are significant as mentioned earlier especially in nuclear information exchange and human resource development .

6.3 The inventory of services and information resources as well as the expert mission evaluation indicated the wide variation in infrastructure facilities and status of communication technologies existing in the countries in the region. It was also recognized that the achievement of technology transfer was contingent on the ability of people to use this complex technology. Therefore, special attention was given (and should continue to be given) to human resource development.

6.4 One very positive aspect is that we have used exclusively on-the-job training and regional workshops as vehicle for building up the capabilities of information specialists in Member States. Whenever appropriate experts from the region were utilized.

7. Recommendation

7.1 The achievements of the RAS/0/019 Project provide a sound foundation of skills and infrastructure upon which we should continue to build, in order to ensure long-term sustainability at the national level and facilitate regional harmonization.

7.2 It is strongly recommended that a new project should be introduced in order to enhance co-operation among Member States and to further develop information infrastructure in the countries of the region.

7.3 Within the limit of the budget available, the emphasis of the new project, in addition to the regular fields such as INIS input preparation and utilization of INIS output products, should be focusing on establishment of an accessible, stable and sustainable communication and information infrastructure to increase effectiveness of information exchange among the RCA Member States.

7.4 The Internet is considered to be the technology for electronic access and dissemination of electronic information, documents, images and messaging between scientists and governmental organizations in a geographically remote region. For such an electronic nuclear information system to be successful, national infrastructures will need to be enhanced through training, equipment, technologies and cooperative agreements in a sustainable way.

7.5 An electronically-based nuclear information system must provide layered services with equitable participation from all countries. IAEA coordination and involvement would be needed until regional sustainability could be ensured.

7.6 Cooperation and collaboration with existing regional organizations and projects should be encouraged as they would be important and necessary to make the most efficient use of resources, to realize the benefits and meet the needs of sponsoring government agencies.

7.7 The electronic nuclear information system to be developed in the region should meet the requirements of the RCA Member States, suc as for governmental interests for political and media information, industrial research interests for competitive information, the interests of scientists to further the knowledge and transfer of nuclear science and technology as well as the interests of information providers.

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Copy A

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RCA Countries' Data on the Services and Information Resources available at their Centres

Information extracted from the *Questionnaire for the Survey of Information Resources of the Libraries or Information Centres in Asia and Pacific Countries*

[Status of Responses: 20 May 1997]

Country	No. of staff	Library/ information centre collections	CD titles	Information services	Equipment available	Library's catalogue online	Access to online databases via international hosts	Access to Internet	Branches
Australia	4.7	2000 journals/700 curr 50,000 books 8 CD titles 700,000 reps/pats/stnds 50 maps	ILI Stnds Infodisc INIS CFR-Title 10 Business Who's Who of Australia TSCA Chem Sub Inventory New Scientist ACEL Stnds Index Plus MEDLINE Stnd COMCAR Database	very well advanced	13 PCs: 486 or Pentium 2 Notebooks, 1 CD tower, 24 drives 3 photocopiers 7 printers (2 laser) 2 fax machines 1 mfiche reader-printer 1 mfilm reader-printer 1 mainframe computer	yes, books and journals on in-house system and Internet; reports and standards on in-house system	yes, via DIALOG, ESA, Orbit, STN, IAEA, AusiNet	yes, via NSWRNO, email, WWW, FTP, Telnet, Gopher, UseNet (a 2MB microwave permanent link)	no
Bangladesh	8	175 journals/145 curr 10,021 books 3250 reports		basic	1 PC 386 1 photocopier 1 dot matrix printer 1 dot matrix printer	no	no	no, lack of adequate telecommunication facilities at the establishment, a dial-up email link available now	no
China, PR	46	1000 journals/310 curr approx 50,000 books 2 CD titles 600,000 reports, 2000 standards approx 200 video cassettes/films 170 maps		advanced	5 PCs 586, 6 PCs 486 7 PCs 386, 6 PCs 286 4 photocopiers, 1 fax machine 8 printers, 4 CD-ROM drives 4 video player/recorders 2 DtP systems, 1 mainframe 4 mfiche reader-printers	planned	yes, via Dialog, STN	yes, email, WWW, FTP (dial-up link with modem, and network connection through router and modem, to CAnet; 9600 bits/s)	6
India	145	1700 journals/1700 curr 110,000 books 825,000 reports 3200 patents 15,500 standards 1000 theses, 9 CD titles 100 video cassettes 50 audio cassettes 1000 maps	INIS MEDLINE BIOSIS ISMEC AGRIS INSPEC PC-PDF Chemical Abstracts ASTM Standards [plus Curr Contents Diskette]	very well advanced	10 Pentium PCs 11 PCs 486, 17 PCs 386 7 CD-ROM drives 10 photocopiers 1 fax machine, 10 printers 10 mfiche reader-printers 2 mfilm reader-printers 1 mainframe, 1 photo-typesetter 5 video player/recorders, 2 DtP systems facilities to make slides, transparencies, etc.	yes, books	yes, via Dialog, STN	yes, dial-up link to ERNET, email, FTP, Telnet, UseNet (9600 bits/s)	50

Country	No. of staff	Library/ information centre collections	CD titles	Information services	Equipment available	Library's catalogue online	Access to online databases via international hosts	Access to Internet	Branches
Indonesia	16	717 journals/82 curr 9950 books 312,603 reports 296 patents 20 standards 193 theses 22 CD titles 54 audio-cassettes 8 maps		well advanced	1 Pentium PC 1 PC 486 6 PCs 386, 1 PC 286 1 photocopier 3 printers 1 fax machine 2 CD-ROM drives 1 mfiche reader-printer 1 mainframe 1 photo typesetter	no	no	yes, email, dial-up link to VisionNet, email, WWW, FTP (33,600 bits/s)	no
Japan	27	1300 journals/1200 curr 37,000 books 2,110,000 reports 200,000 patents 8100 standards 19 CD titles 43 video cassettes	INIS, INSPEC Nucl Sci Abstr Chemical Abstracts MEDLINE Engin Info Tech Index SCI Science Citation Index SCI Journal Citation Rep BUNSOKU (Curr Bibl Sci Tech) Boston Spa Conf Waste Management Proc Word Wide Standards Index Am Nucl Soc Standard JPO (Japanese patents) J-BISC (Japan MARC on Disc) N-BISC (Nippon MARC on Disc) CD-HIASK (Asahi Newspaper) Rika Nenpyo (science statistics) Kaishya Yoran (Japan Company Dir)	very well advanced	23 Pentiums, 24 PCs INTELDX4 1 PC 486, 2 PCs 386 1 Mac's PowerPC 5 photocopiers 4 fax machines 20 printers, 27 CD-ROM drives 4 video player/recorders 1 mainframe computer 4 mfiche reader-printers 1 mfilm reader-printer	yes, books, journals, reports	yes, DIALOG, STN	yes, email, WWW, FTP, Telnet, network connection through router and modem to StaNet and IMNet (more than 128,000 bits/s)	7
Korea, Rep	16	2280 journals/960 curr 55,600 books 624,000 reports, 7 CD titles full set Rep Korean patents good standards collection Vendor Catalog (cartridge)	INIS, NTIS Energy & Environ DOE Energy & Tech CAP's (US Patent, Curr) Index to Sci & Tech Proc 1991-95 CAT CD 450	well advanced	4 PCs 586 16 PCs 486 1 CD-ROM tower (48 drives) 2 photocopiers, 1 fax machine 16 printers, 4 mfiche reader-pr 1 Challenge L Workstation	yes, books, journal titles, reports	yes, via DIALOG, JOIS, STN, INIS-RS, LEXIS/NEXIS,	yes, email, WWW, FTP, Telnet, Gopher, UseNet, a network connection through a router (1.544Mbps) to KreoNet	no
Malaysia	27	417 journals/100 curr 15,000 books 18,600 reports 1000 patents, 1000 standards 200 theses, 2 CD titles		well advanced	2 PCs 286 3 PCs 386 3 PCs 486	no	no	yes, email, WWW, a dial-up link, http://www.mint.gov.my	1

Country	No. of staff	Library/ information centre collections	CD titles	Information services	Equipment available	Library's catalogue online	Access to online databases via international hosts	Access to Internet	Branches
Mongolia	55	1100 journals/141 curr 24,000 books 3500 reports 1.8m patents 670 theses 16 CD titles 100 video cassettes/films	ECECDB INIS, NUCOS UNEBIB, AIDS HEBDIB IBEDOCS ICOMMOS DARE, ENERGY CFE, MB, LW NGM, WAS	very well advanced	2 Pentium PCs 5 PCs 586, 4 PCs 486 3 PCs 386, 12 PCs 286 4 photocopiers 1 fax machine, 7 printers 7 CD-ROM drives 1 video player/recorder 1 mfiche reader-printer 3 mfilm reader-printers	yes, whole collection available online through internal network, planned to put on the Web in 1997	no	yes, email, WWW, Gopher (dial-up link to Magicnet.mn, 28,800 bits/s)	5
Myanmar	22	1176 journals/11 curr 16,668 books 244 reports		basic	1 PC 486 1 printer	no	no	no	no
New Zealand	1.5 + 2 contract workers	2133 journals/397 curr 2798 books 1357 reports 48 standards 30 theses		very well advanced	1 PC 386 1 PC 486 2 VT100 terminals 1 photocopier 1 fax machine 1 CD-ROM drive 1 printer 1 mfiche reader-printer	yes, all (books prior to 1983 avail on WWW)	yes, via Dialog, ORBIT, Canadian National Network	yes, all, a permanent link available entire day	4
Pakistan	37	1475 journals/150 curr 33,000 books 1m reports 460 theses 2 CD titles 100 video cassettes/films	INIS NTIS	very well advanced	1 PC 486 5 PCs 386 1 PC 286 1 Sun Workstation (SPARC 40) 4 photocopiers 1 fax machine 5 printers 3 CD-ROM drives 3 mfiche reader-printers 1 mfilm reader-printer 1 Offset printer 2 Tradels, 1 OCR scanner	planned	planned	yes, email, WWW, FTP, Telnet (a dial-up link to Pakistan Telecomm Corp, 9,600 bits/s)	no
Philippines	3	300 journals/137 curr 4819 books 408 reports 72 theses 2 CD titles	INIS HealthRom	basic	1 PC 286 1 PC 486 2 CD-ROM drives 1 mfiche reader-printer 2 printers	planned	no	planned, another division has Internet access and a dial-up link, pnri@max.ph.net	no

Country	No. of staff	Library/ information centre collections	CD titles	Information services	Equipment available	Library's catalogue online	Access to online databases via international hosts	Access to Internet	Branches
Singapore	4	640 journals/540 curr 8400 books 2 CD titles 926 video cassettes 16 audio cassettes 8 maps		advanced	3 PCs 486 w/16MB & 420MB hard disk (1PC) 250MB (1PC) 210 MB (1PC) 2 PCs P/133 w/ 16MB & 2GB hard disk 1 photocopier 1 fax machine 2 printers 2 CD-ROM readers 4 video players/recorders 1 mfiche/mfilm reader-printer 2 video-CD players 2 tape-slide projectors	yes (books, journals, reports) to all libraries in Singapore (SILAS)	no, it is linked	yes, email, FTP, Telnet, WWW, a dial-up link (28,800 bits/s)	no
Sri Lanka	6	8 journals/0 curr +4000 books 5 theses 1 CD-ROM title 10 video cassettes 1 map	INIS	basic	1 Pentium PC 1 CD-ROM drive 1 fax machine 1 printer 2 photocopiers 1 video player/recorder 1 mfilm reader-printer (defective)	no	no	lobbying for Internet connection, EUDORA email service available	no
Thailand	8	300 journals/200 curr 10,500 books 240,000 reports 300 standards 75 theses 2 CD titles 20 maps		advanced	2 PCs 486 1 CD-ROM set: 4 drives 1 photocopier 1 fax machine 1 printer 1 mfiche reader-printer	planned	no	planned (with 2400 bits/s)	no

Country	No. of staff	Library/ information centre collections	CD titles	Information services	Equipment available	Library's catalogue online	Access to online databases via international hosts	Access to Internet	Branches
Viet Nam	10	50 journals/25 curr 4000 books 1500 reports 1 CD title	INIS	advanced	2 PCs 386 2 PCs 486 3 CD-ROM drives	yes, journals and library catalogue?	no	planned	4

TAtieh/eva+rf [u:rcatable.doc], 1997-05-22

RCA Home Page Prototype

Planning paper

Objectives

To develop a comprehensive RCA Home Page Prototype which provides pertinent and valuable information for Member States and organizations necessary to their responsibilities and obligations as RCA members ; furnishes introductory and informative material to non-members; and gives general background information about the RCA system for users in general .

Strategy

1. To use existing written materials and electronic documents available in IAEA and RCA Member States and organization to minimize reinvestment of staff time and resources in developing materials for the Home Page ;

2. To involve RCA staff and Member States and organizations in content discussions to ensure that all important aspects of the RCA system are included in the Home Page;

3. To review and evaluate existing United Nations and IAEA as well as RCA Member home pages and others on the World Wide Web (WWW) which are similar in subject and interests to RCA, learn from them, and implement features and programming techniques which are commonly acknowledged on the Internet as accepted methods and approaches for traveling through the network.

Goals

1. To develop a prototype to Member States for initial review and feedback;

2. To implement the RCA Home Page in a manner which reflects significant involvement by Member States in its development .

3. To identify, agree on, and organize the basic content and approach to the RCA Home pages as well as linkages within the Home Page and to other existing relevant Home Pages before implementation begins;

4. To improve the image of RCA Programme by providing information to the public, authorities and counterparts in Member States as well as to IAEA staff dealing with the RCA Programme. In detail, it would include:

5. Objectives and contents of the RCA Programme in general;

6. Nuclear technologies utilized in RCA Programme;

7. Past activities within the RCA programme;

8. Individual successful RCA activities or projects in the form of articles, as done currently in the Inside RCA leaflets and in RCA fact sheets of model projects.

9. To inform RCA counterparts, national authorities in Member States about the IAEA procedures in dealing with the Agency related to various RCA Programme components,

10. To streamline the communication between the Agency and Member States by reducing the communication time, forms, paper flow and number of queries.

11. To maintain links to other useful RCA related Internet data sources in the IAEA Web or in external Internet services.

12. To display and/or provide utility for valuable and necessary information of use to RCA members, including full text documents, database access, etc;

13. To organize and display the information in such a way that navigation through the RCA Home Page and links with other relevant home pages and information is logical and intuitive for users;

14. To organize the information in such a way that individuals, as well as countries , are empowered to access and use the RCA System ;

Considerations/Issues

1. The United Nations and IAEA have Home Pages as do some Member States and other organization related to RCA; the RCA System Home Page design and implementation should factor in these existing Home Pages and link to them and should also link to future Home Pages implemented by RCA Members.

2. In addition to technical computer expertise , skill and knowledge in HyperText Markup Language (HTML) coding is required for implementation and maintenance of the Home Page.

3. Information available on the Internet/World Wide Web is publicly available; therefore, information placed on an RCA System Home Page should be evaluated for its confidentiality, integrity and availability to the general public prior to being put on the Home Page. Appropriate Security mechanisms should be put in place.

4. Serious consideration needs to be given to which products and services are placed on the WWW, particularly in light of the current cost recovery program and corporate regulations .

Contents of RCA Internet pages:

A brief analysis was carried out about potential items for the contents of the RCA Internet pages. The requirements analysis to be carried out would refine the contents and specify the order of implementation. Proposed items include the following:

1. Description of the RCA Programme in general.

2. RCA annual report summary

3. "Inside RCA" leaflets and fact sheets about model projects.

4. Articles written about RCA System.

5. Description of the activities of RCA Implementation

6. Links to other sources inside IAEA: Board documents, public information materials.

7. Electronic forms for RCA Project requests, vendor registration, experts personnel history.

Statement of work

1. Acknowledge the information of RCA such as its history , its Member States , its meeting , and so on.

2. Acknowledge the network, hardware and software requirements of Member States.

3. Define user requirements for development of RCA Internet pages.

4. Acknowledge the database and programming software layout for IAEA Homepage

5. Design structures, navigation and graphical layout for pages.

6. Design security features for the information as applicable.

7. Specify order of implementation and a project for the proposed contents.

8. Implement a prototype for the proposed contents.

Questions:

The following questions need to be provided resource or material.

Customers:

Who are customers of RCA HomePages?

- RCA-Coordinator
- Others?
- Member States
  - Missions
  - Nuclear Institutes
  - others
- Others
  - Universities?
  - Other UN organizations?

Organization:

1. What is the history of RCA?
2. Nature
3. Mission
4. Secretariat
5. Member States
6. Membership
7. IAEA Support
8. Donors
9. Evaluation

Annual Activities:

Meetings

1. Planning
2. Invitation
3. Member States and Persons
4. Time & Schedule

5. Lectures
6. Publishing
7. Conclusion

Programmes

1. Industry
2. Food & Agriculture
3. Energy planning
4. Human Resources
5. Medical
6. Others.

Summary

Process:

Planning & coordinating.

Meeting(Planning, Meeting, invitation, proceeding etc

Publishing(technical documents, Meeting paper, Project papers, Trainnig documents)

Training

Others?

* *Technical & organizational requirements*

Physical infrastructure

Hardware.
Network

Software

Browser
Server

Database
Program Language

Procedures & Guidelines

Registration
Information Update
Security

What other source inside IAEA does RCA need to link to ?

****How about the Technical Condition of each Member State ?***

Hardware
Network
Software
Browser

How Long can the feedback information be return to me in order that I make my project plan schedule?

****How does the member of RCA Search for what they want in their usually working ?***

Navigation

on country

on program

on process(meeting, trainning)

on time , on history

on customer

Fellowship - Programme of Training

Mr. Zou Yang
15.1 1997 - 15.7 1997
NESI, Computer Service Centre

Introduction

More than 30 years ago, the IAEA, India and the Philippines came together under a three-way agreement to jointly operate an Indian neutron diffraction machine in the Philippines. Other inter-country activities on nuclear technology applications followed. Their success begged the question: why not develop a structure for promoting inter-country collaboration?

So the first Regional Co-operative Agreement (RCA) was formalized in 1972, involving the Agency and eight countries of the Asia and Pacific region. Now there are 17 countries in the RCA, and this model of collaboration - a pioneering approach in the United Nations - has been replicated in two other regions: first in Latin American (ARCAL), then in Africa (AFRA) in 1990. Now, the region of West Asia is preparing to set up a similar alliance.

The IAEA has an unusual role in these compacts. It is typically a partner in projects, which run the gamut of nuclear applications in agriculture to industry to energy, hydrology and health. But the Agency is usually not a party of such agreements. Though TC funds help initiate and support projects and the Agency is a conduit for additional resources, all projects are owned and run by regional partner countries.

A key indicator of regional ownership of projects is that country partners pay for them not just by in kind contributions of personnel, materials, services and the like, but in hard cash. More than a third of the cash funding for RCA activities now comes from members, the rest from donors elsewhere and TC in roughly equal shares. The concept of Technical Co-operation among Developing Countries (TCDC) is an ever prominent feature of the regional co-operative agreements, by which many advanced countries in the region assist the less-developed in the region in specific activities.

As discussed at the 3rd RCA National Coordinator's Meeting for the "RAS /0/019 Nuclear Information System" in Kyoto, Japan 3-4 June, 1996, some countries will take responsibilities for different tasks as RCA Regional Resource Units. China will take the responsibility for designing a prototype of a RCA Homepage with assistance from the IAEA.

The fellowship training of Mr. Yang Zou is aimed at his project and the trainee will mainly contribute his effort to the project after the fellowship training.

Training

Scope

Training in the field of methodology and software design for an Internet Homepage with emphasis on an RCA Homepage

Objectives

- To create an RCA Homepage prototype

- To gather knowledge on professional software development
- To gain experience with Web development tools
- To broaden insight in Internet Services development

Plan

To cover the above scope and meet the described objectives the following initial plan has been developed. This plan will be adapted during the course of the Fellowship in order to allow for new developments to be incorporated and/or adjust to the progress made by Mr. Zou during next months.

The development of the RCA Homepage Prototype will be developed in close cooperation with the IAEA RCA Coordinator Mr. Kazuaki Yanagisawa, with which regular meetings will be held.

The coaching function for Mr. Zou will be performed by Ivan Kurtev, under supervision of Mr. Joep Winkels.

To gather knowledge on professional software development	To create an RCA Homepage prototype	To gain experience with Web development tools	To broaden insight in Internet Services development
Fact gathering concerning RCA		Tool inventory	Self-study (Books, Internet, IAEA documentation)
Requirements analysis		Tool evaluation & selection	Exposure to IAEA Web development teams and projects (ADPI, INIS, SDS, TC and others)
Functional analysis		Tool procurement & installation	
Design of prototype			
	Building of prototype	Tool usage	
	Release of prototype		

A monthly status report will be written by Mr. Zou and commented by Mr. Kurtev and Mr. Winkels

PROPOSED IAEA Coordinated Research Project (CRP)

Project Title : APPLICATIONS OF NUCLEAR TECHNIQUES TO ADDRESS SPECIFIC RED TIDE (HARMFUL ALGAL BLOOM) CONCERNS

Proponents : Philippines, Malaysia, Indonesia

Participating Countries : Thailand, Malaysia, Indonesia, New Zealand, the Philippines

Starting Date : 1997

Duration : Three years

Introduction and Background:

Countries with extensive coastlines have vast areas for fisheries and agriculture. In recent years, however, countries like Malaysia, Indonesia, Brunei and the Philippines have experienced having their coastlines affected by *Pyrodinium bahamense* var. *compressus* (Pbc) toxic red tides. Paralytic Shellfish Poisoning resulting sometimes in deaths have been recorded to be caused by shellfish contaminated by this organism. Thus, the organism has caused negative public health and economic impacts in these countries.

In the Philippines, for example, Manila Bay is one of the heavily affected areas by red tide. *Pyrodinium* bloom has been recorded in the bay since 1989, occuring almost annually since 1991. Losses to the Philippine seafood industry as a result of Pbc blooms could be as high as $300,000 dollars per day at the height of red tide season.

Pyrodinium toxic red tides are relatively less studied. Monitoring and research data have been proven very useful in enhancing management schemes in other toxic/harmful algal blooms (HAB) in other countries.

During his Presidency in the 1996 IAEA General Conference, Secretary William G. Padolina discussed with IAEA officials the possibility of applying nuclear techniques to address the HAB problem. As an immediate response, the IAEA sent an Expert Mission to study possible areas of research in HAB where nuclear techniques offer a distinct advantage in solving specific problems. The Mission suggested areas where isotopic techniques can be used. Successful utilization of nuclear techniques to address the red tide problem will contribute greatly to public acceptance of nuclear techniques. The red tide problem is a much publicized issue in the countries affected.

Objectives:

1. To develop the protocol for labelling the red tide toxin with the end in view of future technology transfer of radioactively labelled toxins for regional and international use.

2. To introduce a rapid assay technique based on radiolabelled-saxitoxin for toxin determination

3. To undertake sedimentation studies related to red tide occurences

4. To develop predictive models of the behavior of algal blooms as affected by the interplay of the causative organism with environmental parameters in the water column and the sediments

Expected Results

1. Purified saxitoxin and tritium-labeled saxitoxin
2. Nuclear-based rapid assay for the red tide toxin
3. Age of core sediments and rate of sedimentation
4. Cyst profile of core sediments
5. Trace element and nutrient profiles of core sediments
6. Predictive models for the onset and persistence of algal blooms

Activities Under the Project

1. Application of Nuclear Assay Technique for Algal Toxin Determination
    a. Synthesis of tritium-labelled saxitoxin
    b. Development of rapid assay for saxitoxin
    c. Field testing of rapid assay for saxitoxin
2. Sediment studies related to red tide occurrences
    a. Radiometric core sediment dating
    b. Toxic algal cyst densities in sediments
    c. Nutrients and estimates of benthic flux
    d. Record of red tide occurrence in bay sediments and the influence substrate in triggering the blooms: and attempt to discriminate between man-made and natural causes

3. Modeling of toxic red tides in the Participating Countries

Cost of the Project :

The Philippines has committed US $50,000 under the new UNDP project for environmental marine pollution studies specifically on red tide.

IAEA INPUTS REQUIRED :

YEAR	EXPERTS mm	FELLOWSHIPS mm	RESEARCH CONTRACTS	GROUP MEETINGS	TOTAL
1997	5	12	$ 48,000 (8)	$30,000	$164,000
1998	3 -	-	48,000 (8)	30,000	108,000
1999	3 -	-	48,000 (8)	30,000	108,000
TOTAL	11($110,000)	12 ($36,000)	$14[illegible],000	90,000	$380,000

Suggested Implementation:

It is proposed that the Philippines undertake actvity (1a, 1b) the synthesis of tritium-labelled saxitoxin and the development of a rapid assay for saxitoxin. Activities 1c, 2 and 3 can be undertaken by all participating countries.

EXPERT REGIONAL WORKSHOP ON EFFECTIVE
FOR NUCLEAR POWER PROGRAMME IN RCA COUNTRIES
TAEJON, REPUBLIC OF KOREA
12-16 JUNE 1995

CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The Asia and Pacific (A&P) region is undergoing a phase of phenomenal economic growth. This growth, however, is invariably associated with the fast growth of energy consumption in general, and of electricity use in particular.

The options available for electricity generation include hydro, thermal based on fossil fuels, geothermal, nuclear and non-conventional energy resources. A diversified energy resource base for electricity generation may be required to meet the rapidly growing demand. Fossil fuel resources are undoubtedly essential, but are finite and thus cannot last forever. In view of the growing environmental concerns such as carbon dioxide releases, global warming and ozone depletion, limitations may come in the future on the extent of burning of fossil fuels. Moreover, the occurrences of fossil resources such as coal and oil are unevenly distributed in some regions causing difficulties in transportation.

In the context of the above resource scenario, the role of nuclear power assumes importance in particular to the Asia and Pacific region. Nuclear power has proved to be an economically viable and environmental friendly source of energy for electricity generation. At the end of 1994, 432 nuclear power reactors were in operation in the world, contributing about 17% of the total electricity generation. The experience and studies in the A&P region also show that nuclear energy is a viable solution to meet the rapidly growing demand for electricity, and as a result, a number of nuclear power plants are either in operation, under construction or being planned to be introduced in the A&P region.

However, there are certain key issues in the form of barriers which are being encountered in the implementation of nuclear power programmes (NPPs) at both the international and national levels. Some of these potential constraints in the context of the experience in the A&P region and possible strategies to overcome them are summarized below.

I. KEY ISSUES IN NUCLEAR POWER PROGRAMME IMPLEMENTATION

1. INTERNATIONAL LEVEL

Internationally, there are differing situations with regard to nuclear power development. On the one hand, there is stagnation in nuclear capacity addition in most of Europe and the USA. On the other hand, some countries in Europe, such as France in particular, and countries in the A&P region, are proceeding with their nuclear power programmes. This situation is to be viewed as an evidence of demand for electricity having reached a saturation level in Europe and the USA as compared to the rapidly growing economies of the A&P region where demand for electricity is very high. In the case of France, the inadequacy of primary energy resources is a reason for continuing to expand the nuclear power programme.

The accident at Chernobyl has resulted in enhanced international cooperation such as in the early notification of accidents and cooperative actions towards the mitigation of the effects in case of accidents. In addition, many countries have had and are having their existing nuclear power plants reviewed to assess their level of safety, and measures are being undertaken for improving their safety and reliability.

In the case of the A&P region, the key issues affecting the implementation of nuclear power programmes, as related to the international situation, are:

- the non-standardization of nuclear power plants as well as differing technologies and unit sizes prevalent at the international level;

- changing regulatory review procedures due to continually evolving safety standards;
- increases in construction and operating costs of nuclear power plants;
- the need for assurance of supply of plant equipment, fuel, and related services on a continuing basis;
- constraints in nuclear power technology transfer;
- a generally unfavorable international climate for investments in nuclear power projects.

2. NATIONAL LEVEL

2.1 Governmental support and commitment

The successful introduction and efficient implementation of a nuclear power programme in any country necessitates a firm government commitment on a long-term basis.

2.2 Organization for a NPP

The introduction of nuclear power technology requires the mobilization of resources that will largely surpass endeavors for other projects in the country. Adequate planning and timely decisions at several stages of the programme are a must for its successful implementation. This necessitates a complex organization with participation of the different parties involved in the process. Improper identification of the organizations to be involved and lack of definition of their responsibilities may jeopardize certain individual projects and eventually the overall programme.

2.3 Public acceptance

The public perception regarding nuclear power may act as a constraint for successful implementation of a nuclear power programme. Therefore, public concerns need to be effectively tackled at an early stage of planning and continuously addressed during implementation of the programme.

2.4 Energy policy

The decision to introduce and implement a nuclear power programme should be taken in the light of the overall energy and socioeconomic development policies of the country, with due account of all costs and benefits associated with the energy supply options available. In this context, nuclear is often seen as a too complex technology and its benefits are improperly evaluated.

2.5 Financing

Since nuclear power projects require larger financial outlays and longer construction periods than fossil fired electricity generation options, the financial demands of these projects may become a constraint for implementation. Factors relating to the potential sources and conditions of financing need to be specially addressed.

2.6 Technical aspects

Technical aspects of particular relevance for successful deployment of nuclear power include among others, reactor technology, nuclear waste disposal, decommissioning, etc.

The decision on choice of reactor technology needs to be taken at an early stage of planning for the nuclear power programme with due account to national objectives. This decision is necessarily dependent on the wide variety of types and sizes of reactors available in the market, as well as national factors such as grid size and projected electric supply system expansion.

The unit size is a function of the required expansion of the generating system and the characteristics of the national power grid. The objective of stable and reliable operation of the unit in the electrical grid will be an important factor. In this context, small and medium power reactors are also necessary to be considered in specific cases.

Aspects related to nuclear waste, decommissioning of nuclear installations, etc. also need to be addressed at the early stage of the planning in order to prevent that they become a bottleneck during implementation of the programme. This will also increase public acceptance.

2.7 National participation

Similarly, targets and strategies for national participation in the implementation of nuclear power projects should be decided at the early stages of planning for the nuclear power programme. These targets should be based on a realistic assessment of the current capabilities of national industrial infrastructure. Continuous monitoring of the realization of the intended targets and early detection of necessary corrections may avoid unnecessary delays and increased costs of certain projects.

2.8 Siting and environmental considerations

Siting of large power projects, especially hydro and nuclear power plants, have become a rather complex problem because of several reasons. Hydro power plants may have repercussions to the environment in terms of displacement of population and fauna and flora in the area where the plant would be located. In the case of nuclear, specific requirements for the site are basically related to safety considerations as well as of the distribution of population around the area of the plants. Consequently, the siting of nuclear power plants should be based on a well-defined set of criteria. These criteria should take into account current and projected socioeconomic, cultural and demographic characteristics of the country.

2.9 Manpower development

The availability of trained staff and workers to fulfill all duties involved in the planning and implementation of a nuclear power programme may become an important issue. This aspect becomes increasingly relevant depending on the degree of national participation desired by the country.

2.10 Regulatory aspects

Nuclear is a very advanced technology that needs to comply with a set of very stringent regulations. Absence of this regulating framework or lack of its clear definition would not only create confusion in terms of definition of contractual agreements but also in settlement of disputes among the suppliers and the buyers. In addition, this would expose any proposed NPP programme to general criticism of its viability and ultimate safety.

II. PROPOSED ACTIONS

1. AT THE INTERNATIONAL LEVEL

1.1 Historically, different countries have developed reactors of different types and sizes, thus, making the standardization of plant design almost impossible to attain, in most cases. However, in the case of the A&P region, it is observed that some countries are developing their own standard design of nuclear power reactors. RCA countries interested in the introduction of nuclear power may conduct feasibility studies and consequently select nuclear power plants of the required type and sizes out of the designs available for export.

1.2 The safety of new and evolutionary nuclear power plant designs are usually reviewed in the respective supplier countries. Consequently, this will make the procedure for licensing such designs in the importer countries comparatively easier. In so far as codes, guides and standards are concerned, importer countries may either develop their own codes, guides and standards or adapt those of foreign countries, including that of the supplier countries. Contracts with supplier countries preferably would include provisions for continued cooperation with respect to any subsequent evolutionary safety features to be incorporated in the design.

1.3 Repeat orders of standardized designs, efficient project management, and realistic project scheduling may help reduce investment costs to some extent. Efficient operation, improved capacity utilization, and efficient financial management will substantially improve economic performance of nuclear power plants.

1.4. Supply of equipment, spare parts, special materials, services and fuel covering the entire life cycle of the plant have to be assured under appropriate provisions of the contract with the supplier, if possible. Support of the supplier country's government is considered crucial in this context. This may be realized through an inter-governmental bilateral agreement on nuclear cooperation.

1.5 Transfer of technology may be included in the contract, depending on the national objectives on local participation. A separate agreement with the supplier on transfer of technology may need to be concluded. The bilateral agreement, as mentioned in the preceding paragraph, should have the provision to guarantee transfer of technology.

Success in the acquisition and absorption of technology by the recipient country will depend on availability of trained manpower and adequate infrastructure, including research and development. This may be attained by development and implementation of a matching programme on human resource and infrastructure development. Acquisition of technology could be implemented in phases.

2. AT THE NATIONAL LEVEL

2.1 Government support

As indicated in 1.1 above, a firm government commitment on implementation of a nuclear programme on a long term basis has to be delineated at an early stage in order to facilitate successful realization of the programme.

Nuclear power can be looked upon to yield benefits from long term considerations. Policy issues relating to nuclear power need to be presented periodically at the policy making level in the Government in a balanced manner. Therefore, it is important to present in a comprehensive manner all technical and economic studies including issues related to environmental protection, the role that nuclear power can play in the energy mix and the overall impact in terms of diversification of energy resources and the associated benefits for energy security, long term advantages of this solution, etc. This will imply presentation of the advantages and constraints associated to this form of electricity generation. Proper information should be made available to the policy makers in the government agencies and electric utilities, particularly for energy importing countries, on comparative economics, health and environmental effects of different generating technologies in order to facilitate constructive discussions and decisions on nuclear power development vis-à-vis future energy policies. This will help to identify clearly the position of nuclear power in the context of the overall energy policy of the country. The energy resource basis of the country will have an important bearing in this regard. If nuclear is not accepted by the Government as a policy arising out of sociopolitical considerations, an immediate solution may not emerge. If the issue is of technico-economical nature, studies and presentations on the subject for a policy review may yield results. The IAEA has published a document on policy considerations in regard to nuclear power which can be used as a reference.

2.2 Public acceptance

The solutions at the national level are multi-fold and can be summarized as follows:

(1) In regards to general issues relating to nuclear power, publish the material in local language in an easy and simple manner avoiding too technical terms. The IAEA and several other international organizations have published material on safety, environmental protection, radiation exposure, radioactive waste management and decommissioning which can the referred to for review and preparation of a brief document,
(2) Conducting public seminars, workshops, etc., on topical issues,
(3) Responding to the media and building consensus,

(4) Communicating through elected representatives of the legislature to the public,
(5) Communicating through teachers by means of workshops and seminars,
(6) Encouraging visits of the public to nuclear power facilities such as research reactors, power reactors (if any), etc.
(7) Reasonable compensation package for displaced persons and land losers, and to establish rapport with the people in the area.

2.3 Economics and financing

The economics of nuclear generation are characterized by relatively high investment costs and low fueling costs when compared to alternatives based on fossil fuels. Investment costs are dictated by the relatively longer construction periods and consequent capital outlays and financing requirements. Thus, there is a need to monitor and control plant construction periods and maximize power output during commercial operation.

In regard to financing, alternative options which may be explored are as follows: (i) suppliers' credit to cover his portion of the supplies, (ii) market borrowings, (iii) using internal surplus from the existing generating capacity base, (iv) joint ventures to mobilize additional equity, (v) adopting concepts such as BOO, BOT, BTO, etc., (vi) mobilizing equity from the capital market, (vii) Government budgetary support.

2.4 Technical aspects

Choosing the type (technology) and size of a reactor will depend on several national objectives and market availability. Owing to the complexity of these issues, no specific guidelines can be given, since such decisions should be the result of the feasibility study, with due account to the national objectives and current and foreseen conditions. Prospects for technology transfer, adaptability under local conditions, assurance of supply, etc., among other factors, may influence selection of technology.

The establishment of a nuclear fuel cycle is essential to the development of nuclear power generation, requiring efforts to gain an extensive understanding in this respect and to take positive approaches to problems concerning, among others, the back end of the fuel cycle. Alternatively, long term storage of spent fuel both at the plant site and final repository has to be provided. Efforts will be required to work out a set of comprehensive, well coordinated measures for the treatment and disposal of radioactive waste. Constant updating on the technological developments in nuclear waste disposal and early studies on final national repository sites have to be undertaken.

2.5 National participation

This will depend on the industrial base of the country. An assessment of the industrial capabilities and potential of the country with respect to a nuclear power programme must be made, and a plan of development of selected industries has to be drawn up. This has to be done on the basis of the overall programme and not for a single unit. The strategy for national participation can be based on a step by step increase, beginning with operation and maintenance (O&M), construction management, manufacture of conventional equipment, manufacture of nuclear components and achievement of design capabilities, in order. A systematic programme for involvement by national industries should be developed starting with low-technology areas, such as civil construction, fabrication of non-nuclear piping systems and other conventional equipment, etc., and gradually moving to high technology fields. The ultimate objective would be to attain a large degree of self reliance.

2.6 Siting

An early identification and preselection of sites required for future nuclear power plants will reduce possible future constraints in terms of competing demands from other national development activities.

The strategies to overcome the constraints on siting are:

(1) multiple units at the same site to reduce the number of sites,

(2) larger unit size consistent with the national grid,
(3) in the long term, review of siting criteria and upgrading reactor designs with respect to population considerations around the nuclear power plant.

2.7 Nuclear regulatory aspects

The promotional and regulatory infrastructure often develops around the national research centre initially. Early experience on research reactors and nuclear research could form the focus for development of this infrastructure. The regulatory bodies should be functionally separated from nuclear power programme implementation agencies and be strengthened for timely decisions on safety related aspects of nuclear power plants. A functional separation of organisations responsible for the regulation and promotion of the nuclear power programme will reduce potential conflicts of interests but may incur additional administrative costs. The timing for a separation of functions may be decided at an appropriate stage of development of the nuclear power programme.

The applicable national codes, guides and standards should be developed or adapted from internationally used codes, guides and standards at an early stage to assure consistent levels of safety.

2.8 Standardization of regulatory review

The actions at the national level are:

(1) standardization of nuclear power plant design,
(2) standardization of the regulatory review process,
(3) advance actions on regulatory review and licensing,
(4) mid stream changes restricted to only evolutionary changes related to safety.

2.9 Manpower development

Manpower is also very critical for successful implementation of nuclear power projects. Professionals should be trained in the areas of design, project management, safety, etc. In addition, appropriate organizations equipped with trained and skilled manpower should be developed to undertake various jobs during the implementation phase and later, for maintenance and safe operation of nuclear power plants.

Since manpower development for a nuclear power programme is a lengthy process, a comprehensive manpower development programme should be formulated and implemented at an early stage. The scope of this manpower development programme should be commensurate with the size and nature of the nuclear power programme.

3. AT REGIONAL LEVEL

3.1 General

RCA has provided a very efficient framework for fostering regional cooperation in most fields of peaceful application of nuclear energy, including nuclear power. The RCA project on *Energy and Nuclear Power Planning* in particular promoted this cooperation in terms of the organization of workshops, training courses, transfer of software and hardware, fellowships, and country missions related to the IAEA planning models for energy, electricity and nuclear power planning. Continuation of this project is perceived as a means of further improving the cooperation among RCA countries.

The implementation of the new RCA project on *Nuclear Power Planning* is seen by the participants as a desirable follow-up to the initial efforts indicated above which would undoubtedly enhance cooperative efforts within the region. Although the definition of the actual cooperation among RCA countries would necessitate decisions at higher national and regional levels, from the technical point of view, several aspects can be identified as desirable and achievable within the scope of the present project depending on the availability of financial support. Aspects to be included in a non-exhaustive list are the following:

- development of promotional and regulatory infrastructure,
- assessment of industrial potential and planning for its development,
- feasibility studies, bid invitation and specification preparation, and bid evaluation,
- site selection,
- strengthening project management,
- manpower training.
- etc.

In addition, several general recommendations have been identified for the continuation of the RCA project, namely:

- Financing is the most important issue for implementation of nuclear power projects in most developing countries. Review of this problem at the regional and national levels, and identification of possible solutions to the problem, are important objectives of the project.

- There is an immediate need for developing an efficient and workable mechanism for timely exchange of information and sharing experience among RCA Member States. The present project offers the opportunity to provide such a mechanism. In this respect, it is recommended that all activities to be organized within the present project make use, as much as possible, of the expertise already accumulated in the region. This will involve the participation of experts from the RCA region in missions to be sent to requesting countries within the region to provide assistance on NPP matters. Likewise, experts from within the region should be used as trainers for training courses, workshops and seminars organized in the frame of the project.

- Activities to be organized within the project should be put into the regional perspective but having as a background the regular TC programme and other assistance offered by the IAEA, including public acceptance strategies and implementation details of various countries using nuclear power, training courses, fellowships and scientific visits, publications, etc. The objective is to avoid as much as possible duplication of efforts.

3.2 Specific Actions

Several types of activities should be organized within the project, including:

1. Regional seminars/workshops and training activities on:

- Identification of infrastructure needs in various countries of the region
- Strategies on the localization, standardization and self-reliance in manufacturing and construction of NP plants
- Financing of NPP (vendors and lenders to be invited)
- Technology-transfer and indigenization strategies and experiences.
- Economics of nuclear power.
- Organizational aspects.
- Strengthening of regulatory activities.
- Preparation of bid documents.
- Evaluation of bids.
- Siting.

2. National Seminars:

National seminars could be arranged upon request by interested countries to inform the national decision makers about the benefits of nuclear power in the long run.

3. Expert Services

RCA could provide, on request by interested countries, expert services on specific issues of nuclear power project planning and implementation such as preparation of bid documents, and assessment of indigenous capabilities and infrastructure, with particular reference to the identification of scope for local participation.

4. Exchange of Visits

Exchange of visits by planners and management personnel from RCA countries should be arranged to countries having experience in the implementation of nuclear power projects, in order to obtain a clearer view of actions needed to successfully surmount potential barriers.

3.3 Action Plan

Taking into consideration the above listed activities, the following programme of activities is proposed for the continuation of the project:

	Estimated Date:	Duration:	Audience:
1. Workshop (WS) on Infrastructure Needs and Organizational Aspects of NPP's	End 95/Beg. 96 Jakarta, 21-27 Apr.96	1-2 weeks	Planners in RCA Countries
2. WS on Economics and Financing Aspects of NPP's	Mid 96/End 96	1-2 weeks	" " " "
3. WS on Strategies for Localization, Standardization & Technology Transfer	1-3 Quarter 97	1-2 weeks	" " " "
4. WS on Preparation of Bid Documents and Evaluation of Bids	4 Quarter 97/ 1-2 Quarter 98	1-2 weeks	" " " "
5. WS on Regulatory Activities and Siting	End 98/Mid 99	1-2 weeks	" " " "
6. Country Missions	Upon request	1 week	

Note: Activities 1-5 to be organized according to budget availability. There should be an interval of 6-8 months between successive workshops. The programme is to be reviewed by the National Project Coordinators at the mid-term review meeting of this project in 1997.

Prospectus

Title:	IAEA (RCA) Regional Training Course on Nuclear Power Project Planning and Implementation
Place:	Nuclear Training Center of Korea Atomic Energy Research Institute, (P.O. Box 105, Yusong, Taejon 305-600, The Republic of Korea)
Date and duration:	8-29 October 1997 (3 weeks)
Deadline for nomination:	11 July 1997
Organizers:	The Government of the Republic of Korea, through the Korea Atomic Energy Research Institute (KAERI) in co-operation with the International Atomic Energy Agency, and under the sponsorship of the Korea International Cooperation Agency (KOICA)
Participation:	The course will be open to 20 participants from the IAEA RCA member states in the Asia and pacific region which have their own nuclear power programme or will have it in the future.
Purpose of the course:	The purpose of the course is to provide the participants with the knowledge of nuclear power project planning and implementation with emphasis on good practices learned from worldwide experience; define the tasks that are involved; provide a basic understanding of tools, methods, techniques and practices that are used; and introduce them to the areas of work that may be required to perform or direct.
Language:	The language of instruction will be English
Participants' qualification:	Candidates should be senior or middle management professionals with 30-40 years old who work for Governmental authorities or utilities responsible for nuclear energy matters and national industry, likely to participate in a nuclear power project, and who will be involved in the planning and implementation of a nuclear power project. They should have have a university education in science, engineering, economic or management and 3-5 years of relevant experience. Prior basic knowledge of nuclear technology and engineering would be helpful.

Nature of the course: The course will consist of lecturers, discussions, small group worksessions and demonstrations. A sicentific visit to nuclear power plants and R&D facilities will also be included. The followings are major contents of the course.

- Introduction and Overview of Nuclear Power Project Management
- Planning of Nuclear Power Project
- Negotiation and Contract
- Project Execution (I)
- Project Execution (II)
- Plant Operation and Maintenance Management
- Discussions, Workseesions, and others
- Scientific visits to Nuclear Power and R&D Facilities.

Application procedure: Nominations may be submitted on the standard IAEA application form for training courses. Completed forms should be endorsed by and returned through the official channels established (the Ministry of Foreign Affairs, the National Atomic Authority, or the Office of the United Nations Development Programme). They must be received by the International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna, Austria, not later than 11 July 1997. Nominations received after that date or applications which have not been routed through one of the aforementioned channels cannot be considered.

Advanced norminations by facsimile (43-1-20607), telex (1-12645) or e-mail(iaeo@iaea1.iaea.or.at) are welcome. The facsimile/telex/e-mail should contain the following basic information about the candidate: name, age, sex, academic qualifications, present position including exact nature of duties carried out, proficiency in English and full working address (including telex, facsimile and telephone numbers).

A copy of the nomination forms should also be sent to the Host Institute at the address given below;

Nuclear Training Center
Korea Atomic Energy Research Institute
P.O. Box 105, Yusong, Taejon 305-600
The Republic of Korea
Tel : 82-42-868-2678
Fax : 82-42-861-5018

Language certificate: In the case of countries in which English is not an official or customary language, nominations must be accompanied by a separate certificate of the candidate's proficiency in English. This certificate must be issued by a language school, cultural institution or an embassy of a country in which the language of the course is spoken.

Administrative and financial arrangements: Nominationg Governments will be informed in due course of the names of the candidates who have been selected and will at that time be given full details of the procedure to be followed with regard to administrative and financial matters.

The Government of the Republic of Korea through the Korea International Cooperation Agency will, out of its contribution to RCA, pay the costs of the participants' air travel from their home countries to Seoul and return, as well as a stipend sufficient to cover the costs of their accommodation, meals and incidental expenses.

The organizers of the course do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in nominating participants, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

IAEA/RCA Regional Training Course on
Nuclear Power Project Planning and Implementation
NTC/KAERI, R.O.K., 8-29 October 1997

Syllabus

1. Introduction and Overview of Nuclear Power Project
   - 1.1 Status and Trends of Nuclear Power in the World
   - 1.2 Overview of Nuclear Power in Kore
   - 1.3 Characteristics of Nuclear Power Project Management
   - 1.4 Regulatory Framework, Licensing Stages and Procedures
   - 1.5 International Supply Market and Non-Proliferation
   - 1.6 Public Acceptance
   - 1.7 IAEA Activities of Nuclear Power Project Management

2. Planning of Nuclear Power Project
   - 2.1 Feasibility Study of the First Nuclear Power Project
   - 2.2 Project Organization and Work Breakdown
   - 2.3 Project Management Rules and Procedures
   - 2.4 Manpower Planning and Personnel Profiles
   - 2.5 Review of Codes and Standards in the World for NPPs
   - 2.6 Establishment of Quality Assurance Programme
   - 2.7 NPP Site Characteristics and Requirements

3. Negotiation and Contract
   - 3.1 Preparation for Invitation to Bid and Bidding Process
   - 3.2 Evaluation of Bids, Economic and Fianancial Framework Evaluation
   - 3.3 Negotiation and Contract
   - 3.4 Financing Nuclear Power Projects
   - 3.5 Indigenous Strategy and Technology Transfer

4. Project Execution (I)
   - 4.1 Project Management Interfaces
   - 4.2 Project Management Information System, Computer Aided Project Mgt.
   - 4.3 Tools and Methods for Project Management
   - 4.4 Project Control and Monitoring
   - 4.5 Procurement and Material control, Documentation Control
   - 4.6 Site Management

5. Project Execution (II)
   - 5.1 Project Management in Design Activities and Architecture Engineering
   - 5.2 Equipment and Component Manufacturing
   - 5.3 Construction and Site Management
   - 5.4 Construction and Site Management, Good Practice in Construction Activities
   - 5.5 Interface between Construction and and Operation Takeover

6. Plant Commissioning and Operation
   6.1 Management of Commissioning, Operation and Maintenance
   6.2 Pre-service/In-service Inspection of Nuclear Power Plant
   6.3 Accident Management Planning and System
   6.4 Computerized Operation Support Systems
   6.5 Training Programme for NPP Personnel
   6.6 Management and Disposal of Radioactive Wastes

7. Technical Visit to Nuclear Power Related Facilities and Others
   7.1 Visit to Nuclear Power Plants
   7.2 Visit to Nuclear Training Center of Utilities
   7.3 Visit to Nuclear R&D Facilities
   7.4 Visit to Nuclear Related Heavy Industries
   7.5 Participant Talks, Discussion, Course Evaluation, and Others

Statement of Thai delegate in 19th RCA Working Group Meeting, Yangon, Myanmar, 11 March 1997.

Referring to the 18th RCA Working Group Meeting in Beijing on 20-24 May 1996, the Thai delegate has proposed in agenda no. 2: The medical and biological application of nuclear technique for radiation sterilization of biological tissue grafts. Thailand planned to become the regional training centre for human tissue banking; and requested the IAEA expert to visit the centre to assist in the design of the post-graduate curriculum and if it is possible to include the undergraduate and the technician levels. This statement was documented in the executive summary. During this time, there was a proposal that Singapore submitted to 25th General Conference at Vienna on 18 September 1996. Although it was acknowledged that Thailand was proceeding to establish the center for regional training. The Thai delegate was surprised that the IAEA regional training center was to be set up in Singapore. We disagree that IAEA regional to separate the training into two levels; namely, post-graduate and technician training. The reason is that in the master degree project, we must put an effort to achieve a high standard of laboratories and teaching facilities. We have to recruit many teaching staffs from many medical centers and universities throughout Thailand. Some of them are recruited from Pakistan, Indonesia and the USA. The most important problem is technician training which will accomplish the course work for a master degree programme because the technician trainee will be teaching material for the master level. If the technician training center is separated in Singapore, the trainer will encounter the lack of trainee exposure in Thailand. Another reason that should be mentioned here, the experience: Thailand has set up tissue banking at least 18 years. With our experience, we are well-recognized by countries in this region. Thailand also established the Asia Pacific Association of Surgical Tissue Banking in 1989. Our delegate has been assigned to be not only an IAEA expert to operate his expert mission in Bangladesh, Viet Nam and Indonesia but also a temporary advisor of WHO to Sri Lanka. The function of this advisor and IAEA expert were demonstrations of tissue retrieval, surgical operations of allograft implantation and also to set up the network on a study project to acquire more donors in those countries. The experience on tissue graft procurement and processing was sent to supply 47 hospitals used by 136 surgeons. This includes the overseas patient that were operated upon their home countries and Bangkok; moreover, to compaign for tissue donations the Tissue Donor Association was established in Thailand. The activities of members of association have enhanced the publication to achieve more co-operation from the public. In research and development, visiting fellows from neighboring countries attended from time to time. To run activities and R&D, the feasibility of a regional center tissue banking is more favorable in Thailand in term of clinical experiences, management and R&D, training experience and the resources is available to run this regional training center; furthermore, the geographical location and logistics favour Thailand. To compare the populations, Thailand has 60 million people. There are around 20,000 physicians. The potential users are approximately 2,000 in different fields such as orthopedic surgery, opthalmology, nuero-surgery plastic surgery. There will be sufficient donors to give allograft to recipients. The tissue bank in Thailand will serve as a department of the teaching hospital which will be the first department in the faculty of medicine in this region. In addition, there is a strong public support for the setting up of a foundation. It should be recognized as an established tissue bank with resources and location to be set up as IAEA regional training center.

REPORT OF WORKING GROUP ON REGIONAL TRAINING CENTRE FOR TISSUE BANKING

Delegates from Singapore, Thailand, Malaysia, Indonesia, Japan and RCA Coordinator met for discussion to find a solution to the issue in question. The Meeting was chaired by Dr A Djaloeis (Indonesia). The discussion took into consideration all the past developments and reports concerning the issue, such as the Report of 18th Working Group Meeting in Beijing and the Report of National Coordinator's Meeting on Radiation Sterilization of Tissue Graft, 30 Sept. - 4 Oct., 1996 Brisbane, Australia. The meeting confirmed that Singapore's proposal was presented at the 18th WGM in Beijing 1996 and was endorsed at the 25th Annual RCA General Conference Meeting in Vienna 1996. The meeting also confirmed that Thailand indicated (in the country statement) her strong intention to set up a post-graduate course in Tissue Banking at the 18th WGM, but that unfortunately no official follow-up action was taken on her (Thailand) part up to the present 19th WGM.

The meeting reiterated its appreciation of the offer made by the Government of Singapore to establish a Regional Training Center (RTC) for Tissue Banking for use by the Region for the training of tissue bank operators. Certification of the diploma course will be provided by the National University of Singapore. This RTC shall be operated in close liaison and coordination with the Regional Center for Post Graduate Studies in Tissue Banking (terminology subject to revision by the offices concerned) to be established and developed in Mahidol University, Bangkok, by the courtesy of the Government of Thailand. Member States as well as the Agency are encouraged to provide these Centers with any necessary assistance and contribution, financial and otherwise, so as to enable these Centers to function as Centers of Excellence in the Region.

Ref:

1. Report of RCA WGM, Beijing, China, 1996

2. Report of RCA General Conference Meeting, Vienna, September 1996

3. Report of National Co-ordinator's Meeting, Brisbane, September-October 1996

4. Report of Consultants Meeting on Tissue Banking (Ref. 5.2.4), Vienna, June 1996

5. Country Statement by Thailand, 19th WGM, Yangon

IAEA/RCA NATIONAL COORDINATORS MEETING AND PROJECT FORMULATION MEETING FOR THE PROJECT TO STRENGTHEN RADIATION PROTECTION INFRASTRUCTURES (RAS/9/018) TAEJON, REPUBLIC OF KOREA, 24-28 FEBRUARY 1997

SUMMARY

1. INTRODUCTION

The Meeting was attended by National Coordinators for the Project to Strengthen Radiation Protection Infrastructures (here after referred to simply as, "National Coordinators") from 15 RCA Member States. Only Indonesia and Singapore were not represented. The host for the Meeting was the Korea Institute of Nuclear Safety (KINS). The Meeting opened with welcoming addresses from Mr. Se-Jong Kim, President of KINS, and Dr. Young Shik Kim, Director of the Korean Ministry of Science and Technology (MOST). Mr. Richard Griffith, Technical Officer for the RCA Project to Strengthen Radiation Protection Infrastructures, RAS/9/018 welcomed the participants on behalf of the Agency.

Mr. Griffith reviewed the IAEA programme in radiation protection to provide background for the discussions of the week. Mr. Belkacem Djermouni, Regional Manager for the IAEA Model Project in East and West Asia presented an overview of the Model Project. His presentation emphasized the potential importance of the RCA Programme in addressing Model Project needs.

2. 1997 PROGRAMME ADOPTION

Mr. Griffith reviewed the programme for the Project, Strengthening of Radiation Protection Infrastructures, Phase II, with emphasis on the activities conducted in 1996. This was followed by the presentation of the proposed activities for 1997, based on the original programme outlined during the Phase II Project Formulation Meeting in 1992 with modification agreed during the subsequent National Coordinators Meeting and Mid-Term Review (1995) and Expert Advisory Group Meeting (1996).

The discussions that followed focussed on the technical issues of the proposed activities, including a presentation by Mr. Katagiri, PNC, on a proposed two week training course on Developments in Radiation Protection. Mr. U.C. Mishra, Bhabha Atomic Research Centre, India noted that the proposed 1997 programme has no activities specifically addressing the issues of radiation protection in medical or industrial applications. The need for these activities was strongly supported, however, it was acknowledged that 1) the potential Agency Technical Officers needed to organize these activities were fully committed for 1997, and 2) it would be generally difficult to initiate an activity in this area at this point. Therefore, it was agreed that this need would be addressed in the next Phase of the programme.

Following some additional discussion, the Project Formulation Meeting endorsed adoption of the activities shown in Table I, including the potential funding sources.

TABLE 1 - ADOPTED 1997 RAS/9/018 ACTIVITIES

Activity	Dates	Venue	IAEA Technical Officer	Funding Source	Estimated Cost* - US$
Project Formulation Meeting	24-28 February	Rep. of Korea	Mr. Griffith	IAEA	60,000
Distance Learning Workshop	17-21 March	Australia	Mr. Mason	AUS	58,000
Environmental Sample Analysis Workshop	August-September	Australia	Mr. Stegnar	IAEA	73,000
Expert Advisory Group Meeting on Radon Monitoring	26-30 May	Mongolia	Mr. Stegnar	IAEA/JPN	14,000
Training Course on Biological Dosimetry	29 September - 3 October	Japan**	Mr. Turai	IAEA	43,000
Training Course on Recent Developments in Radiation Protection	10-21 November	Japan	Mr. Webb	JPN	66,000
Workshop on Off-Site Emergency Preparedness	November	Philippines	Mr. Crick	IAEA	45,000
Expert Meeting on External Dosimetry Intercomparison	1-5 December	India	Mr. Griffith	IAEA	46,000
Reference Asian Man CRP (Phase II)	N/A	N/A	Mr. Parr	JPN	75,500

* Based on prevailing air fares and Agency Daily Subsistence Allowance (DSA) rates

** To be confirmed, waiting for approval by Ministry of Public Welfare in Japan

3. PHASE III TASK GROUP REPORT AND COUNTRY REPORTS

On Tuesday morning, an overview of the draft proposal of the Phase III Project Formulation Task Group was presented by Mr. Cameron, Task Group Chairman. Mr. Cameron emphasized the importance of regional implementation of the International Basic Safety Standards and related Agency publications as a key theme for the proposed Phase III activities.

Following Mr. Cameron's presentation and subsequent discussion, each of the National Coordinators presented a report to summarize his or her country's radiation protection situation, and position on the draft Phase III proposal. Specifically, they had been asked to present:

1) A brief review of their country's activities related to the RCA programme in radiation protection.
2) Comments on effectiveness of the Phase II project.
3) A description of their country's radiation protection needs as they relate to development of the Phase III project. This should include identification of the parts of the Project that are most relevant to their national needs.
4) Comments on the proposed Phase III project.
5) Specific offers of support for Phase III.

4. ADOPTION OF THE PHASE III PROGRAMME

Each topic area of the draft programme developed by the Task Group was reviewed over a two day period, modified and adopted (Tables 2 to 7). Emphasis was given to activities that:

- are consistent with the Agency's priorities in radiation protection and the Model Project

- had not been undertaken in Phases I or II but were seen as important to strengthening regional radiation protection

- had been successfully conducted in Phase I or II and had received significant support for continuation, such as personal dosimetry intercomparisons, or

- had been identified in Phase II with commitment for continuation (CRP on Reference Asian Man).

TABLE 2 - SUMMARY OF ACTIVITIES IN STANDARDS AND REGULATIONS

1.Standards and Regulations

Objectives :

1. To assist Member States in understanding, introduction and implementation of the Basic Safety Standards (BSS) within the region.
2. To reach a common understanding and application of the principles, practices and measurement techniques recommended by ICRP, IAEA and ICRU
3. To improve the regulation, control, transport, storage and safe handling of radioactive sources and wastes.

Outputs:

1.1 Regionally harmonized guidelines for control of sources at all stages.
1.2 Common understanding and application of the principles, practices and measurement techniques recommended by ICRP, IAEA and ICRU.
1.3 Consistency in practices and regulation for transport of radioactive materials.
1.4 Regionally unified policies for the safe management of radioactive waste.
1.5 Distance learning materials in radiation protection for use in training or accreditation of users of radioactive materials.

Activities	Venue	Funds	1998	1999	2000	2001	2002
1.1 Workshop on monitoring, control and disposal of sources	Indonesia **	IAEA	W -			- W	
1.2 Workshop on latest recommendations, concepts and approach by ICRP and IAEA.	India **	India* **		W -			- W
1.3 Training course on safe transport of radioactive materials	Sri Lanka	IAEA			TC		
1.4 Workshop/Training course on radiation protection principles applied to waste management.	Korea	IAEA			TC		
1.5 Trials of Distance Learning training materials in selected Member States and assistance in their implementation	N/A	Aus.	A				

KEY
W - Workshop S - Seminar TC - Training Course A - Other activity * To be confirmed ** To be determined

TABLE 3 - SUMMARY OF ACTIVITIES IN ACCIDENT MANAGEMENT

2. Accident Management

Objectives :

1. To enhance regional cooperation and effective emergency response for potential radiological incidents within the region.

Outputs:

2.1 Trained emergency response personnel in the principles and practices of emergency response.

2.2 Establishment of consistency and standard procedures for the response of radiological response teams to a regional incident.

2.3 Enhanced organizational arrangements for emergency response.

Activities	Venue	Funding	1998	1999	2000	2001	2002
2.1 Workshop for medical personnel with responsibilities in an emergency.	**	IAEA				W	
2.2 Regional training activity for response teams to include a workshop on radiation monitoring in large areas in emergency situations.	China	IAEA	TC*				
2.3 Workshop for emergency response personnel.	Aus.	IAEA				W	
2.4 Planning seminar for senior planners on using the proposed IAEA system for accident assessment procedures, accident notification and providing assistance.	Thailand	IAEA			S		
2.5 Participation in an emergency exercise – research reactor facility	Aus.	IAEA		W*			

KEY

W – Workshop S – Seminar TC – Training Course A – Other activity * To be confirmed ** To be determined

TABLE 4 - SUMMARY OF ACTIVITIES IN RADIATION PROTECTION IN MEDICINE

3. Radiation Protection in Medicine

Objectives :

1. To increase understanding of appropriate techniques and implementation of best practices in medical applications of radiation.

Outputs:

3.1 Improvement of the present status of QA and QC programmes for radiography and radiotherapy in RCA member states.
3.2 Transfer of modern technology and knowledge of dosimetry including measurement skills and calculation techniques.
3.3 Establishment of appropriate regulatory systems in RCA member states for radiation protection of patients, medical staff and the public from medical exposure.

Activities	Venue	Funding	1998	1999	2000	2001	2002
3.1 Workshop on radiation protection in medical exposure for regulators and hospital staff, including protection of patients, medical staff and the public.	India China or Japan	IAEA	W	W			
3.2 Training course on optimization of collective dose from uses of diagnostic radiography, including QA systems and dose assessment.	Malaysia Indonesia	IAEA		TC		TC	
3.3 Training course on QA and safety of radiotherapy devices.	Philippines	IAEA			TC		
3.4 Intercomparison of medical dosimeters.	N/A	IAEA			A*	A*	A*

KEY
W - Workshop S - Seminar TC – Training Course A – Other activity * To be confirmed at Project Review EAGM, 1998

TABLE 5 - SUMMARY OF ACTIVITIES IN RADIATION PROTECTION IN INDUSTRY

4. Radiation Protection in Industry

Objectives :

1. To enhance national capabilities in Member States to ensure the safety in the use of radiation sources in industrial irradiation facilities.
2. To support establishment of national capabilities in Member States to ensure the safety in practices involving NORM and TENORM from mineral sands, oil and gas industries.

Outputs:

4.1 An adequate and competent national capability for controlling the radiological hazard in industrial irradiation facilities.
4.2 A national capability for controlling the hazard due to NORM and TENORM from mineral sands and radiological hazards in the oil and gas industries
4.3 Effective systems for the control of radon and thoron exposures.

Activities	Venue	Funds	1998	1999	2000	2001	2002
4.1 A regional training course on radiation safety in industrial radiography.	Thailand	IAEA		TC			
4.2 A regional training course on radiation safety in industrial irradiation facilities.	Sri Lanka	IAEA					TC
4.3 An EAGM to harmonize procedures for control of radioactive materials arising in the mineral sands, gas and oil industries	Australia	IAEA	EAGM				
4.4 A regional training course on the safe handling and waste disposal from NORM [1] and TENORM [2] for operators and regulators concerned with the mineral sands, gas and oil industries	Malaysia	IAEA			TC subject to 4.3		

KEY
W – Workshop S – Seminar TC – Training Course A – Other activity

Footnotes
1. NORM - Naturally Occurring Radioactive Material 2. TENORM - Technologically Enhanced Naturally Occurring Radioactive Material

TABLE 6 - SUMMARY OF ACTIVITIES IN OCCUPATIONAL AND ENVIRONMENTAL EXPOSURE ASSESSMENT AND CONTROL

5.Occupational and Environmental Exposure Assessment and Control

Objectives :

1. To establish regionally harmonized procedures for the dosimetry and assessment of occupational exposure to ionizing radiation.
2. To strengthen regional co-operation in environmental radiation monitoring and to establish a regional system for environmental radiation monitoring.
3. To compile the physical, anatomical, physiological and metabolic characteristics of the Asian populations in RCA Member States.

Outputs:

5.1. Calibration of the radiation protection instruments in terms of operational quantities with radiation fields traceable to National/International Standards. Regional harmonization in the conversion factors used and procedures adopted for calibration.

5.2. Evaluation of measurements in terms of dose following chronic exposure to radionuclides of long residence time in the body.

5.3. Regionally harmonized measurement technology and capability for environmental radiation monitoring through inter-comparison.

5.4. A regional system for environmental monitoring.

Activities	Venue	Funds	1998	1999	2000	2001	2002
5.1 Regional training course on occupational radiation protection	Aus. –ARL Japan	IAEA Japan		TC -			- TC
5.2a Regional workshop on calibration of dosimeters and survey instruments for occupational protection	Japan	Japan			W		
5.2b Intercomparison of dosimetry services for external dose assessment Workshop to review Intercomparison results	N/A Pakistan	 IAEA			A	A	A W
5.3 Workshop on neutron dosimetry	Korea	IAEA		W			
5.4a Workshop on application of indirect methods for individual dosimetry of internally deposited radionuclides.	Japan	Japan	W				
5.4b Computational intercomparison of internal dose assessment	N/A	IAEA	A	A			
5.5a Workshop for environmental radiation monitoring	Pakistan India	Korea	W -		- W		
5.5b Intercomparison on environmental radiation monitoring	N/A		A	A	A		
5.5c CRP to establish baseline data (to be confirmed)			A	A	A		
5.6 Reference Asian Man Steering Committee Meeting Research Coordination Meeting	N/A * *	Japan Japan	A SCM, RCM	A SCM, RCM			
5.7 Effluent monitoring and environment assessment	Japan	Japan		TC		TC	

KEY W – Workshop S – Seminar TC – Training Course A – Other activity * To be determined

TABLE 7 - PROJECT REVIEW ACTIVITIES

6. Project Review Activities

Activity	Host	Funding
6.1 1998 EAGM	Sri Lanka	IAEA
6.2 1999 EAGM	Philippines	IAEA
6.3 2000 Mid-term Review	Indonesia or Australia	IAEA
6.4 2001 EAGM	Vietnam	IAEA
6.5 2002 PFM	Australia, Japan, or (?)	IAEA

TABLE 8 - ACTIVITY DISTRIBUTION SUMMARY

Year	Standards	Accident Management	Medicine	Industry	Occupational	TOTALS	Agency Funded
1998	1.1, 1.5	2.2*	3.1	4.3	5.4a, 5.4b, 5.5a	8	4
1999	1.2	2.5*	3.1, 3.2	4.1	5.1, 5.3, 5.4b, 5.7	9	7
2000	1.3, 1.4	2.4	3.3, 3.4*	4.4**	5.2a, 5.2b, 5.4b, 5.5c, 5.5a	11	6
2001	1.1	2.1, 2.3	3.2, 3.4*		5.2b, 5.5c, 5.7	8	5
2002	1.2		3.4*	4.2	5.1, 5.2b, 5.5c	6	3

KEY
W – Workshop   S – Seminar   TC – Training Course   A – Other activity
* To be determined   ** Conduct of activity 4.4 to be determined based on recommendations of EAGM, Activity 4.3

TABLE 9 - ACTIVITY HOST COUNTRY SUMMARY

Country	Hosted Activities				
	1998	1999	2000	2001	2002
Australia	EAGM - 4.3	W* - 2.5 TC - 5.1		W - 2.3	
China	TC* - 2.2	W - 3.1**			
India	W - 3.1	W - 1.2	W - 5.5a		
Indonesia	W - 1.1		Mid-Term Review - 6.3*	TC - 3.2	
Japan	W - 5.4a	W - 3.1** TC - 5.7	W - 5.2a	TC - 5.7	TC - 5.1
Korea		W - 5.3	TC - 1.4		
Malaysia		TC - 3.2	TC - 4.4***		
Pakistan	W - 5.5a				W - 5.2b
Philippines		EAGM - 6.2	TC - 3.3		
Sri Lanka	EAGM - 6.1		TC - 1.3		TC - 4.2
Thailand		TC - 4.1	S - 2.4		
Viet Nam				EAGM - 6.4	

KEY W – Workshop S – Seminar TC – Training Course A – Other activity
* To be determined ** China or Japan, to be determined
*** Conduct of activity 4.4 to be determined based on recommendations of EAGM, Activity 4.3

5. CONCLUSIONS AND RECOMMENDATIONS

The Meeting reviewed the draft report and unanimously agreed that the text in the preceding sections was the correct formal record of the meeting and endorsed the conclusions, recommendations and the Phase III work plan.

The Meeting agreed on the following conclusions:

1. National Coordinators expressed the unanimous view that the Phase 2 activities had been very valuable in strengthening radiation protection in their respective countries.

2. In review of the 1996 programme, they expressed satisfaction with the high degree of project implementation.

3. The proposed programme for 1997 (Table 1) was endorsed as being appropriate and consistent with the original objectives of the Phase 2 project. The budget for 1997 was considered appropriate for the planned activities.

4. In view of the regional radiation protection needs, particularly in the five Model Project Member States, the National Coordinators concluded that continued activities under a third Phase Programme are essential.

5. The proposed activities, as modified during the meeting, were endorsed by all National Coordinators as the essential elements of the programme for 1998-2002. Some activities were postponed for review during the Mid-term Review in the year 2000. Because of the uncertainties involved in establishing five year plans, particularly related to funding, it is expected that changes and additions to the programme would be required following the Mid-term Review.

6. It was agreed that the formation of a Task Group had been a very effective process for drafting proposals for discussion by the PFM. It was noted that, as a key member of the Task Group, the Agency Technical Officer for RAS/9/018, Mr. Griffith, had made a significant contribution to the formulation of the Phase III activities.

7. The meeting expressed concern that the funding for 1998 had to be decided prior to the PFM, and was significantly reduced from the 1997 level, thus hindering 1998 activity implementation. The two year Agency cycle does not appear flexible enough to address the needs of a 5 year cycle for the RCA project.

8. The National Coordinators were agreed that commitment to effective development, management and review of the activities in Phase 3 is essential for assuring their effectiveness. In this context, they noted the difficulties in planning the Phase III activities because the RCA Coordinator was not able to attend the meeting.

9. Concern was expressed that changes in Agency technical staffing and in the Department of Technical Cooperation can easily lead to a lack of adequate support for and result in adverse impact on the Project.

10. The National Coordinators expressed concern that information on nominations for training courses and other RCA activities were not being sent to the National Coordinators to help ensure that appropriate people are nominated.

11. The National Coordinators continue to feel that recognition should be given to individuals who have made a significant contribution to the RCA activities. They will prepare certificates of appreciation for Drs Kobayashi, Easey and Strohal, on behalf of the National Coordinators for their contributions to the RCA Project to Strengthen Radiation Protection Infrastructures. Consideration will be given to future awards at the time those individuals retire from the Project.

12. It was concluded that the title for the Phase III Project should be ***Enhancement and Harmonization of Radiation Protection.***

It was agreed that the following recommendations be made:

1. that the proposed Phase III activities, as modified during the meeting and endorsed by all National Coordinators, be undertaken as the essential elements of the programme for 1998-2002, with Agency funding support where donor country funds are not available.

2. that a small, standing Coordination Group of National Coordinators should be established to provide regional coordination, management and review of the effectiveness of the Phase 3 activities, and that the group liaise with the RCA Coordinator and the Agency Technical Officer to ensure that duplication or overlap with other programmes, such as the Model Project, UNDP projects and IAEA training activities, if any, be minimized.

3. that terms of reference for the Coordination Group should be developed and all National Coordinators informed by July 31.

4. that the Coordination Group members should initially be those individuals that formed the Task Group for drafting the Phase III Project, and that the first Chairman be Mr. Cameron.

5. that the Coordination Group Chairman be considered the point of contact for the Project on Enhancement and Harmonization of Radiation Protection by the Agency, and specifically the RCA Office.

6. that the Coordination Group draft terms of reference for National Coordinators to encourage their proper selection and participation.

7. that the Agency assure the continued involvement and participation of the present Technical Officer for RAS/9/018 in the Phase III programme for a period long enough to ensure implementation of the Phase 3 project and assure effective interaction with the Technical Cooperation Department.

8. that it is essential for the IAEA RCA Coordinator to attend the Project Formulation Meeting, Mid-term Review, and, when possible, the annual Expert Advisory Group Meetings.

9. that a representative who has attended the annual Project Review Meeting (RCA Coordinator, Coordination Group Chairman or Agency Technical Officer) attend the following RCA Working Group Meeting to assure effective representation of the Project activities during deliberations at that Meeting.

10. that the focus of training activities be to provide trained personnel who will be effective trainers in their home country, and that the Agency bear this in mind in devising the content of any regional training course.

11. that the Agency establish an effective method, through the RCA office or other mechanism, for informing and consulting National Coordinators of training course nominations and other related activities to help ensure that the proper national participants are selected.

12. that the RCA Office should send copies of information on relevant activities in radiation protection to National Coordinators as well as to the Missions.

13. that a list of experts in the region be prepared, that these experts be used in regional activities wherever possible, and that the Technical Officer provide a suitable questionnaire to each National Coordinator to allow such a database to be generated.

14. that support be provided from within the RCA Project to the Model Project in terms of availability of the activities and access to regional resources.

15. that, while recognizing the deliberations during their 1996 Meeting in Beijing, the RCA Working Group once again consider and adopt an appropriate manner to recognize those who have made significant contributions to the conduct and advancement of RCA programmes.

6. CLOSING SESSION

The Meeting closed by expressing its deepest appreciation to the Government of the Republic of Korea for the support given to the Meeting, and to Dr. Song Ho Na and the staff of the Korea Institute of Nuclear Safety (KINS) for the outstanding arrangements and facilities that were provided to help the meeting run efficiently and effectively.

Draft Prospectus

Title:	IAEA (RCA) Regional Training Course on Disposal of Low and Intermediate Level Waste with Emphasis on Non-power Sources
Place:	Nuclear Training Center of Korea Atomic Energy Research Institute, (P.O. Box 105, Yusong, Taejon 305-600, The Republic of Korea)
Date and duration:	14 October - 4 November 1998 (3 weeks)
Deadline for nomination:	10 July 1998
Organizers:	The Government of the Republic of Korea, through the Korea Atomic Energy Research Institute (KAERI) in co-operation with the International Atomic Energy Agency, and under the sponsorship of the Korea International Cooperation Agency (KOICA)
Participation:	The course will be open to 20 participants from the IAEA RCA member states in the Asia and pacific region which have their own nuclear power programme or will have it in the future.
Purpose of the course:	The purpose of the course is to provide the participants with the knowledge of disposal of low and intermediate level waste of non-power sources with emphasis on good practices learned from worldwide experience; define the tasks that are involved; provide a basic understanding of tools, methods, techniques and practices that are used; and introduce them to the areas of work that may be required to perform or direct.
Language:	The language of instruction will be English
Participants' qualification:	Candidates should be senior or middle management professionals with 30-40 years old who work for Governmental authorities or utilities responsible for nuclear energy matters and national industry, likely to participate in a nuclear power project, and who will be involved in radio-waste management. They should have a university education in science, engineering, economic or management and 3-5 years of relevant experience. Prior basic knowledge of nuclear technology and engineering would be helpful.

Nature of the course: The course will consist of lecturers, discussions, small group worksessions and demonstrations. A sicentific visit to nuclear power plants and R&D facilities will also be included. The followings are major contents of the course.

- Introduction and Overview of Waste Disposal
- Principles, Standards and Criteria for Disposal
- Waste Charaterization and Criteria
- Siting, Design and Safety Assessment
- Construction and Operation
- Closure and Post-closure Control Requirements
- Overview of LILW Disposal Management
- Scientific visits to Nuclear Power and R&D Facilities.

Application procedure: Nominations may be submitted on the standard IAEA application form for training courses. Completed forms should be endorsed by and returned through the official channels established (the Ministry of Foreign Affairs, the National Atomic Authority, or the Office of the United Nations Development Programme). They must be received by the International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna, Austria, not later than 10 July 1998. Nominations received after that date or applications which have not been routed through one of the aforementioned channels cannot be considered.

Advanced norminations by facsimile (43-1-20607), telex (1-12645) or e-mail(iaeo@iaea1.iaea.or.at) are welcome. The facsimile/telex/e-mail should contain the following basic information about the candidate: name, age, sex, academic qualifications, present position including exact nature of duties carried out, proficiency in English and full working address (including telex, facsimile and telephone numbers).

A copy of the nomination forms should also be sent to the Host Institute at the address given below;

Nuclear Training Center
Korea Atomic Energy Research Institute
P.O. Box 105, Yusong, Taejon 305-600
The Republic of Korea
Tel : 82-42-868-2675-2678
Fax : 82-42-861-5018, 861-1395

Language certificate: In the case of countries in which English is not an official or customary language, nominations must be accompanied by a separate certificate of the candidate's proficiency in English. This certificate must be issued by a language school, cultural institution or an embassy of a country in which the language of the course is spoken.

Administrative and financial arrangements: Nominationg Governments will be informed in due course of the names of the candidates who have been selected and will at that time be given full details of the procedure to be followed with regard to administrative and financial matters.

The Government of the Republic of Korea through the Korea International Cooperation Agency will, out of its contribution to RCA, pay the costs of the participants' air travel from their home countries to Seoul and return, as well as a stipend sufficient to cover the costs of their accommodation, meals and incidental expenses.

The organizers of the course do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in nominating participants, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

IAEA/RCA Regional Training Course on
Disposal of Low and Intermediate Level Waste
With Emphasis on Non-power Sources
NTC/KAERI , R.O.K., October 1998

Syllabus

1. Introduction

1.1 Waste Disposal Concepts
1.2 Basic Terms and Quantities in Radiological Protection
1.3 Organizational and Responsibility Aspects
1.4 Global Perspective on Waste Disposal
1.5 Korean Activities for Waste Disposal

2. Principles, Standards and Criteria for Disposal

2.1 Basic Concepts of Radiological Protection
2.2 Environmental Considerations
2.3 Safety Principles
2.4 Exemption and Clearance Aspects
2.5 Standards and Criteria

3. Waste

3.1 Waste Classification and Arisings
3.2 Waste Charaterization
3.3 Performance of Waste Packages
3.4 Waste Acceptance Criteria

4. Siting

4.1 Siting Process and Requirements
4.2 Siting Approaches
4.3 Geology
4.4 Hydrology and Hydrogeology
4.5 Geochemistry
4.6 Site Investigation Methodologies

5. Design

5.1 Design Process and Requirements
5.2 Performance of Engineered Barriers
5.3 Conceptual Design
5.4 Design of Unit Systems

6. Safety Assessment

6.1 Safety Assessment Approaches
6.2 Scenario and Pathways
6.3 Groundwater Flow Modelling
6.4 Source Term Modelling
6.5 Geosphere Transport Modelling
6.6 Biosphere Transport and Dose Modelling
6.7 Operational Release Assessment

7. Construction and Operation

7.1 Construction and Operation Requirements
7.2 Waste Receipt and Inspection
7.3 Emplacement
7.4 Waste Tracking
7.5 Inspection and Monitoring

8. Closure and Post-closure Controls

8.1 Closure Process and Post-Closure Control Requirements
8.2 Capping and Sealing
8.3 Remediation Measures

9. Overview of LILW Disposal Management

9.1 Quality Assurance
9.2 Research and Development
9.3 Public Acceptance
9.4 Cost and Financing

10. Discussion

10.1 RCA Member States' Experience and/or Status
10.2 Group Discussion
10.3 Panel Discussion

REGIONAL CO-OPERATIVE AGREEMENT

INTERNATIONAL ATOMIC ENERGY AGENCY

Ref.: A-9-1

WORKING PAPER FOR THE 19TH RCA WORKING GROUP MEETING ON THE IMPLEMENTATION OF RECOMMENDATIONS FROM THE REVIEW OF THE MANAGEMENT STRUCUTRE OF THE RCA PROGRAMME

IAEA-Vienna, February 1997

LIST OF CONTENTS

ATTACHMENTS

WORKING PAPER FOR 19TH RCA WORKING GROUP MEETING ON THE IMPLEMENTATION OF RECOMMENDATIONS FROM THE REVIEW OF THE MANAGEMENT STRUCTURE OF THE RCA PROGRAMME

INTRODUCTION

1. The "Report of the Working Group Meeting to Review the Management Structure of the RCA Programme and Develop Proposals for the Future" (Attachment 1) was considered at the RCA General Conference Meeting on 18 September 1996. Following detailed discussions, the report was agreed in principle. RCA National Coordinators and the Agency Secretariat undertook to provide any further detailed comments by the end of November.

2. The Deputy Director General for Technical Cooperation subsequently circulated a letter dated 29 November 1996 to Member States providing comments on the report on behalf of the TC Department (Attachment 2). The comments from the TC Department are generally positive and supportive of the Working Group Report.

3. Further comments were received from two National Coordinators, Viet Nam (Attachment 3) and New Zealand (Attachment 4).

4. Additionally, at the TACC Meeting on 26 November 1996, Malaysia and New Zealand drew specific attention to the Management Review.

PROPOSAL

5. It is now important to maintain the momentum generated by the above initiatives and discussions. With the 25th anniversary of the RCA Agreement coming up in mid-1997 and the beginning of a new five year term taking it into the new millennium, it would be a positive action to implement as many as possible of the highest priority recommendations from the Management Review so that they can underpin the new phase of the RCA. This would represent a tangible sign of the renewed energy and purpose that will enable the RCA Programme to forge further ahead in meeting its overall objectives.

6. There are two types of recommendations. One relates to changes in the way in which Member States conduct their business within the formal structures laid down by the Articles of the RCA Agreement. These are issues that rely on internal agreement within the RCA or on Member States themselves, and not on any external endorsement in order to be brought into operation. The other recommendations involve the mutual relationship between the IAEA and RCA, and require the concurrence of the IAEA to bring them into operation and make them effective. Some of these recommendations may, for a number of reasons, take a longer time to fully implement. The strong support shown by the IAEA during the review indicates its commitment to supporting the RCA during this period of change and to assist it in implementing these changes in a smooth manner.

7. Notwithstanding the above two types of recommendations, it is apparent that there is broad agreement on almost all the recommendations. From the comments received from the Agency, there are however three matters which merit further discussion at the Working Group Meeting:

Recommendation 1. Clarification of the timing of a Project Formulation Meeting (PFM). This issue was raised by the IAEA in Attachment 2 which considered that a PFM should be held before securing financial support. If however the example of UNDP practice is taken as a reasonable template, the accepted practice is for a project to get funding approval and then these funds be used to facilitate the PFM.

Recommendation 6. The Agency has agreed to present all new project proposals for regional projects to the RCA WGM but does not agree that the setting up of a two tier RCA and non-RCA regional programme should be discouraged. In section 6 of the Report at Attachment 1, RCA projects are described as being more than *just a collection of country projects* and were seen to *have an additional dimension, an RCA "glue"*. In the Agency's comments, it would seem that non-RCA regional projects have been formulated by amalgamating a number of Member States' requests for national projects in the same technological area in order to achieve a more effective utilisation of the Agency's resources. This situation could be thought of as "grouped national projects" rather than "regional projects". These two points of view are not in conflict and with this clarification Recommendation 6 might be acceptable to all parties.

Recommendation 11. In view of the complexities of the issues associated with this recommendation, it is proposed that a specific group of representatives from the Agency and Member States should undertake an in-depth analysis of this recommendation and the associated issues and report to the 26th GCM on 1 October 1997.

8. Subject to the outcome of the above discussion, it is **recommended** that the Working Group Meeting should endorse Recommendations 1-10 and 12 to take immediate effect from a policy objective perspective, with the necessary implementation details being developed where necessary as soon as possible.

9. Following an analysis of all the implications of the Recommendations in the Working Paper, there is one additional Recommendation which is proposed which would greatly streamline the decision making process in RCA and overcome some of the Agency's and Member States' concerns about achieving prompt action once decisions have been agreed. It is **recommended** that the RCA Working Group Meeting should in future become a "Meeting of Representatives", as for the General Conference Meeting, pursuant to Article II of the RCA Agreement.

Mr John Rolland, Australia
(Chairman of RCA Management Review Working Group)

17 February 1997

Attachment 1

REGIONAL CO-OPERATIVE AGREEMENT

INTERNATIONAL ATOMIC ENERGY AGENCY

REPORT OF WORKING GROUP MEETING

TO REVIEW THE MANAGEMENT

STRUCTURE OF THE RCA PROGRAMME

AND DEVELOP PROPOSALS FOR THE FUTURE

11-13 SEPTEMBER 1996
VIENNA

SUMMARY

The Working Group was convened as an outcome of the discussions on RCA management issues at the 18th RCA Working Group Meeting held in Beijing. The participants were as listed at the end of this report and were welcomed by the RCA Coordinator/ Regional Projects Coordinator, Mr. Kazuaki Yanagisawa. Mr. John Rolland of Australia was elected chairman.

The agreed agenda for the meeting is attached to the report.

A summary of the recommendations unanimously agreed by the Working Group follows. **It is essential to consult the main meeting report for the discussion and background leading to the various recommendations.** It is the view of the Working Group that the implementation of these recommendations will facilitate the transfer of considerable management tasks from the Agency to Member States on a cost-effective basis and will further enhance the implementation of TCDC within the RCA Member States.

The contents of this report is commended in the first instance to the RCA General Conference Meeting to be held on 18 September 1996.

RCA Agreement

(1) The RCA Agreement should be extended for a further term on an unchanged basis.

(2) The purpose of the RCA is reaffirmed to be as stated in Article 1 of the Agreement, noting that the scope of the activities carried out will continue to inevitably evolve.

Project Initiation

(1) In future, ONLY a Member State should be able to table a new project proposal. This could either be a single Member State initiative or a group of Member States, but there must be the support of at least three Member States who are committed to it.

(2) A new project proposal must be accompanied by a project document to an agreed format which contains a description of the scientific and technical justifications as well as sustainable development, economic, social and end-use aspects in meeting real regional needs and problems. It should also include advice on project requirements, likely costs and an indication of likely support from target funding body(s) and any discussions held with such body(s).

(3) New project proposals should be prepared at least two months prior to the annual Working Group Meeting for evaluation and prioritisation by that Meeting.

(4) Proposals that are accepted by the Working Group Meeting should be approved for implementation subject to availability of funding. Those that have secured funding support should then be elaborated at a Project Formulation Meeting attended by representatives of each Member State that intends to actively participate in the Project.

(5) RCA approved projects that have secured non-Agency funding may be reviewed by the Department of Technical Cooperation as required but should be exempt from approval by the Board of Governors.

(6) Wherever feasible, Member States should synchronise the submission of new projects with the Agency's biennial programming cycle.

(7) The Agency should be invited to ensure that new RCA projects that are fully funded by Member States or other non-Agency sources may be commenced at any time within its biennial programming cycle.

Project Implementation/Review

(1) The National Coordinators Meeting for each technical project should assume the responsibilities for the Project Committee work set out in Article VI of the RCA Agreement. National Coordinators Meetings in the same thematic area should be held at the same time and location, so that they can consult for thematic review and priority setting.

(2) Arising from the above, the detailed technical review of the RCA Programme would no longer be part of the agenda for the annual Working Group Meeting, which would focus on policy issues, overall management and planning and only deal with the substantive conclusions and recommendations from the NCMs.

(3) The National Coordinators Meeting for each project should be required to produce as part of its meeting report an evaluation of the project and its impact in a format suitable for inclusion in the RCA Annual Report.

(4) The responsibility for production and forwarding meeting reports to the Agency for distribution should rest with the Member State hosting the meeting. To facilitate this, a simple standard format report should be used for all technical meetings (e.g. National Coordinators Meetings, Project Formulation Meetings) and be structured so that it can be readily produced by persons having English as a second language. The body of the report would be produced by an appointed rapporteur and consist of terms of reference; main discussion points (in dot point format); and conclusions and recommendations. Country statements, expert presentations, attendance lists, speeches, etc would be provided by the participants in writing and be included as annexes.

(5) Future RCA Annual Reports should be structured as follows:

- Part 1. A summary of the overall RCA Programme including the financial, managerial and administrative aspects to be produced by the RCA Coordinator's Office.
- Part 2. A report from each National Project Coordinators Meeting or Technical Officer on the overall technical aspects and impact of the past year's work.
- Part 3. A report from each Member State on each of the projects in which they have participated in accordance with an agreed format.

(6) The Agency is invited to consider and implement more flexible procedures for arranging RCA training courses and expert meetings, and for the use of Member States' extrabudgetary funds, to address the practical problems identified in Section C-6 of the report and opportunities for TCDC activities.

(7) A more systematic terminology for RCA programmes, thematic projects and responsible persons be implemented similar to Annex 7.

Increased Field Management

(1) Project Formulation Meetings should consider the increased use of regional experts as the Technical Officer or advisory officer, particularly in circumstances where the Agency is not able to give appropriate support or otherwise provide someone with the specific technical experience required for a project. This could include an expert from a Regional Resource Unit (when established) or an experienced expert with long term knowledge of the subject and of the RCA.

(2) A first stage programme to provide increased regional implementation of selected RCA activities by Member States should be developed on the basis of transparent procedures. These should be transferred for implementation by relevant institutes in Member States or participating international organisations under contract to the Agency. A second stage programme should be designed taking account of the experience gained in the first stage to transfer other implementation functions.

(3) The RCA, with the assistance of the Agency, should develop a strategy to enhance skills within the region for R&D management.

(4) To facilitate the RCA achieving the vision statement outlined in Section C-8 of the report, an objective of the RCA should be to station a senior RCA representative in the Region with a target date of January 2000, with an ongoing Agency interface role remaining in Vienna. The Agency is invited to respond to RCA Member States on the funding, logistics and liaison implications of such a move to assist in determining the final balance of responsibilities between the Region and Vienna.

Programme Coordination

(1) Potential duplication of programmes and activities in the Region should be minimised by maintaining close coordination between the RCA and the East Asia and Pacific Region offices.

(2) Separate RCA and non-RCA programmes should be discouraged except in exceptional circumstances. To increase regional ownership and to take advantage of a collective view of regional priorities, the Agency should submit new regional project proposals to the RCA Working Group Meeting through a group of Member States, via the new recommended procedures, for new project proposals and formulation.

(3) The Agency should be invited to clarify the role of its RCA Steering Committee.

(4) The Agency should be invited to ensure that the duties and responsibilities of the RCA Coordinator/ Regional Projects Coordinator will promote the future directions of the RCA as seen in this report (including Annex 6), the recommendations made in this report and the response from the Agency on the proposed future direction of the RCA. To assist in this, the Agency may see advantage in arranging for an early independent assessment of the role of the RCA Coordinator/ Regional Projects Coordinator within the East Asia and Pacific Section in meeting the RCA's needs.

(5) Each Member State should be invited to review its present system of RCA management to ensure maximum effectiveness, proficiency and sustainability in order to be responsive to the requirements of RCA programmes with special emphasis being placed on the capacity, financial and otherwise, to respond to the introduction of enhanced regional management.

Further Action

There are a significant number of actions and initiatives to be followed up as an outcome of the Working Group meeting. Some involve Member States, while others involve the Agency. In particular, there are several key policy issues requiring a response or comment from the Agency. The Working Group urges the Agency to examine these policy aspects at an early date to enable the identified initiatives to be further pursued on a dialogue basis with RCA Member States.

There is also a set of more detailed recommendation, such as the development of simplified formats for contributions from Member States towards the RCA Annual Report, project proposals, and reports of Project Formulation, Project Committees, and National Coordinators Meetings. When produced, it is suggested that these formats should be incorporated into an RCA Procedures Manual.

REVIEW OF THE MANAGEMENT STRUCTURE OF THE RCA PROGRAMME AND PROPOSALS FOR THE FUTURE

A. INTRODUCTION

The Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (RCA) is an intergovernmental agreement to which some 17 Member States in the area of South Asia, South East Asia and the Pacific and the Far East are currently members (Australia, Bangladesh, China, India, Indonesia, Japan, Malaysia, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, Vietnam).

The objective of this report is to analyse the current management structure of the RCA Programme with a view to determining whether:

- it is consistent with the Articles of the RCA Agreement;
- the interests of Member States are being adequately addressed;
- the structure should be modified to take account of the maturing nature of the RCA Programme; and
- any changes would continue to encourage and facilitate TCDC; provide additional opportunities for increased regional management; and provide improved benefits for RCA Member States.

The cornerstone of this report is the understanding of the RCA Member States that while the RCA is conducted under the auspices of the IAEA, they are solely responsible for the RCA Programme in its entirety, with each Member State having an equal voice in a democratic and transparent decision making process. The IAEA itself is not a signatory to the RCA Agreement.

At the RCA General Conference Meeting in September 1995, Dr Qian, Deputy Director General for Technical Cooperation in his opening remarks stated that *"I would like to suggest the sharing of the responsibilities for running the (RCA) programme. Although it is well demonstrated that the RCA Member States are fully involved in the design, monitoring and evaluation aspects of their programme, the Agency shoulders almost the total burden of coordination, management, organization and implementation. We have to deal with the fine detail of making the projects work and achieving the implementation of the large number of activities. We place great store on providing opportunities for manpower development in the RCA by maximising* the *use of local technical expertise and scientific facilities. I feel that we could greatly increase this manpower development aspect, if Member States took over some of the operational tasks and such a change could only increase the important aspect at the working level. I am anxious to pursue this further and I ask you all to consider how you can assist in increasing and developing further Member States participation throughout the whole of the RCA programme."* At the 18th RCA Working Group meeting in Beijing in May 1996, there was a wide discussion on RCA management issues which was assisted by working papers submitted by Dr Carlito Aleta (Philippines), Dr Peter Roberts (New Zealand) and Mr John Rolland (Australia). The 18th RCA Working Group Meeting agreed to establish a working group consisting of the Member States named at the end of this report *"to study and present possible improvements on RCA's structure and operations for consideration at the 1996 RCA General Conference Meeting"*.

This report represents the unanimous outcome of discussions held at the Working Group Meeting held in Vienna on 11-13 September 1996 which had before it a detailed working paper drafted by Mr John Rolland (Australia) and written contributions circulated at the Meeting by Dr Hasibullah (Pakistan) and Dr Kobayashi (Japan). The development of the working paper drew on the earlier discussions and the previous papers as detailed above.

It is recognised that over the years there has been a maturing of the RCA and of the relationship of the Member States with each other, with the IAEA and with other regional and international bodies. It is inevitable that this will lead to changes in the respective roles and responsibilities of all players and stakeholders. For instance, the relationship between the RCA and the Agency, while of fundamental importance both now and in the future, must continue to be responsive to the changing dynamics of the region. It is therefore likely that, from the point of view of a funding body, the Agency will progressively be joined in the list of project donors by a number of other international organisations and agencies. Future directions for RCA will necessitate interactions with a much wider spectrum of bodies. It is important however for this process of change to be carefully managed so that the capabilities which have enabled the RCA Programme to achieve the significant benefits and successes attained so far are not adversely affected.

On the basis of the analysis detailed in this report, twelve recommendations have been proposed concerning the management and structure of the RCA Programme. Some should occur immediately while others should be phased in over the next three to five years. Specific subjects considered are:

- New Project Proposals;
- Project Review;
- Project Implementation;
- The Working Group Meetings, General Conference Meetings and RCA Annual Reports;
- RCA-IAEA Interaction;
- Increased Regional Management; and
- Future Coordination

B. RCA OUTLINE

It is important to firstly examine and define the purpose of the RCA. Reference needs to be made to the Agreement Articles (Annex 1) but it must be borne in mind that the thirteen Articles only provide guidance on the major points with much of the detail being left to interpretation and established practice. What has evolved as the present RCA management structure and methods has been largely an iterative process driven by the specific requirements of the Member States and the IAEA.

A major focus of the RCA Agreement is to encourage, nurture and support TCDC within the Asia Pacific region. A separate paper has been prepared recently dealing with the current status and future prospects for TCDC in the RCA Programme; this paper was submitted to the Tripartite Meeting held in Vienna on 29-31 July 1996.

1. *Why have an RCA Programme?*

The East Asia Pacific region is a vigorous and dynamic area of the globe encompassing more than half the world's population. Almost all the region's governments have invested strongly in national nuclear programmes over the past 20 to 30 years, with some building up substantial pools of expertise in specific areas of nuclear science and technology in the process. These resources are of high potential value, because the development has occurred under environmental and cultural conditions with a close synergy with each other compared with that existing in Western Europe or North America. The recognition of the potential for pooling of knowledge and cooperation stems from the early 1960s with the Indian-Philippine-Agency Agreement and the seeds from that productive engagement resulted in the establishment of the first RCA Agreement in 1972. Since then the Programme has expanded greatly in terms of both funding and the number of signatories to the Agreement. The successes on both the technical and the TCDC agenda have been so numerous and widely acknowledged that RCA has been held up as the model for such regional cooperation and collaboration.

The formulation of the RCA Programme by its Member States through a process of discussion and consensus is a very sensitive and productive mechanism for the evolution of regional projects. Those with the best direct knowledge and the oversight of the strengths and weaknesses of their own national programmes are able to mould the projects to the appropriate form. Further, the involvement in the RCA Programme of national nuclear centres has brought an added dimension to their own work by expanding horizons and incorporating a focus on what can be additionally achieved through introducing the bonus of a regional component to their projects and activities. These institutes have clearly seen that the RCA has offered enhanced value for their work and added future opportunities for them and others in their country. The RCA Programme has offered one of those rare opportunities where all participants benefit.

2. *What is the purpose of the RCA Programme?*

Article 1 of the RCA Agreement states that *"the Governments Parties undertake, in co-operation with each other and the Agency, to promote and co-ordinate co-operative research, development and training projects in nuclear science and technology through their appropriate national institutions"*. This is the fundamental description of the primary focus of the RCA Programme and this mission objective, with its contributions to the socio-economic development of the Region and its major concentration on TCDC, has been maintained over its 24 year history, achieving significant success and recognition for the high quality of the outcomes. The RCA has often been used as a model for other technical cooperation arrangements.

The Working Group Meeting **confirmed** the previous decision made at the 18th RCA Working Group Meeting that the RCA Agreement should be extended for a further term on an unchanged basis, and **reaffirmed** that the purpose of the RCA should be as stated in Article 1 of the Agreement, noting that the scope of the activities carried out will continue to inevitably evolve.

3. *Who represents the Member States?*

The overall responsibility within Member States for the RCA Programme rests with a National RCA Coordinator who generally attends the annual Working Group and General Conference Meetings. This person is the national interface for all communications relating to the Programme.

At the technical level, a National Project Coordinator is nominated by each Member State participating in a particular project. They have responsibilities as the technical interface for the project as detailed in Annex 2. National Project Coordinators occupy senior positions in their national nuclear programmes and can therefore assist in the practical implementation of RCA projects. Their positions enable them to have informed overviews of their national needs and programmes which are essential to the development of a cohesive RCA Programme.

This structure has proved to be very successful and has allowed very positive contributions to both TCDC and "ownership" of the RCA Programme.

The Agency has established the position of RCA Coordinator/ Regional Projects Coordinator in the Department of Technical Cooperation to assist with the Programme. The current job description as advertised in March 1996 and as currently applicable are given in Annex 3, and the organisational relationships within the IAEA are shown in Figure 1. This report subsequently addresses in section C-8 the fundamental issue as to whether the Coordinator should primarily represent the interests of the RCA in its dealings with the Agency, or alternatively the Agency in its dealings with the RCA.

4. *Who makes the decisions in the RCA?*

As detailed in Article II of the RCA Agreement, the *Meeting of Representatives* (the General Conference Meeting) has the authority to make decisions concerning the RCA Programme. The workload of the General Conference Meeting has been eased by the use of the annual Working Group Meeting as an initial review mechanism which can thoroughly discuss and analyse the various issues and then make recommendations to the General Conference Meeting for approval or endorsement.

It is a working rule that decision-making within the RCA is normally by consensus. Article XI of the RCA Agreement states that disputes *shall be settled through consultations between the parties concerned.* The IAEA is not a signatory to the RCA Agreement and has no formal role in any of the RCA's decision making. Thus the Member States have full autonomy to agree their priorities and their requirements for the projects they choose to have in their Programme, as well as make decisions on any matters covered by the Agreement. Each Member State has an equal voice in decision making.

Although there is an elected Chairperson from a Member State presiding at the RCA Working Group and General Conference Meetings on a rotational basis, these are non-executive positions and do not carry any additional responsibilities outside these meetings. When RCA representation is required, it has been the practice for Member States to select those persons best qualified for the specific needs of the task, rather than be bound to a strict protocol. This has maintained the democratic tradition of the RCA and made the best use of the large pool of talent available. On a number of recent occasions, Member States have formally reaffirmed their support for these arrangements, which have worked well for the past 24 years.

5. *<u>What is the Agency's role?</u>*

Under the RCA Agreement, the Agency provides a number of services which revolve around providing technical advice and secretariat support, implementing the programme activities, dispersing the project funds and providing funding assistance. The detailed list in the Articles of the RCA Agreement include such tasks as: to convene the Meeting of Representatives; to receive the project proposals and assist in their preparation, if requested; to receive notification from Government Parties of their intent to participate in a project; to provide one representative as well as scientific and administrative support for the meetings of the project committee established for each co-operative project; to receive and consider an annual report from each Participating Government on the implementation of their portion of the co-operative project; to perform secretariat duties; to endeavour to support the projects by means of technical assistance and its other programmes; to administer the contributions; to keep separate records and accounts; and to prepare an overall report of the activities carried out under the Agreement.

6. *<u>What makes an RCA project?</u>*

An RCA project has a particular character stemming from its focus on addressing a specific regional need that has been identified during the project development and project formulation process. Each Member State has specific priorities in its national nuclear science and technology programmes and many will have the same or similar topics. However an RCA project is not just a collection of country projects. It has to have an additional dimension, an RCA "glue", that not only binds the national interests together but also gives added value to the outcomes. Most RCA projects also have a strong "end user" focus. Annex 4 lists the RCA projects for 1995-96 and their objectives.

The above aspects of the RCA Programme are not dealt with in the Agreement at all. They have instead evolved from the basic requirement of Articles III and IV, which stipulate that Member States must submit a written proposal to the Agency specifying *the nature and objectives of the proposed co-operative project and the means of implementing it* and once approved by the Meeting of Representatives, it can *start after the receipt by the Agency of the third notification of participation.*

As the RCA Programme has evolved, Member States have recognised the need for progressive change and have adjusted their criteria to lead the way in addressing "end user" focus and the concept of "regionality".

7. *How is an RCA project concept developed to the stage of a full proposal?*

Currently new proposals for RCA projects to be included in the Programme are considered by Member States at the time of the annual RCA Working Group Meeting in March and, if recommended, are submitted for endorsement or otherwise to the RCA General Conference Meeting in September. If this is given, they then become part of the agreed RCA Programme and are normally incorporated into the Agency's TC Programme which is presented to the IAEA Board of Governors for approval. This latter step is not covered by the Agreement and may not be the best mechanism to follow in all cases, especially in an environment where more independence and self-management is transferred to Member States.

Under the present arrangements, the development of an RCA project concept tabled at the Working Group Meeting can take different forms, depending on the detail that accompanies it in the supporting paperwork. Member States are invited to indicate at the Working Group Meeting whether or not they have any initial interest. On this basis, decisions are made on whether to refer it to an IAEA Technical Officer or outside expert, or move it to a Project Formulation Meeting where national experts from interested Member States, assisted if need be by IAEA (or other) experts can "brainstorm" the proposal and prepare a detailed document, which includes objectives, outputs, timetable and a budget.

The Project Formulation Meeting is an essential step since it produces the regional ownership - the national experts who discuss and agree to the proposal are the ones who will be responsible for making it work and achieving the outputs in an efficient and timely manner. This mechanism has worked well over the past four to five years, but now requires further refinement as the RCA Member States move to take on more responsibility for the administration and management of the RCA Programme.

Not all approved RCA projects for the Programme receive funding because of budget limitations. A review mechanism has been agreed whereby projects that have been unfunded for more than two years are considered by the Working Group and General Conference Meetings and, if they are agreed to be no longer a priority, are removed from the Programme.

8. *How are RCA projects monitored and evaluated?*

Currently, each RCA project is reviewed during the technical sessions of the annual Working Group Meeting (the *project committees*). This system does not however provide sufficient time for in-depth technical assessment. For the past five or six years, there has been a programme of National Coordinators Meetings for all RCA projects at which all aspects of the project performance are evaluated and adjustments made to maintain the project focus on priority outcomes for Member States. These are held every 12 to 18 months and have been very successful in not only ensuring that projects are in line with current priorities, but also reinforce the "ownership" commitments of the National Project Coordinators who are the persons in each Member State responsible for making the project a success.

In the case of thematic projects such as Strengthening of Radiation Protection Infrastructure and the joint UNDP Industrial and Environmental Project, monitoring of project outcomes is undertaken annually either by Expert Advisory Group meetings or National Counterparts Meetings, the results of which are reported to the annual Working Group Meetings. This system has been found effective and could be applied to projects in other areas.

When a project has been completed, there is a terminal meeting attended by all National Project Coordinators to review and report on all aspects of the project including implementation, management, administration, outputs and outcomes.

9. *How does the present RCA structure operate?*

There has been some confusion about the relative roles and responsibilities of the various stakeholders in the RCA which needs to be clarified so that there can be continued evolution of the RCA, and so that, with its ongoing maturing, Member States can take on more responsibility for the running of both individual projects and the overall Programme.

In order to clarify and resolve a number of the relationships, it is useful to use a model. An appropriate one might be based on that of a cooperative joint venture or mutually beneficial organisation. The structure of the RCA can be likened to a joint venture which has the objective of providing regional TCDC projects to the Asia Pacific region. The stakeholders are the Member States, with the National RCA Coordinators the equivalent of members of a Board of Directors. The RCA Coordinator has a position similar to the Secretary to the Board. The IAEA fills the role of client, accountant/banker, adviser and provider of services but is not a Board member.

The IAEA's role as banker/accountant is probably more an historic one from the time when it provided all the funds. The Agreement does not oblige the participating Governments (or international organisations) to lodge any overall contribution to the RCA with the Agency but there is a requirement that they *shall notify annually the Agency of any contribution* made to a particular cooperative project, which according to Article V(3) may be financial or otherwise. On the other hand the Agency is required to administer these contributions *in accordance with its financial regulations and other applicable rules* and *keep separate records and accounts for each such contribution* from the participating Governments.

Except for the above roles, the IAEA does not have exclusive rights to other roles and it would seem in the interests of Member States to also look to others for advice, provision of services and clients. For instance, as a move to further increase TCDC in the RCA along the lines outlined in the paper on TCDC submitted to the Tripartite Meeting in July 1996, it may be appropriate to use triangular funding within the RCA to implement some project activities. Developing Member States could be funded to organise and undertake workshops, training courses and the like in other developing Member States on behalf of the RCA Programme.

Other international funding bodies (such as ADB, UNEP, ESCAP and UNDP), RCA Member States, or other approved national governments or associations could be considered as clients and funding arrangements may better serve the interests of Member States on occasions if they did not involve the IAEA directly.

In order to "sell" its services, the "Board" has to produce a product that a client will "buy" and it is essential that it is in tune with the needs of the "market". Thus RCA projects have to be formulated so that they meet both the needs of the Member States and the clients (IAEA, UNDP, etc). If the needs of only one party are met, then the work will fail to achieve the best outcomes.

Based on this model as a simple analogue for the RCA, the following section suggests ways of advancing the interests of the RCA into the future.

C. PROPOSED CHANGES

1. Project Proposals and Formulation

Concern has rightly been expressed about the present project formulation process because of the seemingly unregulated nature of the process. On the Agency side, it has been said that projects must conform to its priorities and procedures, while Member States believe that they should be free to bring forward any project that they feel is important. Both views are correct to some degree. The Agency has a duty to be consistent and follow its own priorities, rules and regulations for projects it funds. However it is submitted that these procedures should not necessarily be applied to projects that the Agency does not fund and that are targeted at other potential donors. If Member States believe that they have a good project that fits the RCA Programme goals, they should be free to seek funding for it from any mutually agreeable source allowed under the Agreement.

Any Project Formulation Meeting set up on the basis of indicative support by a donor other than the Agency would naturally have to address the differences between the requirements of the established IAEA system and those of the potential donor. Many of these organisations have pre-project funding available for the development of projects and the hosting of PFMs.

In dealing with new projects in the future, it is essential that more effort is made to present the RCA with properly constructed project proposals that are justifiable both from scientific and technical points of view as well as from their economic, social and end-use aspects. Member States should have to specify all these factors in the project detail, which should include specifics such as aims, objectives, budget, milestones, inputs, outputs, critical paths, critical success factors and outcomes, all to an agreed format. This means that much more work than at present would need to be undertaken by Member States, either singly or collectively, before advancing new proposals. Initial enquiries should be made to ensure that proposals have a good chance of attracting funding. To this end, new project proposals should be supported by documentation outlining who the likely funding body(s) will be; details of discussions with such bodies; and, some indication of the probability of the proposal being successful. **This will enable the proposal to meet the objective of the RCA Programme to encompass a limited number of high**

quality focused projects which are specifically targeted to meet particular regional needs and priorities in a thematic area and other relevant requirements such as specific funding regulations. This documentation will then be submitted to the Working Group Meeting for formal consideration. A simplified diagram of the new project formulation process is shown in Figure 2.

The above changes are a clear opportunity for Member States to demonstrate their greater role in the RCA Programme. One practical outcome will be to free up the time of the Working Group Meeting to enable more time to be spent on the increasingly important strategic and policy issues that will be on the agenda as part of the growing maturity of the RCA.

The development of a project outline to a proposal will be the responsibility of one or more Member States, as agreed between themselves. This close involvement will be beneficial, because it will develop increased "ownership" and produce "champions" to drive particular projects. In addition it will assist in designing into the projects increased regional management and implementation components.

To facilitate the above changes, National Coordinators will need to communicate more with each other on a routine basis as agreed at the 1996 Working Group Meeting and the "brain storming" that was a feature of some of the formative discussions on new projects at past Working Group Meetings would now take place at National Coordinators Meetings. Installation of e-mail contact between all National Coordinators is an essential prerequisite for effective communication.

RECOMMENDATION 1

It is **recommended** that in future, ONLY a Member State should be able to table a new project proposal. This could either be a single Member State initiative or a group of Member States, but there must be the support of at least three Member States who are committed to it. A new project proposal must be accompanied by a project proposal document to an agreed format which contains a description of the scientific and technical justifications as well as sustainable development, economic, social and end-use aspects in meeting real regional needs and problems. It should also include advice on project requirements, likely costs and an indication of likely support from target funding body(s) and any discussions held with such body(s). New project proposals should be prepared at least two months prior to the annual Working Group Meeting for evaluation and prioritisation by that Meeting. Proposals that are accepted by the Working Group Meeting should be approved for implementation subject to availability of funding. Those that have secured funding support should then be elaborated at a Project Formulation Meeting attended by representatives of each Member State that intends to actively participate in the Project.

2. ***Project Review***

At present, there are two technical reviews of projects, one at the Working Group Meeting as detailed above, while the other is the technical review that occurs every year to year and a half as part of the periodic National Coordinators Meetings. If the NCMs were used as the *project committee* referred to in the RCA Agreement (in place of the current practice of establishing these project committees at the annual Working Group Meeting), they could meet annually to review the projects in accordance with the Agreement. An additional upgrading of the quality of the Programme would come from having all the NCMs for a thematic area held at the same time in the same location with joint sessions so that thematic as well as project priorities could be properly defined. It would also make more effective use of the RCA Coordinator's and National Coordinators' time.

There is currently time pressure to have the Working Group Meeting held in early March or late February. If thematic NCMs were adopted, they could be held in a six month window from November to April. Under the simplified reporting requirements in Recommendation 2, it should be possible to have the meeting reports issued very rapidly and have the Working Group Meeting held in May or June. This would also relieve pressure on the tight timescale for both the Agency and Member States that currently affects the production of the RCA Annual Report.

The reports from the NCMs would be submitted to the National RCA Coordinators for background to the Working Group Meeting **but would not be required to be discussed, except for consideration of any substantive conclusions and recommendations**. This would enable a more effective and efficient conduct of the Working Group Meeting. The specific benefits would be :

- avoiding duplication of meetings and reporting;
- spreading the load of work from the National RCA Coordinators to their national technical experts and simultaneously increasing contacts between Coordinators;
- allowing the National RCA Coordinators to concentrate more on policy issues, overall management and planning, which will become more demanding as the region takes on more responsibility for these aspects;
- more effective and efficient use of regional experts' knowledge and experience, together with a marked increase in their involvement and "ownership" of projects with their increasing role in project oversight and responsibility for the project outcomes.

RECOMMENDATION 2

It is **recommended** the National Coordinators Meeting for each technical project assume the responsibilities for the Project Committee work set out in Article VI of the RCA Agreement and that NCMs in the same thematic area are held at the same time and location, so that they can consult for thematic review and priority setting. As a result, the detailed technical review of the RCA Programme would no longer be part of the agenda for the annual Working Group Meeting, which would focus on policy issues, overall management and planning and only deal with the substantive conclusions and recommendations from the NCMs. It is further **recommended** that the National Coordinators Meeting for each project be required to produce as part of its meeting report an evaluation of the project and its impact in a format suitable for inclusion in the RCA Annual Report.

3. Technical Meeting Reports

The RCA Programme encompasses a large number of varied projects as a consequence of the scope of the Agreement and the needs of its Member States. There is a clear responsibility to have proper documentation in support of such projects to ensure transparency as well as ensuring that all parties are properly informed. The burden of report writing has to date been largely borne by the Agency, in particular the Technical Officers and the RCA Coordinator. In some respects this is justifiable because they are most likely to have the total view of all aspects under discussions as well as important background knowledge.

In some cases, because of gaps in coverage of certain nuclear technology topics, there have been Technical Officers assisting with projects who are not specifically experienced in a particular technology and as a result have had limited input in the reporting process. It is also noted that the Technical Departments are experiencing difficulties in meeting all the demands to provide Technical Officers for the TC Programme. Although it is an option to recruit an expert specifically for a technical meeting, this is not always productive unless that person has had a long association with the project and understands it and the RCA thoroughly.

RECOMMENDATION 3

It is **recommended** that responsibility for production and forwarding meeting reports to the Agency for distribution would rest with the Member State hosting the meeting. To facilitate this, a simple standard format report should be used for all technical meetings (e.g. National Coordinators Meetings, Project Formulation Meetings) and be structured so that it can be readily produced by persons having English as a second language. The body of the report would be produced by an appointed rapporteur and consist of terms of reference; main discussion points (in dot point format); and conclusions and recommendations. Country statements, expert presentations, attendance lists, speeches, etc would be provided by the participants in writing and be included as annexes.

The above change would share around the reporting responsibilities and Member States would benefit from gaining more experience in rapporteuring and would be able to contribute their ideas in the presentational format.

RECOMMENDATION 4

It is **recommended** that Project Formulation Meetings should consider the increased use of regional experts as the Technical Officer or advisory officer, particularly in circumstances where the Agency is not able to give appropriate support or otherwise provide someone with the specific technical experience required for a project. This could include an expert from a Regional Resource Unit (when established) or an experienced expert with long term knowledge of the subject and of the RCA.

4. Working Group Meeting, General Conference Meeting and Annual Report

These three reports are key documents for the RCA and it is important that each is properly prepared and accurate in all details. Up until now these documents have been produced by the RCA Office, sent to the Member States in a draft form for approval and then distributed in final report form. Briefing papers for the Working Group and General Conference Meetings are also prepared by the RCA Office and sent to Member States some six weeks before each meeting.

The Working Group Meeting is concerned with scientific, strategic, management and administrative aspects of the RCA Programme. The Working Group Meeting usually takes place over five days and it has been the normal practice for a draft report to be tabled on the last day so that all delegates can agree the basic text, particularly the conclusions and recommendations. One of the major tasks of the Working Group Meeting up to now has been the technical review of the projects as mandated in the Agreement. This is undertaken by establishing a series of *project committees* under Article VI of the Agreement and is usually a long and involved process because of the input and comments from participating Member States. There is a need to streamline these arrangements and this will be subsequently addressed.

The RCA Coordinator plays a key role in Working Group Meetings and subsequent reporting. The Coordinator is the one person who has the overall picture of the status, progress and implementation of the projects. The role of *Agency representative* on the project committee (as specified in the Agreement) has traditionally been taken up by the RCA Coordinator because their programme knowledge is important in bringing an overall balance to the project discussions and the report, and therefore they have to be involved in the production of the report. At one time the report was solely produced by the Coordinator, but in recent years there have been moves made to lighten the RCA Coordinator's load which requires full participation in the meeting and simultaneously noting and recording the meeting statements. Rapporteurs are now appointed for each of the Technical Sessions and at the 18th Working Group Meeting in 1996 a general rapporteur was appointed. This broadening of reporting should produce a good balance in the final document.

The General Conference Meeting is only a two to three hour meeting held at the Agency in September and the proceedings are taped so that the full text of the discussions can be referred to if required. No rapporteurs are needed. The report is prepared by the RCA Office. A draft document is circulated to Member States for comment and then a final version is distributed to Member States. The preparation of this important document does not involve any significant impost of time or effort by the RCA Office or the Agency.

The RCA Annual Report has to be submitted to the Meeting of Representatives (Article VII (4)) on an annual basis. *The Agency shall prepare annually an overall report on the activities carried out under this Agreement.* Participating Governments have obligations to *submit to the Agency an annual report on the implementation of the portion of the co-operative project assigned to it* and this is contained in their country statements. It has been usual practice for the RCA Office to prepare the Annual Report based on these country statements as well as the reports prepared by the Agency's Technical Officers for each project. This division of responsibilities between the Agency and Member States is unavoidable because the Member States do not have the detailed records that the Agency possesses concerning the financial and implementation aspects of the Programme and the Agency does not have access to the detailed records of the inputs made by Member States, which incidentally could contain a wealth of information on TCDC if rigorously compiled. It goes without saying that neither party could do the work of the other effectively. In conjunction with the 1996 Annual Report, the Agency has sought views on a standardised format for these country reports.

RECOMMENDATION 5

It is **recommended** that future RCA Annual Reports should be structured as follows:

- Part 1. A summary of the overall RCA Programme including the financial, managerial and administrative aspects to be produced by the RCA Coordinator's Office.
- Part 2. A report from each National Project Coordinators Meeting or Technical Officer on the overall technical aspects and impact of the past year's work.
- Part 3. A report from each Member State on each of the projects in which they have participated in accordance with an agreed format.

The above arrangement would bring the responsibility back to each of the three key players in the Programme and each is reporting on a specific area that could not be done efficiently or effectively by another.

5. *RCA-IAEA Interaction*

The IAEA has had in place for some time an RCA Steering Committee with Terms of Reference as at Annex 5. The Steering Committee has an overall objective of overviewing all aspects of RCA activities and, specifically, one of the four detailed task is to *review new proposals and initiatives for presentation at RCA Meetings of*

Representatives. RCA Member States are not informed on the outcomes of meetings of the RCA Steering Committee or represented on the Committee and seek further advice from the Agency on the role of the Committee, especially as there does not appear to be parallel Steering Committees for AFRA or ARCAL.

Although the TC Department has dialogue with individual Member States concerning their country programmes, there is no equivalent forum for the region to bring regional proposals to the Department, except through the RCA. In the interests of transparency in decision making in the TC Programme, as well as the important factor of addressing and achieving "ownership", it would seem beneficial for the Agency to submit all its new project proposals for regional projects to the RCA Working Group and General Conference Meetings to ensure that such projects are focussed on the regionally identified priority areas of the Member States. This would build in the regional "ownership" factor so necessary to achieving successful and sustainable outcomes. As has been noted already, the RCA Member States are able to provide a unique overall view on the needs of the region because of the comprehensive nature of the RCA representation and its networking to all facets of national nuclear needs. Input from the RCA in a review process can only serve to enhance cooperation and collaboration and maximise the efficient and effective use of resources.

A full partnership approach has been the embodiment of the ongoing Agency/RCA relationship. Nevertheless there cannot be efficient and effective utilisation of all regional resources unless consideration is given to the total programmes that are being planned. Further, the establishment of a two tier programme of RCA and non-RCA regional projects has the potential to lead to coordination difficulties and does not seem desirable, especially if it excludes RCA Member States from the decision making process.

RECOMMENDATION 6

It is **recommended** that potential duplication of programmes and activities in the Region be minimised by maintaining close coordination between the RCA and the East Asia and Pacific Region offices. It is further **recommended** that separate RCA and non-RCA programmes be discouraged except in exceptional circumstances. To increase regional ownership and to take advantage of a collective view of regional priorities, it is **recommended** that the Agency submit new regional project proposals to the RCA Working Group Meeting through a group of Member States, via the new recommended procedures, for new project proposals and formulation. It is also **recommended** that the Agency be invited to clarify the role of its RCA Steering Committee.

6. IAEA TC Programming Constraints

There are several aspects where increased flexibility in the management and administration of the Agency's TC Programme would assist RCA Member States in a positive manner.

The first is the requirement that RCA projects must fit in with the timing and priority requirements for the Agency's TC Programme and particularly the difficulty in including new projects in the TC second year of the cycle. For the RCA Programme, which is highly reliant on donor funds and anxious to secure more, it poses real practical difficulties to negotiate for funds and then need to accept constraints, such as a requirement to carry out such a project within the Agency's funding cycles.

There are two other specific points of concern related to the problem of being constrained by the TC biennial programme:

- the RCA Programme cannot respond to any urgent projects or short time scale funding or implementation opportunities;

- because the RCA has currently to anticipate future donor funding and submit project proposals through to the IAEA Board of Governors for approval as part of the TC Programme, there is a risk that some will ultimately not secure all or some of the funds, or that subsequent negotiations with the donor(s) may require major redesign of the project. In either case there could be significant differences between the approved and the actual project, which would create legal and administrative problems. Does the approved project go ahead in name only and risk the implications from not carrying out what has been approved, or does the project get put on hold until the next TC biennium and risk the loss of donor funding?

RECOMMENDATION 7

It is **recommended** that RCA approved projects that have secured non-Agency funding may be reviewed by the Department of Technical Cooperation as required but should be exempt from approval by the Board of Governors. It is further **recommended** that, wherever feasible, Member States should synchronise the submission of new projects with the Agency's biennial programming cycle. It is further **recommended** that the Agency be invited to ensure that new RCA projects that are fully funded by Member States or other non-Agency sources may be commenced at any time within its biennial programming cycle.

A second aspect relates to the rigidity of some of the implementation procedures used by the TC Department. One example relates to RCA training courses where it is not possible to readily pre-select participants for a training event so that there can be structured manpower development towards the establishment of technological sustainability. The problem arises because the TC procedures dictate that notification of the training event must go out to Governments who nominate the participants. Another example concerns meetings (there are a large number designed into the RCA Programme) where it is not possible to organise a meeting through the TC procedures -there is no mechanism to do it. Meetings have to be arranged via expert recruitment procedures and typically involve 17 individual recruitments. This is a very inefficient and time consuming process, especially when compared to the much simpler and faster procedures used by the IAEA's Technical Departments.

RECOMMENDATION 8

It is **recommended** that the Agency be invited to consider and implement more flexible procedures for arranging RCA training courses and expert meetings, and for the use of Member States' extra-budgetary funds, to address the practical problems identified in this report and opportunities for TCDC activities.

7. *Increased Regional Management*

Many institutes have already had practical experience in the hosting of Agency and RCA events such as Working Group Meetings, training courses, expert visits, national coordinator meetings, expert advisory group meetings, group training and the like. It is well within the capabilities of many institutes to manage additional responsibilities, including the provision of course syllabi, recruitment of lecturers, travel and accommodation of participants and lecturers, etc. In the majority of cases it should be possible to identify the responsible individuals/groups in the institute or organisation in sufficient time so that their participation in project activities could be considered at the appropriate policy meetings (Working Group Meetings, National Coordinators Meetings, or similar), along with the associated work plans. A rigorous and transparent evaluation and assessment process would need to be set in place to ensure that all the goals for the activity were met effectively and efficiently and that there was strict accountability for the discharge of the required responsibilities.

This increasing use of regional expertise to implement RCA activities represents a natural progression in the development of the RCA, utilising the skills developed in the region over time to contribute further to cooperation and assistance. The outcome of the changes proposed will give reduced work load benefits to the TC Department, especially the Division of Technical Cooperation Implementation and the RCA Coordinator's Office, in addition to the identified dividends for Member States.

RECOMMENDATION 9

It is **recommended** that a first stage programme to provide increased regional implementation of selected RCA activities by Member States be developed on the basis of transparent procedures. These should be transferred for implementation by relevant institutes in Member States or participating international organisations under contract to the Agency. A second stage programme should be designed taking account of the experience gained in the first stage to transfer other implementation functions. It is further **recommended** that the RCA, with the assistance of the Agency, develop a strategy to enhance skills within the region for R&D management.

8. *Future Regional Coordination Needs*

In the maturing of the RCA Programme, with its increased complexity and emphasis on Member States assuming a greater responsibility for the Programme, it will be increasingly important that the potential funding base be widened to ensure future viability and minimise risk to the Programme's momentum. A heightened profile will need to be created for the RCA with the international funding agencies as well as with other potential donors. Consequently, the RCA will need to obtain ready access to key planners and decision makers in these funding organisations. It will also require a carefully planned and executed strategy to promote and project the achievements and benefits of the RCA Programme to the region. A high level of visibility will have to be achieved at many levels from informal/social occasions through to high level meetings. The forthcoming 25th anniversary of the RCA will provide a positive opportunity to stress these achievements. Unfortunately, this strategy will be unlikely to give results in the short term (less than three years), because of the long lead time required to fit into donors' funding cycles, which are typically three to five years.

In the RCA region "doing business" is strongly bound up with personal contacts and it is unlikely that any desk-bound representative could make sufficient impact or achieve the effective attention of a funding body. Face-to-face interaction is essential, as is the involvement in decision making and policy making meetings. In the lead up to major meetings there are the rounds of discussions, planning and decision making processes where many actions, often with far reaching consequences, are initiated or put into train. **Four important objectives for the vision of the RCA in its new role would be**:

- to be a known, visible and respected part of the region's science and technology community;

- to enjoy a sufficient regional status to readily gain access to regional planners and decision makers;

- to have a strong network of contacts with planners and decision makers in the regional community at the formal and the informal levels; and

- to be in a position to rapidly and easily participate in regional planning and policy meetings from their initiation to their conclusion to maximise the available opportunities for the RCA to contribute to the further development of the region.

While RCA National Coordinators have an important role in achieving the above objectives, it is recognised that the RCA Member States as a whole need to put in place further initiatives in these directions.

Achieving these objectives and completing the general business of the RCA will require strong day-to-day management of RCA activities. The future functions that need to be carried out by the RCA Coordinator are summarised in Annex 6. These are in broad agreement with the duties and functions of the RCA Coordinator as specified in the IAEA Vacancy Notice at Annex 3. However, without wishing to intrude into the

Agency's legitimate responsibilities for managing its own programme, there is concern within the RCA that the ability of the RCA Coordinator to adequately service the RCA's needs has been eroded by recent Agency decisions such as to convert the post to a Regional Projects Coordinator, and to change reporting lines and the position level. These changes come simultaneously with the Agency suggesting that the RCA accept greater responsibility for managing its activities. There is therefore concern about the extent to which the Agency is willing to allow Member States to define or influence the role of the RCA Coordinator. (In this regard it was also noted that a response had not yet been received from the Agency on questions raised at the 18th Working Group Meeting in the paper on Management Issues by the representative of the Philippines.)

From a future perspective, although there could be understandable misgivings by the IAEA to establishing additional regional offices outside Headquarters resulting from possible additional overheads, there would appear in the future to be no practical way of achieving the necessary high degree of regional involvement necessary for the achievement of enhanced funding opportunities from potential donor organisations if the RCA is not strategically represented in the region. The best interests of the RCA would seem to be served if a senior RCA representative is stationed in the future in a major regional centre such as Bangkok (with access to ESCAP) or Manila (with access to ADB) to carry out the roles defined above as well as to provide technical and policy guidance to allow the project frameworks to be outlined during discussions with potential donors. The intense nature of the assignment would mean that it would need to be a full time position. The establishment of such a position would also have a significant side benefit from the large amount of additional TCDC that could factored into the new projects coming into the Programme.

If there is to be future regional RCA representation, then one important question that needs to be resolved is the exact definition of the future functions of the present RCA Coordinator position and the relationship between it and this new regional position. Common understandings are required on key issues such as whether the RCA Coordinator position ultimately requires the Coordinator to safeguard the Agency's interests or that of the Member States.

It is clear that the more independent role envisaged for the RCA as a whole not only means that its Member States should become less dependent on the infrastructure of the Agency for running the Programme, but also that the Agency needs to allow Member States the flexibility to take on increased responsibilities. Both sides have to loosen the ties in order for the process to work.

RECOMMENDATION 10

It is **recommended** that the Agency be invited to ensure that the duties and responsibilities of the RCA Coordinator/ Regional Projects Coordinator will promote the future directions of the RCA as seen in this report (including Annex 6), the recommendations made in this report and the response from the Agency on the proposed future direction of the RCA. To assist in this, the Agency may see advantage in arranging for an early independent assessment of the role of the RCA Coordinator/ Regional Projects Coordinator within the East Asia and Pacific Section in meeting the RCA's needs.

RECOMMENDATION 11

It is **recommended** that to facilitate the RCA achieving the vision statement outlined above, an objective of the RCA should be to station a senior RCA representative in the Region with a target date of January 2000, with an ongoing Agency interface role remaining in Vienna. It is further **recommended** that the Agency be invited to respond to RCA Member States on the funding, logistics and liaison implications of such a move to assist in determining the final balance of responsibilities between the Region and Vienna.

RECOMMENDATION 12

It is **recommended** that each Member State be invited to review its present system of RCA management to ensure maximum effectiveness, proficiency and sustainability in order to be responsive to the requirements of RCA programmes with special emphasis being placed on the capacity, financial and otherwise, to respond to the introduction of enhanced regional management.

Mr J Rolland, Australia (Chairman)
Prof A Djaloeis, Indonesia
Mr S Nagayoshi, Japan
Dr S Kobayashi, Japan
Dr Nahrul Khair, Malaysia
Dr P Roberts, New Zealand
Dr Hasibullah, Pakistan
Dr C R Aleta, Philippines
Dr Prinath Dias, Sri Lanka

13 September 1996

ATTACHMENTS

	Agenda for Working Group Meeting
Annex 1	Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology, 1987
Annex 2	A Summary of the Duties and Responsibilities of National Coordinators
Annex 3	RCA Coordinator/Regional Projects Coordinator - Duties and Responsibilities
Annex 4	RCA Projects 1995 - 1996
Annex 5	RCA Steering Committee - Terms of Reference
Annex 6	Management of Future RCA Activities
Annex 7	RCA Programmes, Projects and Responsible Persons Terminology
Figure 1	Dept of Technical Cooperation - Division of Technical Cooperation Programme - East Asia and Pacific Section Organisation Chart
Figure 2	Schematic of "Idea to New Project"

AGENDA FOR WORKING GROUP MEETING TO REVIEW MANAGEMENT STRUCTURE OF THE RCA PROGRAMME AND DEVELOP PROPOSALS FOR THE FUTURE

11-13 SEPTEMBER 1996

1. Opening remarks by the RCA Coordinator

2. Election of Chair

3. Ageement to Agenda

4. Opening Remarks of Chair

5. Brief Overview of the Working Paper on the Management Structure for RCA by Mr J Rolland (Australia)

Working Session I

6. Establishment of a definition of RCA
    - 6.1 Why have an RCA Programme?
    - 6.2 What is the purpose of the RCA Programme?
    - 6.3 Who represents the Member States?
    - 6.4 Who makes the decisions in the RCA?
    - 6.5 What is the Agency's role?
    - 6.6 What makes an RCA Project?
    - 6.7 How is an RCA Project concept developed to the stage of a full proposal?
    - 6.8 How are RCA projects monitored and evaluated?
    - 6.9 What are the problems in the present structure?
    - 6.10 Other matters to be defined

Working Session II

7. Definition of changes proposed
    - 7.1 Project Formulation
    - 7.2 Technical Meeting Reports
    - 7.3 Working Group Meeting, General Conference Meeting and Annual Report
    - 7.4 Project Review
    - 7.5 RCA-IAEA Interaction
    - 7.6 IAEA TC Programming Constraints
    - 7.7 Increased Regional Management
    - 7.8 Future Regional Coordination Needs
    - 7.9 Other changes

Working Session III

8. Preparation of Conclusions and Recommendations

Working Session IV

9. Preparation of Meeting Report

Working Session V

10. Concluding Session
    - 10.1 Acceptance of the Meeting Report
    - 10.2 Closing remarks - IAEA
    - 10.3 Closing remarks - Chair

TC:

REGIONAL CO-OPERATIVE AGREEMENT FOR RESEARCH, DEVELOPMENT AND TRAINING RELATED TO NUCLEAR SCIENCE AND TECHNOLOGY, 1987

WHEREAS it is a function of the International Atomic Energy Agency (hereinafter referred to as the "Agency") to encourage and assist research on, and the development and practical application of, atomic energy for peaceful uses, which function can be fulfilled by furthering co-operation among its Member States and by assisting them in their national atomic energy programmes;

WHEREAS the Governments Parties to this Agreement (hereinafter referred to as the "Governments Parties") recognize that, within their national atomic energy programmes, there exist areas of common interest wherein mutual co-operation can promote the more efficient utilization of available resources; and

WHEREAS, under the auspices of the Agency, the Governments Parties desire to enter into a Regional Agreement to encourage such co-operative activities;

NOW, THEREFORE, it is agreed as follows:

ARTICLE 1

The Governments Parties undertake, in co-operation with each other and the Agency, to promote and co-ordinate co-operative research, development and training projects in nuclear science and technology through their appropriate national institutions.

ARTICLE II

1. There shall be a meeting of representatives of the Governments Parties (hereinafter referred to as the "Meeting of Representatives") to be convened by the Agency. The Meeting of Representatives shall be held as required and, at least, once every year. Each representative may be accompanied by alternates, experts and advisers.

2. The Meeting of Representatives shall have the authority:

(a) to determine a programme of activities and to establish priorities therefor;
(b) to consider and approve the co-operative projects proposed in accordance with paragraph 1 of article III;
(c) to review the implementation of the co-operative projects established in accordance with paragraph 2 of article III;
(d) to co-ordinate the activities of the project committees established in accordance with article VI;
(e) to consider the annual report submitted by the Agency pursuant to paragraph 4 of article VII; and
(f) to consider any other matters related to or connected with the promotion and co-ordination of co-operative projects for the purposes of this Agreement as set forth in article I.

ARTICLE III

1. Any Government Party may submit a written proposal for a co-operative project to the Agency, which shall, upon receipt thereof, notify the other Governments Parties of such proposal. The proposal shall specify, in particular, the nature and objectives of the proposed co-operative project and the means of implementing it. At the request of a Government Party, the Agency may assist in the preparation of a proposal for a co-operative project.

2. In approving a co-operative project pursuant to paragraph 2(b) of article II, the Meeting of Representatives shall specify:

(a) the nature and objectives of the co-operative project;
(b) the related programme of research, development and training;
(c) the means of implementing the co-operative project and verifying the achievement of project objectives; and
(d) other relevant details as deemed appropriate.

ARTICLE IV

1. Any Government Party may participate in a co-operative project established in accordance with article III, by means of a notification of participation to the Agency, which shall notify the other Governments Parties of such participation.

2. Subject to paragraph 2 of article VII, the implementation of each co-operative project established in accordance with article III may start after receipt by the Agency of the third notification of participation in the co-operative project.

ARTICLE V

1. Each Government participating in a co-operative project in accordance with article IV (hereinafter referred to as "Participating Government") shall implement the portion of the co-operative project assigned to it in accordance with paragraph 3(b) of article VI. In particular, each Participating Government, subject to its domestic laws and regulations, shall:

(i) make available the necessary scientific and technical facilities and personnel for the implementation of the co-operative project; and
(ii) take all reasonable and appropriate steps for the acceptance of scientists, engineers or technical experts designated by the other Participating Governments or by the Agency to work at designated installations,and for the assignment of scientists, engineers or

technical experts to work at installations designated by the other Participating Governments for the purpose of implementing the co-operative project.

2. Each Participating Government shall submit to the Agency an annual report on the implementation of the portion of the co-operative project assigned to it, including any information it deems appropriate for the purposes of this Agreement.

3. Each Participating Government, subject to its domestic laws and regulations and in accordance with its respective budgetary appropriations, shall contribute, financially or otherwise, to the effective implementation of the co-operative project and shall notify annually the Agency of any such contribution.

ARTICLE VI

1. There shall be established a project committee for each co-operative project.

2. The project committee shall consist of one representative from each Participating Government and one representative from the Agency. They may be accompanied by advisers.

3. The functions of the project committee shall be:

(a) to determine details for the implementation of each co-operative project in accordance with its objectives;
(b) to establish and amend, as necessary, the portion of the co-operative project to be assigned to each Participating Government, subject to the consent of that Government;
(c) to supervise the implementation of the co-operative project; and

(d) to make recommendations to the Participating Governments and to the Agency with respect to the co-operative project, and to keep under review the implementation of such recommendations.

4. The project committee shall meet as required and, at least, once every year.

ARTICLE VII

1. The Agency shall perform secretariat duties under this Agreement.

2. Subject to available resources, the Agency shall endeavour to support co-operative projects established in accordance with article III by means of technical assistance and its other programmes. Any such assistance shall be provided, mutatis mutandis, in accordance with the principles, rules and procedures governing the provision of technical assistance by the Agency.

3. On the basis of recommendations made by the project committee for a co-operative project pursuant to paragraph 3(d) of article VI and in consultation with the project committee, the Agency shall:

(a) establish annually a schedule of work and modalities for the implementation of the co-operative project;
(b) allocate among the Participating Governments the contributions made in accordance with paragraph 3 of article V and paragraph 1 of article VIII;
(c) consider the annual reports submitted by the Participating Governments on the implementation of their portions of the co-operative project pursuant to paragraph 2 of article V;
(d) assist the Participating Governments in the exchange of information and in compiling, publishing and distributing reports on the co-operative project, as appropriate; and
(e) provide scientific and administrative support for the meetings of the project committee.

4. On the basis of the annual reports submitted by the Participating Governments pursuant to paragraph 2 of Article V and in consultation with them, the Agency shall prepare annually an overall report on the activities carried out under this Agreement, with particular reference to the implementation of the co-operative projects established in accordance with Article III, and submit it to the Meeting of Representatives.

ARTICLE VIII

1. With the consent of the Meeting of Representatives, the Agency may invite any Member State other than the Participating Governments or appropriate international organizations to contribute financially or otherwise to, or to participate in, a co-operative project. The Agency shall inform the Participating Governments of any such contributions or participation.

2. The Agency shall administer the contributions made pursuant to paragraph 3 of article V and paragraph 1 of this Article for the purposes of this Agreement, in accordance with its financial regulations and other applicable rules. The Agency shall keep separate records and accounts for each such contribution.

ARTICLE IX

1. In accordance with its applicable laws and regulations, each Government Party shall ensure that the Agency's safety standards and measures relevant to a co-operative project are applied to its implementation.

2. Each Government Party undertakes that any assistance provided to it under this Agreement shall be used only for peaceful purposes, in accordance with the Statute of the Agency.

3. Neither the Agency nor any Government or appropriate international organization making contributions pursuant to paragraph 3 of article V or paragraph 1 of article VIII shall be held responsible towards the Participating Governments or any person claiming through them for the safe implementation of a co-operative project.

ARTICLE X

Any Government Party to this Agreement and the Agency may, where appropriate and in consultation with each other, make co-operative arrangements with appropriate international organizations for the promotion and development of co-operative projects in the areas covered by this Agreement.

ARTICLE XI

Any dispute which may arise with respect to the interpretation or application of this Agreement shall be settled through consultations between the parties concerned, with a view to the settlement of the dispute by negotiation or by any other peaceful means of settling disputes acceptable to them.

ARTICLE XII

Any Member State of the Agency in the area of South Asia, South East Asia and the Pacific or the Far East according to the Statute of the Agency may become a Party to this Agreement by notifying its acceptance thereof to the Director General of the Agency.

ARTICLE XIII

1. This Agreement shall enter into force upon receipt by the Director General of the Agency of the second notification of acceptance in accordance with article XII. In the event such notification is received by the Director General of the Agency prior to the expiration of the Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology of 1972, as extended in 1977 and in 1982, this Agreement shall enter into force on the date of expiration of the said Agreement. With respect to Governments accepting this Agreement thereafter, it shall enter into force on the date of receipt by the Director General of the Agency of the notification of such acceptance.

2. This Agreement shall continue in force for a period of five years from the date of its entry into force.

3. The co-operative projects established under the Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology of 1972, as extended in 1977 and in 1982, which are being implemented as of the date of entry into force of this Agreement, shall be considered as co-operative projects under this Agreement.

DONE in Vienna, on the second day of February 1987, in the English language.

Existing responsibilities of RCA National Co-ordinators

A SUMMARY OF THE DUTIES AND RESPONSIBILITIES OF NATIONAL CO-ORDINATORS.

The network system of National Co-ordinators that has been set up as part of the RCA Programme has been very beneficial in achieving efficient, effective and appropriate use of resources for Member States needs. All RCA Technical Projects now have National Co-ordinators in recognition of their strong beneficial role.

National Co-ordinators act as the interface between the Agency and the end users of a technology in their country and it is important that there is a two way flow of information to enable the project to be responsive to changing needs and imperatives. It is the National Co-ordinators duty to actively pursue developments in the particular area of technology, establish and maintain links with individuals and, where they exist, professional societies or interest groups and keep them informed and involved in the Agency's programme. These country inputs should be relayed back to ensure that the Agency is up-to-date in its appreciation of the local situation. All this National effort is part of the obligations countries make under the RCA. Article V(I) states that each participating Government will "make available the necessary scientific and technical facilities and personnel for implementation of the co-operative project".

The choice of National Co-ordinator is very important since much of the vitality and the viability of the projects at the National level will be directly bound up in this selection.

The periodic National Co-ordinators Meetings are an essential part of the total project management since this forum allows all Co-ordinators to gain from direct face-to-face contact with the Agency Technical Officers and project managers and also from the sharing of the experiences of their opposite numbers in other RCA Member States. It is at these Meetings that the technical decisions and recommendations are made for the project and these are arrived at by consensus. If a Member State is not represented then it is difficult for their views and needs to be thoroughly represented.

R C A Coordinator

DUTIES AND RESPONSIBILITIES

In general:

The RCA Co-ordinator is responsible for the performance of the IAEA Secretariat duties required under the Articles of the Regional Co-operative Agreement for Research, Development and Training related to Nuclear Science and Technology (RCA). The duties involve extensive contacts with RCA Member States' officially designated counterparts to achieve the co-ordinated design, development and implementation of the programme as well as negotiation with Governments and appropriate international organizations, such as UNDP, to secure the financial resources to support the approved programme. In addition to the RCA responsibilities, the RCA Co-ordinator is also responsible for the management of other regional projects with the East Asia and Pacific Region which are part of the Agency's Technical Co-operation Programme activities. The RCA Co-ordinator reports to the Section Head of the East Asia and Pacific Region.

In particular:

- To prepare, maintain, review and refine the detailed project management plans for each project for the consideration of the RCA Member States in collaboration with the officially designated counterparts. This includes the arrangement of and participation in meetings concerned with the projects management and the overall programme and the preparation of the subsequent meeting reports;
- To negotiate with Governments and international organizations for financial support for the agreed RCA projects as permitted by the Articles of the Agreement;
- To promote and inform on the RCA programme generally and encourage Agency Member States within the defined geographical area to become a party to the Agreement;
- To undertake the necessary actions to ensure that project resources are used in an efficient and effective manager and that the programme is implemented in accordance with the Articles of the Agreement;
- to discharge non-RCA regional and other duties in the Division of Technical Cooperation Programmes as may be required from time to time;
- To supervise the RCA Office and assign tasks and provide guidance to the staff to enable the work to be fulfilled;
- To monitor critically the performance of all projects and initiate appropriate actions to deal with observed problems and difficulties;
- To maintain close contact with the national co-ordinators.

(Taken from IAEA Vacancy Notice No. 95/048, 11 March 1996)

DEPARTMENT OF TECHNICAL CO-OPERATION

DIVISION OF TECHNICAL CO-OPERATION PROGRAMMES

Offices of the Regional Project Co-ordinators,
Africa Section,
East Asia and Pacific Section,
Latin America Section

Mission Statement:

The mission of the co-ordinators offices is to prepare a programme of regional projects to be implemented with the co-operation of the IAEA in Member States of Africa, East Asia and Pacific, and Latin America and the Caribbean regions respectively and to assist and advise Member States participating in the Regional Co-operative Agreements in the preparation of their regional projects.

Organizational Element:

The offices of the Regional Projects Co-ordinators report to the respective Section Heads, Division of Technical Co-operation Programmes in the Department of Technical Co-operation.

Functions:

a) To administer the regional programmes of the IAEA and the regional agreements adopted by Member States in accordance with RCA and AFRA Agreements, or ARCAL Guidelines, as appropriate.

b) To assist the Member States in obtaining extrabudgetary support for the implementation of projects under the Regional Co-operative Agreements, and to ensure that the funded projects are administered in terms of the agreements and understanding reached with donor countries.

c) To assist in the preparation and organization of regional meetings of representatives of RCA/ARCAL/AFRA/Members States in co-operation with the President/Chairman of the Regional Co-operative Agreements and the National Co-ordinators.

d) To organize, direct and supervise the staff of the office.

e) To maintain close contact and to brief representatives of Permanent Missions on matters related to the preparation and implementation of regional projects, as well as regarding to Member States' participation in the regional activities.

f) To assist the respective Area Section on day-to-day matters.

RCA PROJECTS 1995 - 1996

TITLE	PROJECT NUMBER	OBJECTIVE
Development of TCDC in Asia and the Pacific (RCA)	RAS/0/015	To foster technical cooperation among developing countries (TCDC) in the nuclear field.
Nuclear Information System (RCA)	RAS/0/019	To produce a regional system of nuclear information centres that will permit the sharing of information resources.
Nuclear Power Planning (RCA)	RAS/0/021	To facilitate national implementation of nuclear power programmes through the pooling and analysis of information on effective strategies used in RCA Member States.
Public Acceptance and Trade in Irradiated Food (RCA)	RAS/0/022	To promote wider acceptance by the public and free circulation of irradiated food within and among countries in the region.
Energy, Electricity and Nuclear Power Planning (RCA)	RAS/0/023	To further promote regional cooperation among RCA countries in the field of energy, electricity and nuclear power planning, in particular, for improving the reliability and quality of forecasting, planning and analytical capabilities.
Nuclear Instrument Maintenance (RCA)	RAS/4/008	To strengthen regional and national infrastructures in nuclear instrument maintenance and repair.
Research Reactor Utilization (RCA)	RAS/4/011	To assist institutes in the RCA Member States operating research reactors to make optimum use of these facilities, including the provision of irradiation services and the production of radioisotopes, and to facilitate collaboration and cooperation between the institutes concerned.
Radioimmunoassay for Hepatitis B Diagnosis (RCA)	RAS/6/18	To establish inexpensive, simple and reliable methods based on bulk reagent methodology and radioisotopic microanalytical techniques for the diagnosis of viral hepatitis.
Strengthening Nuclear Medicine in RCA Member States	RAS/6/022	To achieve more effective use of nuclear medicine technology, promote further development of nuclear techniques in medicine and enhance health care in the region.
Radiation Sterilization of Tissue Grafts (RCA)	RAS/7/003	To build up the regional and national infrastructure, through harmonized and standardized procedures, for production of radiation sterilized tissue graft materials and to support the technology through appropriate technical and promotional initiatives.
Isotopes and Radiation in Industry and Environment (RCA)	RAS/8/068 RAS/8/069 RAS/8/070 RAS/8/071	To promote the use of isotope and radiation technology for environmentally sustainable development.
Strengthening of Radiation Protection Infrastructures (RCA)	RAS/9/006	To strengthen the radiation protection infrastructure in support of industrial activities and health services in the region.

ANNEX 5

RCA STEERING COMMITTEE

Terms of Reference

The Steering Committee will overview all aspects of RCA activities. Specifically it will:

a) ensure that initiatives proposed for RCA are in compliance with the Agreement;

b) approve or, as appropriate, endorse budgets for presentation to the Agency or donor countries;

c) review new proposals and initiatives for presentation at RCA Meetings of Representatives; and

d) ensure that the Agency is correctly informed of significant RCA events.

MANAGEMENT OF FUTURE RCA ACTIVITIES

The following broad functions must be managed for the successful implementation of future RCA activities:

- Implementation of RCA Projects as approved by the Annual Working Group and General Conference Meetings
  - ⇒ Project formulation and budgeting
  - ⇒ Scheduling of activities
  - ⇒ Technical and scientific support for meetings, workshops, etc
  - ⇒ Reviewing the progress of projects, their achievements, impacts and budgets
  - ⇒ Facilitation of TCDC

- Outreach
  - ⇒ Promotion of the RCA within the region
  - ⇒ Recognition of the RCA as a major provider of R&D in the region
  - ⇒ Increasing funding from non-IAEA, non-nuclear agency sources

- Liaison
  - ⇒ Liaison with East Asia and Pacific Section, IAEA Technical Departments and Technical Officers, Experts and Training Sections, national RCA representatives and coordinators, RRUs, and individual experts within and outside the region

- Enhancing the ability of the RCA to be self-managing

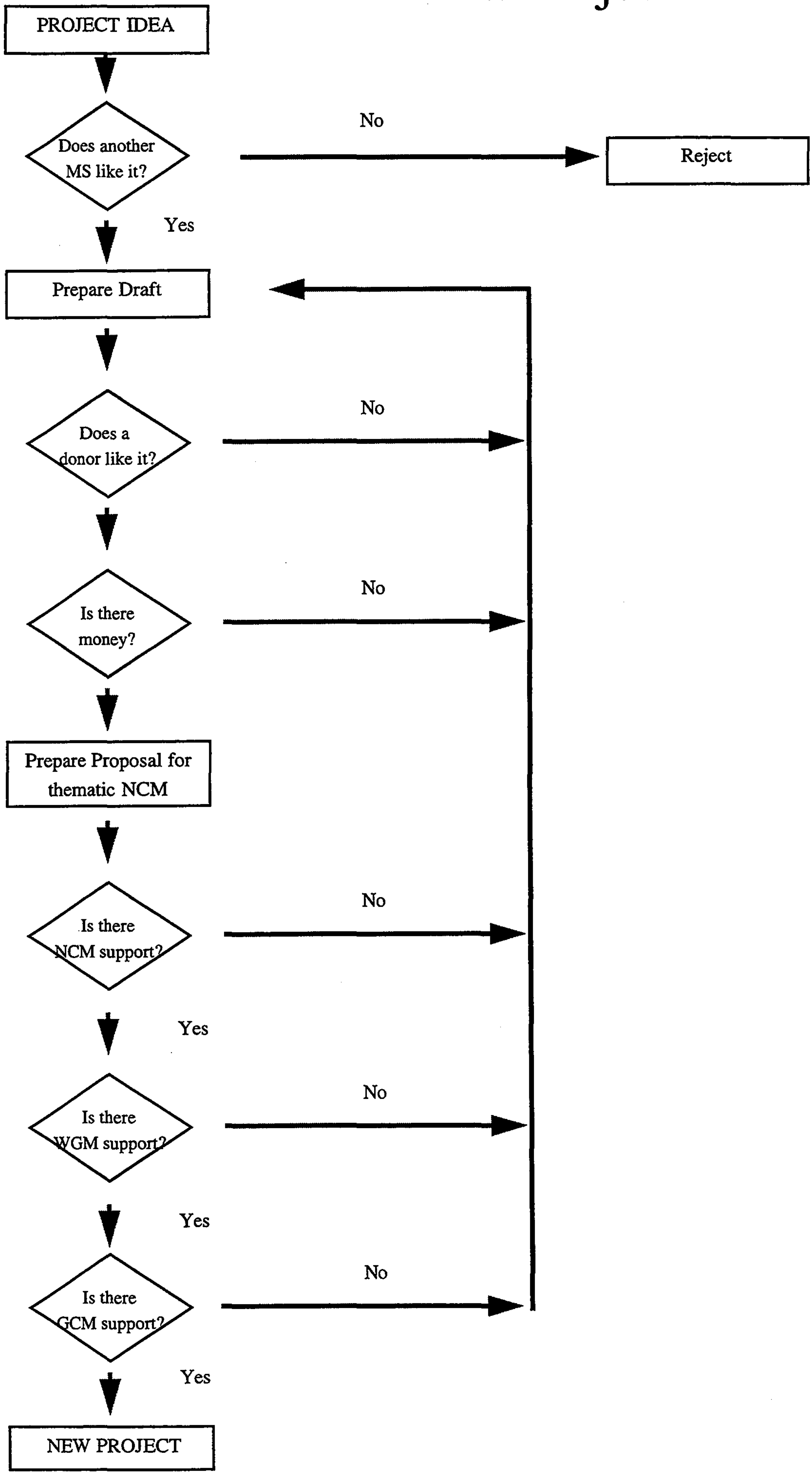
- Administration
  - ⇒ Preparing and producing material for the RCA Annual Report, and annual Working Group and General Conference Meetings
  - ⇒ Assessment of meeting and other activity reports
  - ⇒ Assessment of Project Committee reports
  - ⇒ Completion of mid-term (or equivalent) reviews
  - ⇒ On-going review of costs versus budgets

- Implementation of the recommendations in this Working Group report

A number of people and groups will be involved in ensuring that the above functions are effectively carried out. However one senior and full-time person should have the oversight and responsibility for their completion.

Idea to New Project

FIGURE 2



8/12/96 ideaproj

Attachment 2

INTERNATIONAL ATOMIC ENERGY AGENCY
AGENCE INTERNATIONALE DE L'ENERGIE ATOMIQUE
МЕЖДУНАРОДНОЕ АГЕНТСТВО ПО АТОМНОЙ ЭНЕРГИИ
ORGANISMO INTERNACIONAL DE ENERGIA ATOMICA

WAGRAMERSTRASSE 5. P.O. BOX 100, A-1400 VIENNA, AUSTRIA
TELEX: 1-12645, CABLE: INATOM VIENNA, FACSIMILE: 43 1 20607, TELEPHONE: 43 1 2060, E-MAIL IAEO@IAEA1.IAEA.OR.AT

IN REPLY PLEASE REFER TO:
PRIERE DE RAPPELER LA REFERENCE:

DIAL DIRECTLY TO EXTENSION:
COMPOSER DIRECTEMENT LE NUMERO DE POSTE:

1996-11-29

Dear Mr. ,

Subject: **Report of the Working Group Meeting to Review the Management Structure of the RCA Programme and Develop Proposals for the Future**

I refer to the attachment to my letter of 25 November 1996 regarding comments on the Report of the Working Group Meeting to Review the Management Structure of the RCA Programme and Develop Proposals for the Future.

Due to an oversight the unedited version of the document was inadvertently attached to that letter. The edited version is herewith attached.

I apologize for the inconvenience that our mistake may have caused you.

Yours sincerely

QIAN Jihui
Deputy Director General
Head of the Department of Technical Co-operation Programmes

This letter was sent to all RCA Co-ordinaors as per attached list

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TC DEPARTMENT COMMENTS TO "REPORT OF WORKING GROUP MEETING TO REVIEW THE MANAGEMENT STRUCTURE OF THE RCA PROGRAMME AND DEVELOP PROPOSALS FOR THE FUTURE"

A. INTRODUCTION

Page 5, Para. 3

In the third paragraph it is indicated that *"the RCA Member States are the ones solely responsible for the RCA programme in its entirety"*.

Until now, the initiation, formulation, preparation, implementation, and follow-up of projects has been carried out by the Technical Officers and RCA Co-ordinator. RCA Member States participated in the activities arranged by the Agency. Therefore, we welcome this statement and urge RCA to start its implementation as soon as possible.

Page 6, Para. 2

"It is therefore likely that from the point of view of a funding body the Agency will progressively be joined in the list of project donors by a number of other international organizations and agencies. Future directions for RCA will necessitate interactions with a much wider spectrum of bodies."

We also welcome this position. Indeed, the Agency is already assisting RCA with its interaction with other international organizations such as UNDP and funding agencies such as the Asian Development Bank, etc. We support this direction and we hope that in the near future there will be many other donors to the RCA activities. This is in line with the policy stated on many occasions that the Agency should be viewed as a donor among others and it should not be taken for granted that it would support <u>all</u> the project proposals by the RCA.

B. RCA OUTLINE

Page 7, Para 1, line 1

"A major focus of the RCA Agreement is to encourage, nurture and support TCDC within the Asia Pacific Region".

This is not reflected in the implementation of the activities. Many of the expert missions are carried out by experts from the developed countries. Also the number of persons trained in developing Member States was very small and should be increased.

included in the proposal do not involve the "end user". Perhaps a review has to be carried out to ensure that the RCA projects give a clear indication of the "end user". Indeed, at the Beijing meeting held this year, the need to involve the "end users"at the earliest stage of the project design was discussed.

Page 10, Para. 1 ***7. How is an RCA project concept developed to the stage of a full proposal?***

The report states that projects endorsed by the RCA representatives during the RCA General Conference meeting *"are normally incorporated into the Agency's TC Programme which is presented to the IAEA Board of Governors for approval."*

This is not entirely correct. Perhaps in the past it has been the practice that such projects were automatically added to the TC programme. It should be noted, however, that by September of a Programme year the TC programme for the next cycle is already completed and funds allocated. Therefore, we would like very much to have such endorsements and the full project document prepared long before (latest by July) the General Conference meeting, in order to identify those projects which the Agency would be prepared to fund. The practice of reserving a certain proportion of funds for activities which are not yet precisely defined, must be discontinued. The availability of a well prepared proposal with a detailed implementation plan and budget requirements will be a *sine qua non* condition for consideration for funding by the Agency.

Page 10, Last Para. ***8. How are RCA projects monitored and evaluated?***

We agree that the technical session of the National Project Co-ordinators' Meeting which takes place every twelve to eighteen months, be considered from now on as the "Project Committee" described in the Agreement.

Page 11, Para. 2 ***8. How are RCA projects monitored and evaluated?***

The report states that *"When a project has been completed, there is a terminal meeting attended by all National Project Co-ordinators to review and report on all aspects of the project including implementation, management, administration, outputs and outcomes."*

We agree and support this statement and we urge the RCA Member States to undertake this review and report on all aspects of the project including its implementation, management, administration, outputs and outcomes.

Page 11, Para. 4 ***How does the present RCA structure operate?***

We do not agree that the Agency *"fills the role of a client, accountant/banker, adviser and provider of services"*.

As indicated before, the Agency's major role in the RCA is to assist Member States to facilitate the implementation of projects and the provision of Secretariat services. The Agency's role is technology transfer, therefore it can assist with technical matters and advice only It is certainly not a client nor a provider of services.

Page 11, Last Para. ***How does the present RCA structure operate?***

We believe that on no occasion did the Agency claim to have *"exclusive rights to all the roles"*. We are quite happy with the role as defined in the text of the Agreement.

C. PROPOSED CHANGES

Page 12, Para 1. ***1. Project Proposals and Formulation***

"On the Agency's side, it has been said that projects must conform to its priorities and procedures, while RCA Member States believe that they should be free to bring forward any project that they feel is important. The Agency has a duty to be consistent and follow its own priorities, rules and regulations for projects it funds."

We certainly support the idea that if the RCA feels a project is important it should be formulated. The IAEA insists, however, that for those projects that RCA intends to submit to the Agency for possible funding, they should conform to its priorities and procedures. Our procedures (including appraisal by technical divisions and by TC) extend to all activities and it is difficult to make exceptions. The priorities are those that have been identified through contact with national authorities, Country Programme Framework missions, thematic planning and national requests, etc. Unless we follow the procedures for receiving, appraising, funding and evaluating the projects, it will be very difficult to harmonize the implementation of the programme. AFRA, ARCAL and RCA activities which become part of the TC programme are no exception.

Page 12, Para 5, line 4

"... have pre-project funding available for the development of projects and hosting of PFMs." This is a very good suggestion. However, in recent times only the Agency has funded such activities. One example is the recent proposal prepared for submission to UNDP to develop proposals which could form a basis to approach donors.

Page 13, Para 2, line 1

"The above changes are a clear opportunity for Member States to demonstrate their greater role in the RCA Programme." We welcome the proposed changes.

Page 13 ***Recommendation 1***

We agree and are ready to implement the recommendation as it is. However, the statement: *"Proposals that are accepted by the Working Group Meeting should be approved for implementation subject to availability of funding.*

Those that have secured funding support should then be elaborated at a Project Formulation Meeting...", should be clarified.

As indicated above, we feel that any organization including the Agency, that needs to decide on funding a project, must be informed of all the details of the project implementation (activities), the chronology for disbursements and total resources required. Therefore, in our opinion the Project Formulation Meeting should precede the securing of financial support.

Page 15 ***Recommendation 2***

We agree fully.

3. Technical Meeting Reports

Page 15, Para 1.

It is correct that *"the burden of report writing has to date been largely borne by the Agency and in particular the Technical Officers and the RCA Co-ordinator."*
However, we do not feel this is justifiable as indicated in the report, because the projects are implemented in the Member States by the Member States and our interaction is limited to certain activities. The management is not in the Agency but in the countries where the activities are implemented. The RCA Co-ordinator and Technical Officers direct interaction to the project is limited to their visits to the site and processing papers at headquarters. Therefore, the total view of all aspects under discussion in such meetings, as well as important background knowledge of the national activities is much more in the hands of the Project Managers than of the RCA Co-ordinator or Agency's Technical Officers.

Page 15 ***Recommendation 3***

We agree. The proposed change of responsibility for production and forwarding meeting reports to the Member States hosting the meeting is welcome.

Page 16 ***Recommendation 4***

We agree.

Page 16, Last Para. ***4. Working Group Meeting, General Conference and Annual Report***

"The role of the Agency representative on the project committee (as specified in the Agreement) has traditionally been taken up by the RCA Co-ordinator".

This is correct with respect to the context of the sentence which is the responsibility in the preparation of the report resulting from the Working Group Meetings. However, the Agency representative to the Working Group Meeting could be other staff than the RCA Co-ordinator. We plan to participate in future Working Group Meetings with additional staff involved in policy making issues in addition to those covering the technical issues. This will be also true for AFRA and ARCAL.

Page 17, Para. 1 ***4. Working Group Meeting, General Conference and Annual Report***

Previous meetings during the General Conference since 1993 have always been longer than two or three hours. Indeed, this year the meeting lasted from 8:30 a.m. until after 1:30 p.m. We feel that these meetings should be streamlined and have an agenda that could be dealt with in a minimum of two hours.

Page 17 ***Recommendation 5***

We agree.

Page 17, Last Para. ***5. RCA-IAEA Interaction***

We are discussing internally the need for an RCA Steering Committee. This Committee was established in 1987 in order to assist the Secretariat with the RCA programme. Its members consist mainly of staff from Technical Divisions. It is an Agency mechanism for internal consultation with the people that are involved in the administration and technical backstopping of the RCA activities. As such, it is not part of the RCA management.

At the last meeting of the Committee which took place on 14 October 1996, the role and the need for the Steering Committee was again discussed. The Committee decided by consensus that there are other mechanisms for internal consultations between TC and technical divisions and therefore, there was no need to continue its activities. As a consequence, it was decided that the Committee will be discontinued at the end of 1996.

Page 18, Para. 2 ***5. RCA-IAEA Interaction***

We agree to present all *"new project proposals for regional projects to the RCA Working Group"*.

These regional activities outside the RCA Agreement originate from the following:

a) National requests received during the TC programming year which essentially address the same problem. For cost effectiveness and management efficiency they are managed together as a regional project.

b) Opportunities detected by the Agency during the visits to the region by programming missions, visits of TOs and AO.

We would very much like RCA to identify opportunities and prepare a project, supported by Member States, rather than the Agency to take the initiative.

The statement that *"the RCA Member States are able to provide a unique overall view on the needs of the region because of the comprehensive nature of the RCA representation and its networking to all facets of national nuclear needs"* seems to strong.

We should develop a mechanism that would avoid that both the RCA and the Agency miss good opportunities for developing good projects. An additional problem is that an Agency regional project proposal may not be supported by all RCA Member States. What would happen then? Should we stop processing it or should the Agency undertake its implementation with the interested Member States only? We certainly support the concept of full partnership and we are ready to share with the RCA any activity which could develop into a regional programme. However, the Agency cannot wait too long for a decision of RCA Member States to support a particular proposal, since our project preparation schedule is very tight.

Page 18 ***Recommendation 6***

We agree that potential duplication of programmes and activities in the region should be minimized by maintaining close co-ordination between the RCA and the East Asia and Pacific Region Section. This was one of the aspects which was considered when deciding to bring the RCA office directly under the Head of the East Asia and Pacific Section as we had identified some duplication of on-going activities. However, we do not agree that separate RCA and non-RCA regional programmes should be discouraged. We do believe, as it is the case in the present programme cycle, that certain activities are important and have been requested by countries as national projects, such as geothermal energy studies. Another good example is that in 1992, RCA did not give high priority to agriculture projects. The Agency however received such requests from several Member States of the region. Since the requests submitted by the individual Member States were similar, the Agency grouped them together and created a project to serve all the requesting Member States.

Since these activities were not identified by the RCA Co-ordinators as priorities for the region, but the individual countries requested them, the Agency should be in a position to respond to these needs. The fact that the RCA Co-ordinators do not identify opportunities, does not mean that these opportunities do not exist. On the other hand, the Agency has no problem in following the recommendation that new project proposals of regional character be submitted to the RCA Working Group Meeting for consideration. It is hoped that this will not delay the process of appraising, upstream work, project design and budget preparation required before finalization of the programme, and submission to TACC and the Board of Governors for approval.

Page 18, Last Para. ***6. IAEA TC Programming Constraints***

We are in favour of increasing the flexibility in the management and administration of the TC programme. This has been a long-standing endeavour in co-operation with the Administration Department and some progress has been achieved.

Page 19 **Recommendation 7**

We have no problem with this recommendation provided UNDP is the funding Agency. Indeed any UNDP supported project (without Agency contribution) can start implementation at any time. Similarly, if there is funding from other multi-lateral aid organizations, we could use this existing modality for implementation. In these situations there will be an overhead charge (currently 22% for UNDP projects). In case of Member States' funding it would be necessary to go to the Board for approval, except when additional resources are added to an existing (and approved) project. It should also be noted that, if justified, a new project could be submitted to the Board at any of their regular meetings.

Page 19, Last Para. and Page 20 **6. IAEA-TC Programming Constraints**
Recommendation 8

We are not aware that TC implementation procedures are more rigid than the ones used by the technical divisions. We have followed up this matter and could not identify any difference. The procedures used by TC are not as rigid as seen by Member States. On many occasions we have demonstrated a great deal of flexibility in accepting requests from Member States and RCA has been a major beneficiary of this; we are flexible in utilizing funds provided by the Agency to accept requests from Member States which have not signed the Supplementary Agreement for the provision of technical assistance, even though there should be no possibility for these countries to receive TC; Member States can readily propose candidates for a particular training course since RCA training courses are related to the programme/project. Member States participate in the project formulation and draw up the activities which include training courses. Furthermore, when the Agency announces the RCA training courses, the Agency sends the announcement through the National RCA Co-ordinator and not through the TC Liaison Officer as is the case with other Agency training courses.

The organization of any meetings of TC or of technical divisions is always a problem because of the lengthy negotiations that are required with the host country. There are problems associated with the issuance of visa for participants, insurance and other administrative aspects. We are ready, however, to identify places where more flexibility could be introduced.

Page 20, Para 2, Line 4

"It is well within the capabilities of many institutes to manage additional responsibilities, including the provision of course syllabi, recruitment of lecturers, travel and accommodation of participants and lecturers, etc." The

Agency appreciates this capability and has acted upon by engaging in subcontracts with these Member States.

Page 20, Para 2, Line 10

"A rigorous and transparent evaluation and assessment process would need to be set in place to ensure that all the goals for activity were met effectively and efficiently and that there was strict accountability for the discharge of the required responsibilities." This we understand falls under the responsibility of the Regional Management.

Page 20 ***Recommendation 9***

Recommendation 9 is also most welcome. This is a direction which we hope will be more and more emphasized in future activities. In this case, the institution under contract will be responsible for the implementation of the project and a partner to the Agency as well as to the recipient country. This mechanism will bring a new dynamism into the system.

Page 21, Para 1, line 4 ***8. Future Regional Coordination Needs***

"A heightened profile will need to be created for the RCA with international funding agencies as well as with other potential donors." This is a good proposal. The Member States have to take an active role to ensure that a good profile is created with the respective funding Agencies.

Page 21, Para 2, line 3

"Face-to-face interaction is essential, as in the involvement in decision making and policy making meetings." The suggestion is good. It is up to the Member States to participate in this exercise. The Agency has had a profile with other International Organizations and has established good working relationships with many of them, such as, UNDP, UNESCO, FAO, etc. We would do whatever is necessary to lend support to this initiative.

Page 21, Para 4, line 2

"The future functions that need to be carried out by the RCA Co-ordinator are summarized in Annex 6." Annex 6 (Management of the Future RCA Activities) suggests mechanisms and functions for the entire RCA management process and not specifically the functions of the RCA Co-ordinator. The Co-ordinator's functions are defined in the RCA Agreement. As in the last paragraph of Annex 6, a number of people and groups will be involved in this management process. This involvement should be defined.

Page 21, Last. Para.

To achieve the objectives derived from the vision of the RCA in its new role, it will indeed require a strong day-to-day management of RCA activities. We support this position. However, it was also noted that the future functions of the RCA Co-ordinator cannot be different to those specified in the Agreement The RCA Member States should not be concerned if the Agency delegates additional regional tasks to the RCA Co-ordinator if they do not interfere with his/her work with the RCA. Such additional tasks are assigned within the normal workload distribution of the Division of Technical Co-operation Programmes. We do not think it will ever be the case that the RCA Co-ordinator cannot provide sufficient support to RCA activities due to being assigned other regional tasks. We therefore do not agree that *"the ability of the RCA Co-ordinator to adequately service the RCA needs has been eroded by recent Agency decisions such as to convert the post to a Regional Projects Co-ordinator and to change reporting lines and the position level."* In this respect, it should be noted that the last paragraph on page 22 *"it is clear that the more independent role envisaged for the RCA as a whole not only means that its Member States should become less dependent on the infrastructure of the Agency for running the Programme"* is the correct position, and is in contradiction to the concerns expressed in the first paragraph of the same page.

Page 22, Para. 2 ***8. Future Regional Coordination Needs***

Concerning the proposal that *"it would be in the best interest of the RCA to have a Senior RCA Representative stationed in the future in a major regional centre such as Bangkok or Manila"*, we are in agreement and would like to support it. This regional office and the person designated to manage it should not, however, replace nor carry out the work expected from the National Co-ordinators. Our assumption is that the person designated to this regional office will be a representative of RCA and not necessarily a staff member of the IAEA. If RCA decides to establish such an office then the relationship between the Agency, RCA Co-ordinator and this RCA office should be studied and defined. The financial implications should also be defined.

Page 22, Para 4

"Its Member States should become less dependent on the infrastructure of the Agency for running the Programme, but also that the Agency needs to allow Member States the flexibility to take on increased responsibilities." As indicated before, this proposal is welcome.

Page 22 ***Recommendation 10***

We agree with this recommendation and will undertake a revision of the duties and responsibilities of the RCA Co-ordinator to make sure that they are in line with what has been identified in the Agreement.

Page 23 ***Recommendation 11***

This recommendation will require in-depth internal consultations by the Agency and by the RCA Member States. At the moment with so many uncertainties as to the advantages and disadvantages, the role and relationship of this office with the Agency and in the management of the project, it becomes very difficult to comment, on logistics and liaison implications for such a move. We are ready, however, to start immediate consultations with the RCA on the relevant aspects of this recommendation.

VIỆN NĂNG LƯỢNG NGUYÊN TỬ VIỆT NAM

VIETNAM ATOMIC ENERGY COMMISSION

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Hanoi, December 10, 1996

086111

Subject: Report of the Working Group Meeting to Review the management Structure of the RCA Programme and Develop Proposals for the Future.

Referring to the above report, the following comments are presented as reflecting the opinion of RCA member state and National Coordinator.

From the general point of view, the re-examination of the RCA management structure on the cost effective basis is most welcome. However, as the RCA agreement is extended unchanged for another term, the new structure should be in complete compliance with the Agreement.

Taking account of this condition, the following points are commented in some detail.

Recommendation 1-

The restrictive condition "ONLY a member state should be able to table a new project proposal" should further limit the scope of proposals as each project must already be supported by 3 member states and subjected to availability of funding. It is proposed to change to "a member state or IAEA or Regional UNDP Office...".

Recommendation 2-

We agree.

Recommendation 3-

We agree that "responsibility for production and forwarding meeting reports to the Agency for distribution would rest with the member state hosting the meeting" but in co-operation with the RCA project coordinator or his/her representative for the content of the report.

Recommendation 4-

We agree.

Recommendation 5-

We agree.

Recommendation 6-

We agree the idea but if duplication still exists, for funding purpose a consensus should be found to build up a bigger programme instead of selecting only one.

Recommendation 7-

We agree.

Recommendation 8-

No comment.

Recommendation 9-

We agree.

Recommendation 10-

As the role and responsibilities of RCA coordinator are specified by RCA agreement and in the same time he must fulfill Agency staff member's obligation, we wish that all working condition and relative independence be provided by the Agency as in the past.

Recommendation 11-

We welcome the idea, but the point is due to limitation of budget for RCA activities, if such a regional representative is planned, the average of cost of living in the region, or the reasonable cost of living in the host country, should be taken into account in order to establish a cost effective evaluation for its activities.

Recommendation 12-

No comment.

With best wishes for the development of RCA programme.

Yours sincerely

NGUYEN TIEN NGUYEN
National Coordinator

Mr. Kazuaki Yanagisawa
RCA Coordinator
TCPM, IAEA

Institute of
GEOLOGICAL
& NUCLEAR
SCIENCES
Limited

08 January 1997

Mr Qian Jihui
DDG-TC
IAEA
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PO Box 100
A-1400 VIENNA
AUSTRIA

Dear Mr Qian

Agency Comments of the Report of the Working Group Meeting to Review the Management Structure of the RCA Programme

Thank you for the Agency's comments. They are constructive and positive, and indicate a high degree of agreement on the future direction of RCA Management between Member States and the Agency.

The issue is of sufficient importance that I provide below a point-by-point response, mostly very short. This letter will be copied to Mr Rolland to assist him with any discussion document to be tabled at the next RCA Working Group Meeting scheduled for March.

First, however, three general comments on the key issues for future discussion. I believe these to be:

1 Further clarification of the responsibilities for, and implementation of, the functions identified in Annex 6 of the report as necessary for management of future RCA activities. As noted in Agency comments, these functions relate to the entire management process and not necessarily just the functions of the RCA Coordinator.

2 As an extension of point one, the possible role of a senior manager stationed in the region and the manager's relationship with a Vienna-based RCA facilitation service run by Agency staff needs much further debate.

3 The funding implications of the above and all the recommendations made in the Report. In the longer term, far greater responsibility in the Region must mean greater financial commitment from the Region. The issues are how to make progress, how the Agency can assist and how Member States, each with differing financial constraints, can respond.

My point-by-point response to the Agency comments refer to the page/para/line numbering sequence in the Agency letter.

Page 5, Para 3

Noted and agreed

Page 6, Para 2

Welcomed

Page 7, Para 1, Line 1

This comment is too harsh. There has been inadequate notification of some TCDC activities to the Agency and the statistics do not necessarily reflect the full contribution of RCA activities to regional cooperation.

Page 8, Para 2

Agreed, but it is often difficult to balance the need for National Coordinators to have sufficient seniority within Institutes to be effective and the inevitable other responsibilities that follow such seniority.

Page 8, Para 4 and 5

Agreed that the Agency has autonomy over activities it funds, and that the RCA Coordinator must safeguard the interests of both Member States and the Agency. The broader comments on the RCA Coordinator's role are at the centre of some present difficulties in the relationship between Member States and the Agency. The statement that 'the Agency (and therefore the coordinator) has no formal role .....' is correct. It would also be naive to ignore the de facto power that the position holds in the interim by virtue of the overview obtained on all activities and through responsibilities for managing funds and coordinating all activities. The thrust of the Report is to move towards placing day-to-day management in the hands of Member States rather than the Agency, but this has not happened yet.

Page 9, Para 3, Line 7

The need for 'end user focus' in RCA activities is now acknowledged by all parties. The practicalities of this concept concern some National Coordinators and some Agency staff. It may be noted that despite such concerns the initial UNDP proposal submitted to the Agency by Member States and the Agency-appointed consultant had a very strong end user focus. The first activity for all objectives was to set up a group to design, implement and monitor all activities and this group was to include end user representatives. Subsequent modification to dilute and delay direct involvement of end users were initiated by Agency staff.

Agency staff concerns may have been justified in so far as the initial proposal required that high level and full time commitment to liaison with several user groups within the region commence immediately. Given the Agency position on the Coordinator's role and that the Report's recommendation about a senior RCA representative in the region is yet to be implemented, such liaison would be difficult at present.

Page 10, last para	Welcomed
Page 11, Para 2	Welcomed
Page 11, Para 4	The report uses terms like 'client' and 'provider' in a way that is now common usage in science policy in some countries. The Agency comments may reflect its sensitivity to the issues involved. We submit the Agency does provide a service (coordination of activities, etc), it does advise RCA (through its representations at meetings etc). It holds the purse strings (as required in the Agreement) and is a client in that it agrees to fund certain outcomes. The Report statement is consistent with the concepts of the RCA a) becoming less reliant on the Agency, b) regarding the Agency as just one of several possible sources of support and c) being sub-contracted by the Agency for tasks currently undertaken by the Agency. These are all concepts the Agency supports.
Page 11, last para	Noted
Page 12, Para 1 *(Note, actually para 3)*	The Agency is correct, but should note that the intent of the Report was directed at gaining more flexibility when non-Agency funds were involved. For example, this could involve new ways of dealing with some forms of extra-budgetary funding from Member States.
Page 12, Para 5, Line 4	Noted
Page 13, Para 2, line 1	Noted
Page 13, Recommendation 1	Agreed; the difficulty is often to secure funding for Project Formulation meetings. It can be a 'chicken and egg' situation.
Page 15, Recommendation 2	Welcomed.
Page 15, Para 1	The Agency position is accepted. Again the difficulty is in the period before the Report is implemented. Background knowledge of <u>national</u> activities is indeed in the hands of National Coordinators. Bringing all national activities together into a regional view is most cost-effective when done by one central office. At present to leave this overview to the 17 National Coordinators of each activity would be high cost and of variable effectiveness.
Page 15, Recommendation 3	Welcomed
Page 16, Recommendation 4	Welcomed

Page 16, Last Para Noted

Page 17, Para 1 Agreed, but the last two General Meetings have dealt with substantive issues. A shorter meeting should be possible with a more 'executive' role played by the WGM.

Page 17, Recommendation 5 Welcomed

Page 17, Last Para Welcomed

Page 18, Para 2 The agreement to present all new project proposals for regional projects to the RCA WGM is welcomed. Agency concern about missing opportunities to develop good projects should be allayed since

- an RCA project only requires agreement of 3 states
- RCA has, in the new UNDP project proposal, agreed to work within sub-regional groupings or just with a few technically competent States. That is, all 17 States need not be involved in all activities
- Agency projects must backstop whole areas of work that RCA does not pick up (eg Agriculture) but even here RCA may have felt that existing Agency projects supply sufficient effort and have tried to initiate work in other areas).

The principle discussed is a good one, and requires only the will to communicate effectively.

Page 18, Recommendation 6 Previous comments apply

Page 18, Last Para Welcomed

Page 19, Recommendation 7 Welcomed

Page 19, last para and Page 20, Recommendation 8 We must accept your comments, and we are pleased that the Agency is prepared to consider even greater operational flexibility.

Page 20, Para 2, Line 4 Welcomed

Page 20, para 2, Line 10 Noted

Page 20, Recommendation 9 Welcomed

Page 21, Para 1, Line 4 Welcomed

Page 21, Para 2, Line 3 Noted

Page 21, Para 4, Line 2 Agreed

Page 21, Last Para	It is possible that there is a difference in interpretation of the role of the RCA Coordinator as defined in the agreement between Member States and the Agency. Progress may best be made by moving forward on other related recommendations.
Page 22, Para 2	Agreed, and the initial general comments of this letter also refer here.
Page 22, Para 4	Welcomed
Page 22, Recommendation 10	Noted, but we hope that the agency will undertake a review in consultation with Member States and which considers the Report recommendations as a whole.
Page 23, Recommendation 11	Noted, and again the general comments at the start of this letter are applicable.

Once again, our thanks for the prompt and helpful response.

Yours sincerely

P B Roberts

Peter B Roberts

REGIONAL CO-OPERATIVE AGREEMENT

INTERNATIONAL ATOMIC ENERGY AGENCY

Ref.: A-6-2

REVIEW OF THE MANAGEMENT STRUCTURE OF THE RCA PROGRAMME

DRAFT GUIDELINES AND OPERATING RULES

PREPARED FOR 19TH RCA WORKING GROUP MEETING
10-14 MARCH 1997
YANGON, MYANMAR

H.S.C.
1997-03-04
s:\drafts\rcagdlns

IAEA-Vienna, March 1997

The management structure of the RCA programme has been extensively discussed and reviewed over the past two years by Member States and by the IAEA Secretariat. If the RCA programme is to continue to meet the needs of the countries in the region and address their priorities, it must be responsive to the dynamic changes that are taking place in the region, in the Agency and in organizations around the world co-operating and providing support to the RCA programme.

The **Working Group on the Review of the Management Structure of the RCA Programme** recognized that "the thirteen Articles (of the Agreement) only provide guidance on the major points with many of the details being left to interpretation and established practice. What has evolved as the present RCA management structure and methods has been largely an iterative process driven by the specific requirements of the Member States and the IAEA".

The attached **Guidelines and Operating Rules for the RCA Programme** transpose the recommendations made by this Working Group and contained in its report of 13 September 1996 into concrete and practical rules to guide all stages of the development, approval, implementation and evaluation of the RCA programme.

A common and clear understanding of all the steps in the complex process leading to an effective co-operation among RCA Member States and the Agency for the promotion and co-ordination of research, development and training in nuclear science and technology is essential for the success of the RCA programme. The role and responsibilities of each participant in the programme have to be well defined and well understood by all participants and contributors to the programme, particularly the decision-makers, the co-ordinators, the country representatives and the senior management of national and international institutions. As noted in the report of the Working Group, "there has been a maturing of the RCA and of the relationship of Member States with each other, with the IAEA and with other regional and international bodies. It is inevitable that this will lead to changes in the respective roles and responsibilities of all players and stakeholders".

The attached document tries to establish the roles and responsibilities of the RCA Member States and the IAEA at this stage of the evolving relationships among all players in the RCA programme. The National RCA Representatives are invited to review it and propose any changes deemed necessary for its improvement and further clarification of the RCA process.

The following issues concerning the RCA management structure need to be discussed by the Working Group Meeting in Myanmar:

1. Procedures and time frames for the development, approval, implementation and review and reporting of RCA project needs to be agreed upon, particularly in relation to the Agency's technical co-operation programme procedures and time frames. Particular attention should be paid to the clarification of the timing of Project Formulation Meetings (PFMs) and how these meetings are to be funded;

2. The approach to RCA and non-RCA projects in the technical co-operation programme of the Agency needs to be explained and clarified. Procedures for the development and implementation of these two types of projects now exist and need to be compared;

3. Standardization of the format of different reports (annual reports, reports of different National Project Co-ordinators Meetings, reports of Research Co-ordination Meetings) is an essential part of streamlining the process for decision-making. These formats, if they do not already exist, need to be developed;

4. Programme and project categories as they appear in Annex 7 of the report of the Working Group on RCA Management Structure (attached) need further clarification to avoid extraneous complications in the approval process of RCA projects;

5. The presence of a senior RCA Representative in the region by January 2000 was recommended in the report of the Working Group on RCA Management Structure. The role and responsibilities of such a representative, his relations with National RCA Representatives and the Agency's RCA Co-ordinator need to be defined and adapted to the RCA programme rules and procedures. The implications of such a move also need to be assessed.

DRAFT

GUIDELINES AND OPERATING RULES FOR THE RCA PROGRAMME

H.S.C.
1997-03-04

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1. THE RCA AGREEMENT

1.1. NATURE OF THE AGREEMENT

The Regional Co-operative Agreement for Research, Development and Training (RCA) is an intergovernmental agreement established under the auspices of the IAEA. It is open to the participation of any Member State of the Agency in the area of South Asia, South East Asia and the Pacific or the Far East. A Member State from one of these regions may become a party to this Agreement by notifying its acceptance thereof to the Director General of the Agency.

1.2. MISSION

THE GOVERNMENTS PARTIES TO THE RCA AGREEMENT UNDERTAKE, IN CO-OPERATION WITH EACH OTHER AND THE AGENCY, TO PROMOTE AND CO-ORDINATE CO-OPERATIVE RESEARCH, DEVELOPMENT AND TRAINING IN NUCLEAR SCIENCE AND TECHNOLOGY THROUGH THEIR APPROPRIATE NATIONAL INSTITUTIONS.

1.3. BASIC PRINCIPLES

The implementation of the RCA Agreement shall be governed by the following principles:

(a) The formulation of the RCA programme is to be done by its Member States with the assistance of the Agency, if required, through a process of discussion and consensus;

(b) Member States have full responsibility and autonomy to agree on their priorities and the projects to be included in the programme;

(c) Project proposals to be included in the RCA programme must be justifiable in terms of their scientific and technical merits as well as from their economic, social and end-user aspects. They must be specifically targeted to meet particular regional needs and priorities which must address specific regional problems, and use appropriate nuclear technologies to provide solutions;

(d) Each Member State shall use the assistance provided to it under the RCA Agreement solely for peaceful purposes, in accordance with the Statute of the Agency;

(e) In accordance with its applicable laws and regulations, each Member State shall ensure that the Agency's safety standards and measures relevant to a co-operative project are applied to its implementation;

(f) Co-operation activities undertaken in the framework of the RCA Agreement shall promote Technical Co-operation among Developing Countries (TCDC) in the RCA region;

(g) The formulation, design and implementation of the RCA co-operation programme and projects shall make extensive use of available regional expertise and existing institutions and facilities.

1.4. RCA PROGRAMME

The co-operation programme in the framework of the RCA Agreement may cover subjects in the fields of nuclear energy, nuclear safety, waste management, and isotope and radiation applications in agriculture, human health, industry, hydrology and terrestrial and marine environments.

The programme contains co-operative research, development and training projects divided into two categories:

- Co-operative projects, designed to meet the needs of development and practical applications of, and of research on, atomic energy for peaceful purposes. These co-operative projects may include one or several of the following components:

  - services of experts, consultants and scientists;

  - fellowships, scientific visits, training courses, study tours;

  - equipment and supplies;

- Co-ordinated Research Projects (CRPs). They are essentially networks of national research institutions which work within an operational framework for research with a similar and well defined regional theme or problem focus that is relevant to, or can be resolved through, nuclear technology.

2. ROLE OF RCA MEMBER STATES

Member States parties to this Agreement have equal rights in the decision-making process of the RCA programme.

2.1. ROLE AND OBLIGATIONS OF RCA MEMBER STATES

Member States have the following role and responsibilities under the RCA Agreement:

(a) Make available to the RCA programme, and in particular to each joint project in which it participates, such physical infrastructure and personnel as it may have initially proposed and as is necessary to achieve the stated objective;

(b) Take the necessary measures to ensure that personnel from other participating States and from other Agency Member States are able to participate effectively in the activities carried out on its territory, and also to ensure that its own nationals are able to take part in activities that are to be carried out in other States;

(c) Contribute financially or otherwise to the effective implementation of the RCA programme and the various co-operative projects, in particular those in which it participates and shall notify the Agency annually of any such contribution;

(d) Submit to the Agency an annual report on all aspects of the activities it has carried out in the framework of the RCA programme, particularly the technical and financial aspects;

(e) Decide upon the internal organization that will best enable it to execute its part of the co-operative projects and, to this end, it shall designate:

- A National RCA Representative, who shall act on behalf of his/her Government on all issues relating to RCA activities;

- A National RCA Project Co-ordinator for each co-operative project in which it participates and who will act as the Member State representative in the corresponding project committee;

(f) Take measures it deems necessary to ensure the participation in the RCA co-operative projects of representatives of interested national institutions and other relevant sectors.

2.2. NATIONAL RCA REPRESENTATIVES

The National RCA Representative - appointed by the government participating in the RCA Agreement and empowered to make commitments on behalf of his/her

Government and make decisions in connection with the implementation of the Agreement - has the following duties and responsibilities:

(a) Attend all meetings of RCA Representatives, convey the views of his/her government on all issues relating to RCA activities put forward for discussion and take part in the decision-making process;

(b) Submit proposals for co-operative projects on behalf of his/her government;

(c) Notify the Agency of his/her government's decision to participate in a co-operative project;

(d) Ensure a timely submission to the Agency of his/her country's annual report and all information on activities carried out within the framework of the RCA programme. In this respect, he/she shall ensure also that the report contains reliable and verifiable data on these activities and that it includes an assessment of the impact of these activities on the country;

(e) Ensure that all measures necessary for the successful implementation of RCA activities are taken in co-ordination with National Project Co-ordinators and other relevant government or national bodies;

(f) Take appropriate steps to secure the necessary financial support for RCA activities, in consultation with the other National RCA Representatives, his/her national authorities and the Agency;

(g) Ensure the availability of the necessary resources, scientific and technical facilities and the personnel for the implementation of the co-operative projects;

(h) Ensure that only suitably qualified National Project Co-ordinators are appointed and that they are provided in a timely manner with the necessary information for their activities;

(i) Ensure that the participation of his/her country in any RCA project is in accordance with the national needs and priorities and that adequate resources are made available to the project.

2.3. NATIONAL RCA PROJECT CO-ORDINATORS

A National RCA Project Co-ordinator is appointed for each co-operative project in which the RCA Member State participates and has the following duties and responsibilities:

(a) Represent the Member State and participate in the project committee meetings, in particular project formulation meetings, project review meetings and terminal meetings;

(b) Ensure the timely nomination of national participants to the different project activities such as training courses, workshops, seminars or symposia;

(c) Co-ordinate and oversee all national activities relating to the assigned project and establish and maintain links with persons in national institutions, professional societies and interest groups concerned with the projects;

(d) Ensure the smooth and efficient implementation of all activities relating to the project within his/her country;

(e) Report to the National RCA Representative on progress, implementation and achievements of the project.

2.4. NATIONAL RCA REPRESENTATIVES MEETINGS

(a) The National RCA Representatives meet twice a year:

- As a Working Group, usually in May/June, over a period of four to five days at venues in the region, as agreed upon by the Parties;

- In Vienna at the time of the IAEA General Conference, usually in September.

(b) At the Working Group meeting, National RCA Representatives shall:

- Consider the annual report prepared by the Agency's RCA Programme Co-ordinator;

- Review the overall implementation of the RCA programme and make appropriate recommendations for improving its effectiveness and efficiency;

- Examine new project proposals, recommend a programme of activities and establish priorities;

- Examine and propose follow-up actions on conclusions and recommendations of National Project Co-ordinators Meetings (Project Committee Meetings);

- Consider policy issues, overall management and planning, including development and co-ordination of funding strategies;

- Make all necessary preparations for decisions to be taken at the General Conference Meeting.

(c) The Meeting of the National RCA Representatives in Vienna at the time of the General Conference shall:

- Approve the RCA annual report;

- Approve the programme of activities, including new project proposals recommended by the Working Group Meeting;

- Take decisions on policy issues as recommended by the Working Group Meeting;

- Consider any other matters related to or connected with the promotion and co-ordination of co-operative projects for the purposes of the RCA Agreement.

(d) Both meetings of the National RCA Representatives are chaired by the National RCA Representative of the Member State hosting the Working Group Meeting;

(e) The Agency's RCA Programme Co-ordinator is the Secretary of both meetings of National RCA Representatives. He will prepare the Agenda for the meetings and distribute it along with any relevant documentation to Member States at least one month in advance of the meeting.

3. ROLE OF THE AGENCY IN THE RCA AGREEMENT

The IAEA is not a party to the Agreement and the Director General of the Agency is the depository of the instruments of acceptance of this Agreement by Member States.

3.1. ROLE AND RESPONSIBILITIES OF THE AGENCY

The Agency has the following role and responsibilities:

(a) Perform secretariat duties under the RCA Agreement;

(b) Endeavour to support, subject to available resources, co-operative RCA projects by means of technical assistance and its other programmes. Any such assistance shall be provided, mutatis mutandis, in accordance with the principles, rules and procedures governing the provision of technical assistance by the Agency;

(c) Take initiatives to invite any Member State of the Agency other than the Participating Governments, or appropriate international organizations, to contribute financially or otherwise to, or participate in, a co-operative project. The Agency shall inform the Participating Governments of any such contributions or participation;

(d) Administer the contributions made to the RCA programme in accordance with its financial regulations and other applicable rules. The Agency shall keep separate records and accounts for each such contribution;

(e) With respect to RCA co-operative projects:

- Participate in the establishment of annual schedule of work and modalities for the implementation of the co-operative projects;

- Allocate funds for the implementation of the co-operative projects;

- Assist Participating Governments in the exchange of information and in compiling, publishing and distributing reports on the co-operative projects as appropriate;

- Consider the annual reports submitted by Participating Governments on the implementation of co-operative projects;

- Provide scientific and administrative support for the meetings of the project committees;

(f) Prepare annually an overall report on the activities carried out under the RCA Agreement, on the basis of the annual reports submitted by the Participating Governments and in consultation with them, with particular reference to the implementation of the established co-operative projects, and submit it to the Meeting of the RCA Representatives;

(g) Appoint, in accordance with its staff rules and regulations, a staff member to be the RCA Programme Co-ordinator responsible for the management and co-ordination of all RCA activities;

(h) Appoint staff members from its technical divisions as its representatives in the different project committees.

3.2. THE AGENCY'S RCA PROGRAMME CO-ORDINATOR

The Agency's RCA Programme Co-ordinator - an IAEA staff member responsible, under the supervision of the Head of East Asia and Pacific Section and the Director of the Division - has the following duties and responsibilities:

(a) Co-ordinate all activities undertaken in the framework of the RCA Agreement;

(b) Ensure the provision of assistance, upon request from Participating Governments, in the preparation of proposals for co-operative projects and in details for their implementation and review;

(c) Prepare an annual report on the activities carried out under the RCA Agreement, with particular reference to the implementation of the established co-operative projects and submit the report to the National RCA Representatives at least one month before the Working Group Meeting. The report shall have the following format:

- Part 1: A summary of the overall RCA Programme, including the financial, managerial and administrative aspects;

- Part 2: A report from each National Project Co-ordinators Meeting on the overall technical aspects and impact of the past year's work;

- Part 3: A report from each Member State on each of the projects in which they have participated, in the agreed format.

(d) Seek, in relation with other RCA Member States, Agency senior management, governments and international organizations, financial support for the agreed RCA projects as permitted by the RCA Agreement;

(e) Undertake all the necessary actions to ensure that project resources are used in an efficient and effective manner and that the programme is implemented in accordance with the Articles of the Agreement and in accordance with the IAEA's financial regulations and other appropriate rules and to report to Member States on all contributions received, financial and in-kind;

(f) Monitor the performance of all projects and promptly inform Member States of any observed problems and difficulties and initiate appropriate actions to deal with such problems and difficulties;

(g) Assist the Participating Governments in the exchange of information and in compiling, publishing and distributing reports on the co-operative projects;

(h) Ensure close co-ordination between the RCA programme and other Agency programmes, in particular the Agency's technical co-operation in the East Asia and Pacific regions;

(i) Perform the tasks of Secretary to both meetings of the National RCA Representatives.

4. DEVELOPMENT, APPROVAL, IMPLEMENTATION, REVIEW AND REPORTING OF RCA CO-OPERATIVE PROJECTS

Proposals for the establishment of a new RCA co-operative may only be made by either a single Member State or a group of Member States party to the Agreement. The Agency may assist in the preparation of a proposal at the request of a Government Party.

4.1. DEVELOPMENT AND APPROVAL OF NEW CO-OPERATIVE PROJECT PROPOSALS

(a) A new Co-operative Project Proposal must be accompanied by a project proposal document in an agreed format which should contain at least the following elements:

- Description of the regional dimension of the project in addressing significant common needs and priorities of potential participating countries;
- Justification from the scientific and technical points of view, particularly the relative merit of using nuclear technology;
- Description of attainable and measurable objectives and expected impact;
- Description of the inputs and outputs along with the different components of the project;

- Estimation of the budget;

- Estimation of the duration.

(b) All new project proposals should be submitted to National RCA Representatives at least two months prior to the Working Group Meeting to allow sufficient time for their study and evaluation by Member States in advance for their possible participation and support;

(c) The National RCA Representatives Meeting shall give its approval to all new project proposals before any further action is taken and shall specify and agree to:

- The nature and objectives of the specific co-operative project;

- The activities to be undertaken in the framework of the project;

- The means of implementing the specific co-operative project and verifying the achievement of project objectives; and

- Other relevant details as deemed appropriate.

(d) The implementation of each co-operative project proposal approved by the National RCA Representatives Meeting as described above may start only when at least three RCA Member States have notified the Agency of their intention to participate in the co-operative project.

4.2. PROJECT COMMITTEE (Project formulation, implementation and review)

(a) A Project Committee shall be established for each co-operative` project. This Committee shall consist of one representative from each Participating Government (the National RCA Project Co-ordinator) and one representative from the Agency. They may be accompanied by advisers and experts at meetings of the Project Committee.

(b) The Project Committee shall meet no later than **6 months** after the proposal has been approved by the National RCA Representatives for the formulation of the project. During the **Project Formulation Meeting** the Committee shall:

- Determine all the technical details for the implementation of the co-operative project in accordance with its objectives;

- Establish and amend, as necessary, the portion of the co-operative project to be assigned to each Participating Government, subject to the consent of that Government;

- Establish a detailed workplan for the implementation of the project;

- Determine a schedule of inputs and outputs;

- Determine the details of the budget and a timetable for expenditures;

- Make any relevant recommendations, particularly with respect to possible sources of funding and the use of regional institutions and expertise, to Participating Governments and to the Agency.

(c) The Project Formulation Meeting shall ensure that co-operative projects are presented in accordance with Standard Project Requests developed by funding institutions and executing agencies, particularly those of the IAEA, and contain all the necessary elements and justifications.

(d) After the implementation of the co-operative project has started, the Project Committee shall meet at 12 month intervals to review progress in the execution of each component of the project and recommend to the National RCA Representatives Meeting any necessary adjustments or changes in order to achieve the proposed objectives of the project.

(e) Upon completion of the project, the Project Committee shall conduct an evaluation and present a report to the National RCA Representatives Meeting.

(f) A standard format should be used for reporting the results of Project Committee Meetings (Project Formulation Meetings, Project Review Meetings, Project Evaluation Meetings). The National RCA Project Co-ordinators attending the Project Committee Meetings shall ensure that all relevant information relating to the project is available in the required format.

(g) Project Committee Meetings are chaired by the Representative of the RCA Member State hosting the meeting.

(h) The Representative of the Agency performs the tasks of Secretary to these meetings.

5. DEVELOPMENT, APPROVAL, IMPLEMENTATION, REVIEW AND REPORTING OF CO-ORDINATED RESEARCH PROJECTS (CRPs)

(a) Proposals for a new RCA Co-ordinated Research Project may only be submitted by either a single RCA Member State or a group of RCA Member States. The Agency may assist in the preparation of a CRP proposal at the request of a Government Party.

(b) Each CRP is essentially a network of national research institutes possibly encompassing all Member States in the region, but in any case not less than five RCA Member States, mandated to conduct a research programme in a well-defined topic, each being represented by a **Chief Scientific Investigator** (CSI). For CRPs, the Chief Scientific Investigator shall be the National RCA Project Co-ordinator.

(c) Within the framework of a CRP, institutes in Member States are offered three types of contractual arrangements:

- **Research Contracts**

  Research contracts are awarded for the financial support of research activities. They are awarded for one year, subject to renewal. Contract funds provided must be used to cover expenses related to the research described in the contract. Research contracts are awarded mainly to institutions in developing countries;

- **Technical Contracts**

  Technical contracts are awarded for the provision of technical services and support needed to implement research activities of a given CRP;

- **Research Agreements**

  Research Agreements, which do not provide direct financial support for research, are awarded to institutes, mainly in developed countries, which can contribute to the achievement of the objectives of a CRP. Research Agreement holders participation costs in Research Co-ordination Meetings are covered by the CRP funds.

(d) Usually, no more than one contract or agreement is awarded per Member State under a given CRP. Care must be exercised to select the best scientific institution in the Member State to participate in a CRP.

5.1. DEVELOPMENT AND APPROVAL OF NEW CRPs

(a) The procedure for development of CRP proposals and their approval are the same as those for the RCA co-operative project set forth in paragraph 4. For the CRPs supported by the Agency, its Research Contract Programme policies and procedures shall apply.

(b) CRP proposals submitted for the approval of the National RCA Representatives Meeting should meet the following criteria:

- The research should be problem-driven and contribute to the objective of the relevant RCA programme;
- The research should be oriented toward achievement of one clear and specific objective; and
- Indicators of progress of research should be definable and the anticipated result should be achievable within a 3-5 year time frame.

5.2. CRP FORMULATION AND RESEARCH CO-ORDINATION MEETINGS (RCMs)

(a) A **Project Committee** shall be established **for each CRP**. This Committee shall consist of the Chief Scientific Investigator from each Participating Government designated institutions and one representative from the Agency (Technical or Project Officer).

(b) The Project Committee shall hold a **Project Formulation Meeting** no later than 6 months after the proposal has been approved by the National RCA Representatives for the detailed formulation of the project.

(c) Each CRP should be formulated by describing comprehensively the following components:

- **Problem definition**
  A description of the problem and/or need for research;

- **Background Situation Analysis**
  An analysis of the present situation from a scientific/technical perspective, with a description of other research undertaken in this and related topics under the auspices of the Agency and by non-Agency entities;

- **Specific research objective (purpose)**
  Description of the specific objective expected to be achieved from the CRP;

- **Expected research outputs (results)**
  Description of the products expected to emerge from the CRP;

- **Action Plan (activities)**
  Give the number of contracts and agreements to be awarded, the number of RCMs anticipated, and time frames for the conduct and completion of the work;

- **Inputs**
  Financial and human resources required from the Agency and duration, including participation of the Agency's Laboratories and attendance of its staff at RCMs;

- **Assumptions**
  Any factors outside the immediate control of Participating Member States and the Agency which are needed for success;

- **Logical Framework**
  Description of the CRP (in matrix form) which shows concisely its most important features.

(d) CRPs should be fully operational within 12 months of their approval. It is essential to the RCA programme that high scientific standards are maintained with respect to each contract/agreement in the framework of a CRP. The selection of the institute should be absolutely dependent upon the ability of its staff to perform competent scientific research and the availability of adequate research facilities. Approval and renewal of contracts and agreements for a given CRP follow the Agency's established procedures.

(e) The Project Committee shall hold **Research Co-ordination Meetings** (RCMs) every 12 to 18 months to review progress, to outline investigations or to prepare a final report on the results achieved during the course of the CRP. Chief Scientific Investigators are therefore required to provide, following a standard format, a report which covers activities conducted and results achieved during the period covered by the RCM, as well as a description of future activities.

(f) Upon completion of the CRP, an evaluation of the results and achievements is made during an ultimate Research Co-ordination Meeting and the findings reported to the National RCA Representatives Meeting.

(g) Research Co-ordination Meetings are chaired by the Chief Scientific Investigator representing the RCA Member State hosting the meeting.

(h) The Representative of the Agency (Technical Project Officer) shall perform the task of Scientific Secretary to all Research Co-ordination Meetings.

6. FUNDING ARRANGEMENTS

(a) RCA Member States are expected to contribute resources to the RCA Programme to the maximum extent feasible. Their contribution may be made in cash or in kind such as providing cost-free experts for RCA projects, making equipment available, bearing the costs of subsistence of participants in events hosted by the country or any other form of contribution. A country which hosts a training event is expected to cover all local costs and provide the required logistical support required.

(b) Subject to the availability of funds, the Agency may cover the costs of attendance of representatives from the Least Developed Countries (LDCs) in National RCA Representatives Meetings. The host country of the Working Group Meeting is encouraged to bear the costs of accommodation of the National RCA Representatives, particularly those of LDCs.

(c) The costs of attendance at the meetings of the National Project Co-ordinators shall normally be covered by project funds. Funds allocated to RCA projects from the Agency's Technical Co-operation Fund shall, however, not be used to cover the costs of attendance of National Project Co-ordinators from developed countries. Costs covered by a Member State for the participation of its own representative at National Project Co-ordinators Meetings shall be shown as contributions of the Member State to the project budget.

(d) The Agency shall endeavour to support RCA projects by means of technical assistance, research contracts and other programmes and only those projects which meet its standards for quality and relevant to its programme objectives will be considered for funding. The guiding principles and general operating rules that are applicable to the Agency's technical assistance and research contracts shall apply to RCA projects funded or executed by the Agency.

(e) Efforts shall be made by both the Agency and Member States to seek extrabudgetary resources from other countries and other funding organizations. The Agency will report to the National RCA Representatives the contributions made by RCA Member States, by the Agency and by other donors.

(f) RCA Members shall consider ways and means for seeking support and resources. They may, for example, invite representatives of donor organizations to their meetings, involve representatives of donor organizations in pre-project and programming missions and provide donor organizations with detailed information about RCA Programmes.

(g) It is essential to make, at the initial stage of a project proposal, a realistic assessment of the resources likely to be made available for project implementation. A small number of solution-oriented projects in priority areas have a much greater chance of being fully funded and achieving ultimate success.

(h) It is also of critical importance to the success of the RCA programme to monitor continuously the funding priorities and adapt to new orientations adopted by the donor community and international organizations (including the IAEA) to attract funding for RCA projects. With emphasis being placed by the donor community on Sustainable Human Development (SHD), seen as central to the sustainability of development initiatives on the whole, the following gives an overview of issues which are relevant both to the donor community and to the RCA programme:

   (i) Greater emphasis is being put on the central role of participating countries in the planning and design of technical co-operation and the elaboration of their own long-term solutions to development problems;

   (ii) Increased emphasis on the improved planning in the context of co-ordinated support for sectoral objectives and policies and, in particular, use of a programme rather than an *ad hoc* project-by-project approach;

(iii) Encourage "ownership" and effective utilization of the end-users through their more active participation; this should be at both the design and implementation stage of a project;

(iv) More emphasis on the key importance for sustainable development with due attention to areas of policy analysis and development management; project objectives should be in line with national development priorities;

(v) More recognition is given to private sector needs;

(vi) Greater use of local expertise and existing infrastructure and greater attention to costs and cost-effectiveness.

NOTE

TO: Mr. P. Airey
TCAC-RCA Co-ordinator

FROM: J. Rames
ADLG

SUBJECT: Matters arising out of the 10th
RCA Working Group Meeting in Beijing, PRC

1. You have sought my views in your draft response to three questions raised at the 10th RCA Working Group Meeting in Beijing. My comments are set out below.

Question 1: What are the differences between RCA Working Group, General Conference and Project Committee meetings?

2. I suggest that the explanation of Working Group and General Conference meetings be amended and expanded to reflect the following. The RCA 1987 makes no reference to meetings of Working Groups. Given the absence of such a reference, it does not necessarily follow that a meeting of a Working Group, although a meeting of representatives in the general sense, is the "Meeting of Representatives" referred to in Article II.1 of the RCA 1987 or that the meeting of a Working Group has the powers set out in Article II.2 of the RCA 1987. In general terms, a Working Group does not normally have those powers. Indeed the fact that the question has been raised indicates a doubt in the mind of some States as to the status and capacity of the meetings of the RCA Working Groups. If an interpretation is to be made that a Working Group meeting is a meeting of Representatives as referred to in Article II.1 with the powers set out in Article II.2, that interpretation can only be made by the parties to the RCA 1987.

3. In order to remove any doubts about the matter, I suggest the matter be placed on the agenda of the forthcoming Meeting of Representatives, so that a definitive interpretation can be established and recorded in the minutes of that meeting.

4. I suggest that that part of the answer relating to Project Committees simply refer to the fact that such Committees, composed as set out in Article VI.2, are established for each project and have, in relation to each project, the functions set out in Article VI.3.

...

Question 2: What is the role of non-RCA countries in RCA projects?

5. It seems to me that a mere reference to Article VIII of the RCA 1987 is not an adequate answer to this question, particularly if, as a result of the invitation under Article VIII, a non-RCA country is to participate in, and not merely make a financial contribution to, a co-operative project. As a non-party to RCA 1987, such a country is not bound by the terms thereof, particulary Article VI. The question should be considered at the forthcoming meeting, particularly as to the conditions on which a non-RCA country is to participate in a project (including how that country's acceptance of the conditions is to be expressed and whether such a country has any role to play in the Project Committee for that project).

Question 3: How are TC projects incorporated within RCA?

6. The draft response answers the question "how are RCA projects incorporated within the TCAC Programme". I think this is appropriate provided that there are no TC projects that are not RCA projects that are incorporated within RCA. The material under paragraph 3.1 of the response should be expanded to refer to Article VII.2 of the RCA 1987 (which inevitably involves Board approval of the project).

7. The material under paragraph 3.2 of the response needs reconsideration. Having regard to the terms of Articles II, IV, V, VI and VII.1 of the RCA 1987, it is not clear to me that projects funded by donor countries (or participating Governments) are subject to the "normal Agency procedures for selection and approval". In respect of any RCA projects that are not funded (wholly or partly) by the TACF, the Agency merely performs the Secretariat functions described in Article VII of the RCA 1987, but is required to administer financial contributions in accordance with its financial regulations and other applicable rules (Article VIII.2).

JRames/em(1512)
9 September 1988
46401

cc: DIR-ADLG
Subject File - 250-B2.01
Chron.

RCA Seminar

Draft Recomendations

A. FIELD

PROGRAMME MANAGEMENT

a) Regional management:

1. The move within RCA towards regional management should be further encouraged through the strengthening of existing mechanisms. In particular, the role and responsibilities of Project Committees, should be examined to ensure that they are contributing as effectively as possible to programme planning and review.

2. The 'de facto' regional role of a number of institutes in RCA and, in particular, of the Jakarta Regional Office of the UNDP/RCA Regional Industrial Project was recognized. This is in line with a growing IAEA interest in regional programming, and of the willingness of Member States to contribute to regional development. An appropriate official recognition by the IAEA of the regional role of selected institutes was recommended. Further, the IAEA was urged to accept, to the greatest extent possible, offers by Member States of access to facilities for the benefit of the regional programme.

3. It is recognized that the concept of regional networking encouraged by UNDP is an appropriate mechanism for international co-operation, and was recommended that it be applied more extensively to the RCA programme.

b) Promotion:

4. It was recommended that Asian experts should work together to promote the applications of nuclear techniques to industry. An appropriate mechanism might be through industrial forums. The importance of balancing the promotion of isotope applications with the development of radiation protection infrastructure was recognized.

c) Co-operation with other Agencies:

5. The IAEA was encouraged to continue to explore opportunities for co-operation with other UN Agencies and Regional Associations.

B. PROJECT MANAGEMENT

a) Project selection:

6. The concentration of resources and effort on large, multi-year projects was recommended.

7. The IAEA should explore the means of ensuring that the widest cross section of views possible is canvassed in establishing RCA project priorities.

8. In assessing project priorities, particular emphasis should be placed in reducing the technological gap between the developing and the industrialized countries.

b) New projects and project extensions:

9. The IAEA was requested to develop new project proposals in the following areas:

i) Research reactor utilization, and in particular the supply and utilization of radioisotopes and services;

ii) The application of radioisotopes and radiation to industry, to agriculture and to medicine. (The IAEA should seek support through the UNDP Regional Programme for Asia and the Pacific); and

iii) Radiation protection.

Some Member States supported a new project in the field of Nuclear Power. However a consensus was not reached on the question of whether such projects sould be supported within the framework of RCA or through other avenues.

c) Project evaluation:

10. There should be a commitment to on-going project evaluation.

C. HUMAN RESOURCES DEVELOPMENT (HRD)

11. The importance of the training component in RCA projects was recognized. It was recommended that the Agency evaluate the education value of various HRD modalities (training courses, executive management seminars etc.) and explore the application of distance learning techniques.

12. The potential value of regional training centres should be recognized. It was noted that there were a number of centres associated with existing nuclear facilities which are fulfilling a 'de facto' regional role.

D. TECHNICAL CO-OPERATION AMONG DEVELOPING COUNTRIES (TCDC)

13. It was recommended that the IAEA support projects and activities leading to increased TCDC. RCA should, if appropriate, co-operate with other regions.

14. The IAEA should ensure, as far as possible, that the benefits of RCA projects flow to all RCA Member States.

15. Further efforts should be made to recruit experts from developing countries. As soon as possible, there should be an equitable allocation of expert and other assignments to all RCA countries.

16. Consistent with the RCA Agreement, there should be as broad a resource base as possible for RCA projects.

CATEGORIZATION OF THEMATIC PROJECTS IN 1997

National RCA Co-ordinator

 # Agriculture
Major Component Programme only.

[1] **RAS/0/022 "PA and Trade in Irradiated Foods"**
National Project Co-ordinator
RCA T.O.=Paisan Loaharanu(RIFA), Food Preservation, A-2266, Ext.21638

 # Industry and Environment
National Thematic Co-ordinator

[1] **RAS/0/019 " Nuclear Information System "**
National Project Co-ordinator
RCA T.O.=T. Atieh (NESI), INIS, A-2410, Ext. 22842

[2] **RAS/8/076 " Better Management of Environmental and Industrial Growth "**
National Project Co-ordinator
National Project Leader
(Not decided the whole framework of the project).

[3] **RAS/8/077**
Subproject 1 "Thematic Programme on Advanced Techniques for Industry-Applied Radiation Chemistry for Polymers "
National Project Co-ordinator
RCA T.O.= O.Guven(RIPC),Industrial Application+Chemistry, A-2364,Ext.21744
Subproject 2 " Thematic Programme on Advanced Techniques for Industry-Non -Destructive Testing and Evaluation "
National Project Co-ordinator
RCA T.O.=M. Dobrowolski(RIPC), Industrial Application +Chemistry, A-2337, Ext.26382

CRP: " Radiation Processing of Indigenous Natural Polymers "
National Project Co-ordinator
RCA T.O.= O.Guven(RIPC),Industrial Application+Chemistry, A-2364, Ext.21744

CRP: " Research and Development of RVNRL "
National Project Co-ordinator
RCA T.O.= O.Guven(RIPC),Industrial Application+Chemistry,
A-2364, Ext.21744

[4] RAS/8/078 " Nucleonic Control System and Tracers in Industry "
National Project Co-ordinator
RCA T.O.=J. Threska(RIPC), Industrial Application and Chemistry, A-2365,
Ext.21745

 # Health Care (Medical and Biological)
National Thematic Co-ordinator

[1] RAS/6/027 " Quality Assurance in Radiation Therapy "
National Project Co-ordinator
RCA T.O.=C. V. Levin(RIHU),RAD.BIOL.THER, A-2218, Ext. 21654

[2] RAS/6/028 " Thematic Programme on Health Care "
National Project Co-ordinator

Subproject-1 Nuclear Instrument maintenance
National Project Leader
RCA T.O.=Yanfan Xie(RIHU),Nuclear Medicine, A-2225, Ext.21673

Subproject-2 Enhanced Production and QC of Radioisotopes & Radiopharmaceuticals
National Project Leader
RCA T.O.=H. Vera Ruiz(RIPC), Industrial Application +Chem.
A-2369, Ext.21748

Subproject-3 Radioimmunoassay of Tumour Markers for the Detection & Management of Cancer
National Project Leader
RCA T.O.=R. Piyasena(RIHU), Nuclear Medicine, A-2232, Ext 21676

[3] RAS/6/029-a " Improved Training for Nuclear Medicine Technicians "
National Project Co-ordinator
T.O.=B. Hutton

[4] RAS/7/008 " QA in Radiation Sterilization of Tissue Grafts "
National Project Co-ordinator
RCA T.O.=J. Mircheva(RIHU),Rad. Biol. Ther. A-2219, Ext.21667

[5] RAS/6/018 " Radioimmunoassay for Hepatitis B Diagnosis "
National Project Co-ordinator
RCA T.O.= R. Piyasena(RIHU), Nuclear medicine Section, A-2232, Ext.21676

[6] CRP: E1.20.14 "Evaluation of Radioactive Iodine Therapy for Hyperthyroidism "
National Project Co-ordinator
RCA T.O.= T. Yamasaki(RIHU), Nuclear Medicine, A-22234, Ext.21678

[7] CRP: " Isotopic Evaluation in Infant Growth Monitoring "
National Project Co-ordinator
RCA T.O.= C. R. Fjeld (RIHU), Nutr. and Health Env.,A-2245, Ext.21680

[8] CRP: " Health Promotion for Adolescent Girls in Transitional Populations in East Asia and the Pacific "
National Project Co-ordinator
RCA T.O.= C. R. Fjeld

Radiation Protection
National Thematic Co-ordinator

[1] RAS/4/016 " Preparation for Disposal of LILW from Non-power Sources "
National Project Co-ordinator
RCA T.O.= K. W. Han(NEPF), Waste Technology, A-2666, Ext. 22672

[2] RAS/9/018(RAS/9/006) " Radiation Protection Infrastructures (Phase III) "
National Project Co-ordinator
RCA
T.O.=R. V.Griffith(NSRW), Radiation Safety Section, A-2740, Ext.22716
T.O.=T. Mckenna(A-2720, Ext.26067)/M.Crick(A-2736, Ext.22729)
T.O.=I. Turai(NSRW), Radiation Safety, A-2722, Ext. 22738
T.O.=P. Stegner(NSRW), Waste Safety, A-2719, Ext.22711
T.O.=G. C. Mayson(NSRW), Radiation Safety, A-2731, Ext.22719

CRP: " Reference Asian Man"
National Project Co-ordinator
RCA T.O.=R. Parr, Japanese fund expected

Energy Related and Others(Research Reactor)
National Thematic Co-ordinator

[1] RAS/0/021-a " Nuclear Power Planning "

National Project Co-ordinator
RCA T.O.= Thomas Mazour(NEPF), Nuclear Power Engineering Section, A-2540, Ext.22793

[2] **RAS/0/023 " Energy, Electricity & Nuclear Power Planning "**
National Project Co-ordinator
RCA T.O.=Pablo Molina(NEPF), Plan.+Economic Study,A-2521,Ext.22785

[3] **RAS/0/024 " Project Formulation Meetings"**
National Project Co-ordinator
RCA T.O.= K. Yanagisawa(TCPM), RCA Co-ordinator, B-1177, Ext.22313

[4] **RAS/0/025(RAS/0/015) " Development of TCDC in Asia and the Pacific (Phase II) "**
National Project Co-ordinator
RCA T.O.= K. Yanagisawa(TCPM), RCA Co-ordinator, B-1177, Ext.22313

[5] **RAS/4/011 " Research Reactor Utilization "**
National Project Co-ordinator
RCA T.O.= V. Dimic(RIPC), Physics, A-2371, Ext.21751

Annex 15a

97.06.16

S. Roa, AO x22382 B-1013
C. Maalouf, AA x22391 B-1004

[CD: Course Director]

a: Agreement
c: Invitation sent
d: Selection done
e: All done
fa: Final accounts received

TRAINING COURSES PROGRAMME WITHIN THE FRAMEWORK OF THE RCA PROJECT IN THE EAST ASIA AND PACIFIC REGION

1997

1) a, c, d, e	**19 - 26 May** 12 participants (15 February)	RW (RCA) on **NUCLEAR METHODS** in Monitoring Wear and Corrosion in Industry **LOWER HUTT**, New Zealand	**RAS-8.078-001**	J. Thereska x21745 S. Roa CD: G. Wallace
2) a, c d,e	**16 - 24 June** 15 participants (31 March)	RW (RCA) on **TRACER** Technology in Oil Field Studies for Secondary and Tertiary Recoveries **TIANJIN & BEIJING**, China	**RAS-8.078-002**	J. Thereska x21745 S. Roa CD: Liu Ming Fa
3) a, c	**21 - 25 July** 15 participants (20 May)	RTC (RCA) on Quality Control of **RVNRL** **JAKARTA,** Indonesia	**RAS-8.077-001** US$ 50,000.- Japanese funds	O. Güven x21744 S. Roa CD: M.T. Razzak
4) a,c	**18 - 26 August** 10 participants (15 June)	RW (RCA) on Production, Measurement and QA of **BRACHYTHERAPY SOURCES** **BOMBAY,** India	**RAS-6.028-004** US$ 27,338	Narashimhan x21746 S. Roa CD: Y.D. Parmar
5) a, c	**25 - 29 August** 20 participants (30 May)	RW (RCA) on Economic and Financial Aspects of **NUCLEAR POWER PROGRAMMES** **MANILA**, Philippines	**RAS-0.021-002** (Korean funds) US$ 70,000	L. Langlois x22781 S. Roa CD: G.S. Puga
6) a, c	**22 September - 3 October** 10 participants (30 June)	RW (RCA) on Production of **THERAPEUTIC RADIOPHARMACEUTICALS** **BEIJING**, China	**RAS-6.028-001** US$ 39,710.-	H. Vera Ruiz x21748 S. Roa
7) a#1,c	**29 September - 3 October** 15 participants (15 June)	RTC (RCA) on **BIODOSIMETRY** **HIROSHIMA**, Japan	**RAS-9.018-001** (Japanese funds) US$ 43,000	I. Turai x22738 S. Roa CD: Nakumara

8) a, c	**6 - 10 October** 15 participants (30 June)	RW (RCA) on **NUCLEONIC INSTRUMENTATION** **MELBOURNE** and **SYDNEY,** Australia	**RAS-8.078-003** US$	J. Thereska x21745 S. Roa
9)	**13 - 24 October**	RW (RCA) on **WASP-IV** Computer Model **TAEJON,** Rep. of Korea	**RAS-0.023-002** (C.O. US$ 96,661) US$ 152,600	B. Hamilton x22790 S. Roa
10)	**3 - 15 November**	RTC (RCA) for Delivery of Curriculum and **TISSUE BANK OPERATORS** **SINGAPORE**	**RAS-7.008-004** US$ 545,744	H. Tatsuzaki x21667 S. Roa
11) a,c	**3 - 21 November** 20 participants (15 July)	RTC (RCA) on Planning and Implementation of **NUCLEAR POWER PROJECTS** **TAEJON,** Rep. of Korea	**RAS-0.021-004** (Korea & IAEA funds) US$ 50,000	P. Trampus x22800 S. Roa CD: In-Suk Suh
12) a (#1)	**10 - 21 November**	RTC (RCA) on Recent Developments in Basic **RADIATION PROTECTION** **TOKAI,** Japan	**RAS-9.018-006** Japanese funds US$ 66,000	Webb x 22721 S. Roa CD: H. Ishiguro
13)	**1 - 12 December**	RW (RCA) on Upgrading of Analogue **GAMMA CAMERAS** with IBM PCs and Relevant Clinical Software **JAKARTA,** Indonesia	**RAS-6.028-002** (planned for 1996 under RAS-4.008-006; cancelled) US$ 60,000	Y. Xie x21673 S. Roa
14)	**December**	RW (RCA) on Fabrication and Evaluation of **NDT TEST PIECES** **BANGKOK,** Thailand	**RAS-8.077-002** (Japanese funds) US$ 180,000 (originally RAS-8.070-011; Postponed from 1996)	M. Dobrowolski x26382 S. Roa
15)		RW (RCA) on Harmonization of Regulation of **FOOD IRRADIATION**	**RAS-0.022-001**	P. Loaharanu x 21638 S. Roa
16)	(2 weeks) 20 participants	RTC (RCA) on Methodological Aspects of **TUMOUR MARKER ASSAYS** Thailand or Malaysia	**RAS-6.028-003**	Ching ? x S. Roa

Postponed to 1998

	(1 Quarter)	RTC (RCA) for Training and Development of Skills of **PUBLIC RELATIONS OFFICERS** to be informed	**RAS-7.008-001**	H. Tatsuzaki x21667 S. Roa

CM/1997-06-16

97.06.16

S. Roa, AO x22382 B-1013
C. Maalouf, AA x22391 B-1004

[CD: Course Director]

a: Agreement
b: IOM to TO
c: Invitation sent
d: Selection done
e: All done
fa: Final accounts received

REGULAR REGIONAL TRAINING COURSES PROGRAMME IN THE EAST ASIA AND PACIFIC REGION 1997

1) a,b,c d,e fa	**3 - 14 March** 16 participants (30 November 96)	RTC on Quality Control of **RADIOPHARMACEUTICA LS** **TOKYO**, Japan	**RAS-2.007** (US$94,000)	D.V.S. Narasimhan x21746 S. Roa CD: K. Shiba
2) a,b,c d,e, fa	**10 - 19 March** 20 participants (30 November 96)	RTC on **INFECTION / INFLAMMATION IMAGING** **SINGAPORE**	**RAS-6.026** (US$96,000)	G. Nair x21670 S. Roa CD: F.X.Sundram
3) a,b,c	**29 September - 18 October** 20 participants (1 August)	RTC on Management of Low and Intermediate Level **RADIOACTIVE WASTE** **BANGI (KUALA LUMPUR)**, Malaysia	**RAS-9.017** (US$127,000)	C. Chan-Sands x22607 S. Roa CD: S.A. Malek
4) a,b,c	**6 - 17 October** 20 participants (31 July)	RTC on **URANIUM RESOURCE INVENTORIES** and Ore Reserve Calculation **CHANGSHA**, China	**RAS-3.008** (US$97,000)	J.P. Nicolet x22754 S. Roa CD: Zhou Weixum Co.D: Ye Qingsen
5) a,b,c	**3 - 21 November** 12 participants (1 July)	RTC on Nuclear Analytical Techniques in **WATER QUALITY MONITORING** **CHIANG MAI**, Thailand	**RAS-8.074** (US$75,000)	M.A.R. Walsh x21750 S. Roa CD: K. Grudpan

SPECIAL FUNDED PROJECT

a b(n.a.) c,d	**23 - 28 June** 20 participants (28 April)	RW for the IAEA Member States in East Asia and Pacific Region on the IAEA Future Technical Co-operation Programme **MANILA**, Philippines	**RAS-0.026** (US$ 50,000)	M.N. Razley x22322 S. Roa CD: Ms. P.C. Roceles

97.06.16

1997-04-30

S. Roa, AO x22382 B-1013
C. Maalouf, AA x22391 B-1004

a: Agreement
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d: Selection done
e: All done
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TENTATIVE
TRAINING COURSES PROGRAMME
WITHIN THE FRAMEWORK OF THE UNDP/RCA/IAEA REGIONAL PROJECT ON BETTER MANAGEMENT OF THE ENVIRONMENT, NATURAL RESOURCES AND INDUSTRIAL GROWTH THROUGH ISOTOPE AND RADIATION TECHNOLOGY IN THE EAST ASIA AND PACIFIC REGION
RAS/8/076
1997

1)		RTC on **HYDRAULIC MODELING CODES** **SYDNEY**, Australia	**RAS-8.076-001** (Australian funds)	Y. Yurtsever x21732 S.Roa
2)	(between April - October)	RW on **HARBOUR or ESTUARY DEVELOPMENT** Australia	**RAS-8.076-002** (Australian funds)	Y. Yurtsever x21732 S. Roa
3)	**14 - 25 July**	RW on Application of Chemometrics and statistics for the Evaluation of **ENVIRONMENTAL ANALYTICAL DATA** **BANDUNG**, Indonesia	**RAS-8.076-003**	R. Parr x21657 S. Roa
4)	**23 - 27 September**	RW on **RADIATION TREATMENT** of Waste Water and Drinking Water **SHANGHAI**, China	**RAS-8.076-005** (Chinese funds) US$ 5,300 IAEA: 22,926	O. Güven x21744 S. Roa
5)	Two weeks	RW on Modeling of Ground Water Polutan Transport Malaysia	**RAS-8.076-006**	Y. Yurtsever x21732 S. Roa

Postponed to 1998

	30 June - 11 July	RW on Sustainable **NUCLEAR INFORMATION NETWORK** for RCA Countries **BANGKOK, Thailand**	**RAS-8.076-004** Postponed for early 98	T. Atieh x22842 S. Roa

CM/1997-04-30

PROJECT PROPOSAL

1. TITLE:
Application Center for Low Energy Electron Beams

2. BACKGROUND:
1) Numerous radiation scientists and engineers have been grown up in the RCA member States by the previous UNDP/RCA/IAEA Projects of Radiation Technology. It is the time to utilize these excellent man powers for R&D on new indigenous radiation processing that will contribute to the further industrial development of the region.

2) More than 100 Co-60 irradiation facilities have been installed in the region for radiation processing. However still there are several difficulties for the further development of radiation processing with Co-60 irradiation facility. Those difficulties are summarized as follows:
a) High initial investment
b) High irradiation cost
c) Management of low activity Co-60 sources

3) Electron accelerator, another type of radiation source, has fewer difficulties compared with Co-60. However high initial investment of electron accelerators would be barrier for the promotion of the radiation processing in the region unless low energy electron accelerators less than 300 kV of accelerating voltage are applied.

4) Recently new radiation processing with low energy electron beams have been developed. Typical examples are sterilization of spices and vulcanization of NR latex. Previously nobody could imagine to use low energy electron beams for these purposes. Also low energy electron beams are commonly used for crosslinking and surface modification of plastic films in many countries. It is well known that sulfur dioxide and nitrogen oxide in flue gases can be converted into fertilizer by irradiation of low energy electron beams in the presence of ammonia. Electron beam irradiation has been proposed as a new technology to remove volatile organic compounds such as toluene and xylene in the environment.

5) The low energy electron accelerator has been proved to be a versatile, practical and economic radiation source.

6) These emerging technologies with low energy electron beams surely be beneficial to all RCA member States for industrial development and conservation of the environment. Thus a Research and Development Center for the Application of Low Energy Electron Beams is proposed here.

3. OBJECTIVES:
The objectives of the Project are as follows;
a) to develop indigenous technology with low energy electron beams

d) Laboratories and building will be provided by the hosting country.
e) The activities of the Center will be managed by the hosting country
f) The hosting country has whole responsibility of the Center.

7. EQUIPMENT AND INSTRUMENT:
The following equipment and instruments should be provided by the Agency to carry out above mention activities;
a) Low energy electron accelerator (300 keV, 30 mA)
b) Liquid irradiation system
c) Powder irradiation system
d) Film irradiation system
e) Tray irradiation system
f) Gas irradiation system
g) Analytical instruments
h) Plastic testing machines

8. TIME SCHEDULE:

EQUIPMENT AND INSTRUMENT	Year					
	1st	2nd	3rd	4th	5th	6th
Low energy electron accelerator	set up					
Liquid irradiation system	set up	RWS	RTC	RTC	RTC	RTC
Powder irradiation system		set up	RWS	RTC	RTC	RTC
Film irradiation system		set up	RWS	RTC	RTC	RTC
Tray irradiation system			set up	RWS	RTC	RTC
Gas irradiation system			set up	RWS	RWS	RWS
Analytical & Testing instruments	set up	set up	set up			

b) to develop new products
c) to investigate chemical and physical aspects of low energy electron beams technology
d) to transfer the developed technology to the region
e) to train scientists and engineers in the region
f) to train staff from the member States on the regional R&D management system

4. R&D PROJECTS:

The following R&D projects will be carried out at the Center for the application of low energy electron beams. For this purpose self shielding low energy electron accelerator together with a set of irradiation systems to be installed to under beam window of the accelerator.

R&D Subject 1: Liquid irradiation technology
- Vulcanization of NR latex
- Graft polymerization of NR latex
- Modification of molecular weight of algal polysaccharide
- Decomposition of organic polychlorine chemicals (PCB)
- Emulsion polymerization

R&D Subject 2: Powder irradiation technology
- Sterilization of spices
- Sterilization of cosmetics raw materials
- Sterilization of pharmaceutical raw materials
- Sterilization of surface contamination of medical devices
- Discoloration of gem stones

R&D Subject 3: Film irradiation technology
- Production of heat shrinkable film
- Modification of fibers by graft polymerization
- Surface modification of plastic film

R&D Subject 4: Tray irradiation technology
- Production of hydrogel dressing
- Immobilization of bioactive materials

R&D Subject 5: Gas irradiation technology
- Flue gas treatment
- Removal of volatile organic compound

5. REGIONAL ACTIVITIES:

The above R&D will be carried out by the scientists and engineers from the member States. The achievement of the R&D will be transferred to the member States through the Regional Workshops (RWS) and Regional Training Courses (RTC) held at the Center.

6. MANAGEMENT:

a) IAEA Model Project type should be applied for the Center.
b) Equipment and instrument will be provided by the Agency.
c) Expenses for the maintenance will be provided by the Agency.

Directions for Concept Design

Within the past twenty years, irradiation technology and product have been applied and popularized in the fields of agriculture, material, electrical engineering, electronics, medical treatment and food industry. Combined with the other related professions, irradiation technology plays an unique role in pushing forward technology transformation of traditional industries. As a rising industry in high technology, irradiation has formed and is still forming scale economy in many countries in the world as well as in China and growing in a very high speed.

Several research establishments and manufacturers with strength in China have long engaged in irradiation research, facility design and product manufacturing, thus possessed strong technology capability and accumulated rich experiences. They are: the Institute of Shanghai Nuclear Research, the Institute of Beijing High-energy Physics and the Institute of Lanzhou Recent Physics under the Chinese Academy of Science, Nanjing University, Beijing Haite engineering Plastics Ltd Co. and Jiangsu Changshu Cable Plant (Changshu Irradiation Centre). In the past many years, they have made ramarkable contributions to China's irradiation industrialization by providing for many factories in China with many types of irradiation facilities. irradiation products and new technology of production, making them to gain significant economic benefits in a short period of time. Now, they hope that these ripe and effective technology, facility and product can be spread abroad, highly expecting to provide effective service to the developing countries in their economic development and technology enhancement.

Therefore the Institute of Shanghai Nuclear Research, the Institute of Beijing High-energy Physics and the Institute of Lanzhou Recent Physics of the Chinese Academy of science, Nanjing University, Beijing Haite Engineering Plastics Ltd Co. , Jiangsu Changshu Cable Plant (Changshu Irradiation Centre) and the Institute of Beijing Sanqiang Nuclear Research, in the direction of the Irradiation Specialized Committee of the Chinese Association for Isotope and Irradiadion, with the advantages of the alliance of technology, design, manufacturing and production of accelerators, have formed a federation of research and production ---- Beijing Irradiation Joint Development Centre. It outlines " Concept Design of the Irradiation Accelerator Facility Systems " . The characteristics of concept design are as follows :

1. According to different usage, it is to provide with stable, reliable and advanced accelerator facility system, in line with the energy range of the current irradiation accelerator (high voltage accelerator 0.5-1.5MeV, 1-3 MeV, and microwave linear accelerator 6-12MeV).

2. The capability of technology accessories is strong, that is to say, it is not only to supply with the complete set of irradiation facilities, but also with production technology, production art and the corresponding technology facilities according to users needs and market requirements.Therefore,the economic benefit can be quickly achieved as the system is put into operation.

3. It is to provide with the perfect technical service, This includes site selection, design, system assembling, test, technology and facility accessories, technology training and post services etc.

4. The federation holds the principle of users first and credit first. Based on the contents of the concept design, we are able to take project contract, provision of specialized facilities, product development and information consultations. We are striving for a new level for irradiation industry in pace, in the complete set of technology production and in post services of the accelerator in order to make our contributions to the international market.

Concept Design of the Electron Accelerator Facility Systems Used for Irradiation Processing

Ⅰ. The basis of design

Ⅰ.1 Investigation report on the applications of irradiation processing technology and industrilization

Ⅰ.2 "General code of electron accelerator used for radiation processing"

Ⅰ.3 "5172 radiation protection rule of particle accelerator"

Ⅱ. Applications

Ⅱ.1 Production of radiation crosslinked wire and cable

Ⅱ.2 Production of heat-shrinkable material and high polymer materials

Ⅱ.3 Curing of coatings for wood etc and modification of materials

Ⅱ.4 Modification of semiconductor devices and inorganic crystal materials

Ⅱ.5 Desulfurization and denitration (SO_X NO_X) of stack gas

Ⅱ.6 Irradiation vulcanization of rubber

Ⅱ.7 Insecticide sterilization preservation and quarantine treatment of food

Ⅱ.8 Sterilization of medical product and other commercial product

Ⅱ.9 Other applications of radiation

Ⅲ. Introduction of representative products and their special assorted materials of radiation processing

Ⅲ.1 Radiation crosslinked wire and cable products and their insulation materials

Ⅲ.1.1 Radiation crosslinked wire and cable

Ⅲ.1.1.1 Radiation crosslinked polyolefine insulated power cable rated votage 10KV and lower

Ⅲ.1.1.2 Radiation crosslinked weather resistant polyolefine insulated overhead cable rated voltage 10KV and lower

Ⅲ.1.1.3 Radiation crosslinked flame retardant cable

Ⅲ.1.1.3.1 Radiation crosslinked polyolefine insulated fiame retardant wire and cable

Ⅲ.1.1.3.2 Rated voltage 1KV radiation crosslinked polythylene insulated flame retardant power cable

Ⅲ.1.1.3.3 Radiation crosslinked flame retardant control cable

Ⅲ.1.1.3.4 Radiation crosslinked flame retardant communication cable

Ⅲ.1.1.4 Radiation crosslinked special wire and cable

Ⅲ.1.1.4.1 Radiation crosslinked submersible oilpump power cable rated vollage 6KV and lower

Ⅲ.1.1.4.2 Radiation crosslinked navaid lighting cable for airport rated voltage 6KV and lower

Ⅲ.1.1.4.3 Radiation crosslinked wire and cable for locomotive and railway carriage rated voltage 3KV and lower

Ⅲ.1.1.4.4 Radiation crosslinked polyolefine insulated wire and cable for the lead wire of electric machine

Ⅲ.1.1.4.5 Radiation crosslinked wire and cable for aviation use

Ⅲ.1.1.4.6 Radiation crosslinked wire and cable for mine use

Ⅲ.1.1.4.7 Temperature self-limit thermo-accompaniment cable

Ⅲ.1.1.4.8 Radiation crosslinked wire for high voltage lead wire of colour TV

Ⅲ.1.1.4.9 Radiation crosslinked wire for automobile

Ⅲ..1.1.4.10 Radiation crosslinked radiation-resistant wire and cable for nuclear power station

Ⅲ.1.2 Special assorted materials for the radiation crosslinked wire and cable

Ⅲ.1.2.1 Insulation material used for radiation crosslinked wire and cable

Ⅲ.1.2.1.1 Polyolefine insulation material used for radiation crosslinked power cable rated voltage 10KV and lower

Ⅲ. 1.2.1.2 Weather-resistant polyolefine insulation material used for radiation crosslinked overhead cable rated voltage 10KV and lower

Ⅲ.1.2.1.3 Polyolefine insulation material used for radiation crosslinked navaid lighting cable in airport

Ⅲ.1.2.1.4 Insulation material used for radiation crosslinked cable of the motor of submersible oilpump

Ⅲ.1.2.1.5 Insulation material used for radiation crosslinked cable of dust remover

Ⅲ.1.2.1.6 Insulation material used for radiation crosslinked high voltage lead wire of colour TV

Ⅲ.1.2.2 Sheath material used for radiation crosslinked wire and cable

Ⅲ.1.2.2.1 Low-smoke low-halogen flame retardant radiation crosslinked sheath material

Ⅲ.1.2.2.2 Low-smoke halogenless flame retardant radiation crosslinking sheath material

Ⅲ.1.2.2.3 Oil resistant flame retardant radiation crosslinking sheath material

Ⅲ.1.2.2.4 Weather resistant flame retardant radiation crosslinking sheath material

Ⅲ.1.2.3 Semiconducting screen material of radiation crosslinked cable

Ⅲ.1.2.3.1 Semiconducting inner screen material of radiation crosslinked cable

Ⅲ.1.2.3.2 Semiconducting outer screen material of radiation crosslinked cable

Ⅲ.1.2.4 Special material of radiation crosslinked spacial wire and cable

Ⅲ.1.2.4.1 Special material for the wire and cable used in locomotive and railway carriage

Ⅲ.1.2.4.2 Inner sheath special material for the cable of submersible oilpump

Ⅲ.1.2.4.3 Special material for the lead wire and lead cable of electric machine

Ⅲ.1.2.4.4 Special material for the high-efficiency wire of automobile

Ⅲ.1.2.4.5 Special material for the wire and cable of nuclear power station

Ⅲ.1.2.4.6 Special material for cable in mine usege

Ⅲ.2 Heat-shrinkable material and its products special assorted material

Ⅲ.2.1 Heat-shrinkable material and its new construction, new ingredient used for power cable

Ⅲ.2.2 Heat-shrinkable products and its special adhesive used for communication cable

Ⅲ.2.3 Heat-shrinkable material used for electronic system

Ⅲ.2.4 Heat-shrinkable material used for oil tube protection system

Ⅲ.2.5 Compound heat-shrinkable material, compound belt, double wall tube etc

Ⅲ.2.6 Special adhesive of heat-shrinkable products

Ⅲ.3 Radiation modification of wood and materials

Ⅲ.3.1 Material for interior decoration (wooden floor board, plaster tablet)

Ⅲ.3.2 Products of pseudo padauk (handicraft article)

Ⅲ.4 Modification treatment of semicoductor devices

Ⅲ.4.1 Quick resume of large, middle and small power tube, rise high frequency, increase the switching speed of rectifying diode damping

Ⅲ.4.2 Manufacture of high speed thyristor, adjustment of property

Ⅲ.4.3 Increase grade level of switching time for high speed diode, transistor, and thyristor

Ⅲ.4.4 Adjustment of parameter for bipolar transistor

Ⅲ.5 Desulfurization and denitration (SO_x NO_x) of stack gas

EB method is a dry treatment process, no secondary contamination, no need of post treatment for contaminated water. The efficiency of desulfurization (SO_x) can come up to more than 95%. meantime more than 80% of NO_x can be removed. The by-product is ammonium sulfate-nitrate compound salt, it can be used directly as the compound fertilizer for agricullure or as the raw material for chemical industry.

Ⅲ.6 Insecticide, sterilization, preservation and quarantine treatment by irradiation for food

Ⅲ.6.1 Quarantine treatment by irradiation for wheat dwarfint bunt

Ⅲ.6.2 Quarantine treatment by irradiation for salmonello pollution of fish power

Ⅲ.6.3 Quarantine treatment by irradiation for fruit and fresh flower

Ⅲ.6.4 Sterilization and wipe out parasite treatment by irradiation for freezing food (chicken, duck, shrimp meat etc)

Ⅲ.6.5 Decrement of the pollotion of flavacd by irradiation treatment for oil crops (peanut, soybean)

Ⅲ.6.6 Preservation treatment by irradiation for garlic

Ⅲ.6.7 Sterilization treatment by irradiation for cigarette and tobacco

Ⅲ.6.8 Ageing treatment by irradiation for alcohol

Ⅲ.6.9 Fresh preservation treatment by irradiation for the free-washing rice

Ⅲ.7 Other applications of radiation

Ⅲ.7.1 Radiation crosslinked polyethylene expanded plastic

Ⅲ.7.2 Production of polytetrafluoroethylene superfines by radiation degradation

Ⅲ.7.3 Radiation colouring of quartz glasses and material

Ⅳ. Performance indexes construction characteristics, composition and application scopes of irradiation accelerator.

According to the requirement of users, the irradiation accelerator with different performance indexes and the assorted irradiation processing systems can be provided.

In this concept design, the representative specification of high voltage transformer type irradiation accelerator is 0.5-1.5 MeV, 40mA. The representative specification of high frequency high voltage type irradiation accelerator is 1.0-3.0 MeV, 30mA. The representative specification of linear type irradiation acceleration is 6.0-12 MeV, 4.2KW.

The two sorts of high voltage type irradiator accelerator with energy range of 0.5-3.0 MeV, according to the reguirement of market, a series of products with the maximum energy of 3.0 MeV, 2.5MeV, 2MeV and 1.5 MeV etc can be provided.

Ⅳ.1 0.5-1.5 MeV irradiation accelerator system

Ⅳ.1.1 Main performance indexes

Ⅳ.1.1.1 Electron energy 0.5-1.5 MeV continuous regulation

Ⅳ.1.1.2 Beam intensity 0-40mA continuous regulation

Ⅳ.1.1.3 Beam power 60 KW

Ⅳ.1.1.4 Fluctuation of energy less than ± 5%

Ⅳ.1.1.5 Fluctuation of beam less than ± 2%

Ⅳ.1.1.6 Scanning from X, Y two directions

Ⅳ.1.1.7 Scanning width X 1000mm, Y 75mm

Ⅳ.1.1.8 Scanning frequency X 50Hz, 100Hz. Y 1000Hz

Ⅳ.1.1.9 Scanning unevenness ± 10 %

Ⅳ.1.1.10 Input power 80 KVA

Ⅳ.1.1.11 Static vacuum 10^{-5} Pa

Ⅳ.1.1.12 Working vacuum 10^{-4} Pa

Ⅳ.1.1.13 Insulation gas and pressure SF_6, 6.5Kg/cm^2

Ⅳ.1.2 Accelerator compositions

Ⅳ.1.2.1 Main body of accelerator (including the main tank and the titanium window system for bring out of beam)

Ⅳ.1.2.2 Power distribution system

Ⅳ.1.2.3 Intermediate frequency power supply system (intermediate frequency generator)

Ⅳ.1.2.4 Computer control system

Ⅳ.1.2.5 Tap water cooling system

Ⅳ.1.2.6 Blower cooling system

Ⅳ.1.2.7 Vacuum system

Ⅳ.1.2.8 SF_6 gas system

Ⅳ.1.2.9 Safeguard linkage system

Ⅳ.1.2.10 Electric beam stop target system

Ⅳ.1.3 Construction characteristics and applications

Ⅳ.1.3.1 Compact construction, small outline size, small area required, and economic in building investment.

Main body outline size of the accelerator: φ 1350 × 2750

Ⅳ.1.3.2 High transition efficiency of electric power (~75%), a small amount of assistant equipment, simple to operate, easy to maintain, high capability for continuously production, low cost for operation.

Ⅳ.1.3.3 Suitable for producing of heat shrinkable material and products, middle and small special radiation crosslinked wires.

Ⅳ.1.3.4 The transfer system described in section V can be matched with this accelerator to form irradiation production line.

Ⅳ.2 1.0 MeV-3.0 MeV irradiation accelerator system

Ⅳ.2.1 Main performance indexes

Ⅳ.2.1.1 Electron energy 1-3.0 MeV continuous regulation

Ⅳ.2.1.2 Beam intensity 0-30 mA continuous regulation

Ⅳ.2.1.3 Beam power 90 KW

Ⅳ.2.1.4 Fluctuation of energy less than ± 2%

Ⅳ.2.1.5 Fluctuation of beam less than ± 2% (Maximum beam)

Ⅳ.2.1.6 Scanning form X direction

Ⅳ.2.1.7 Scanning width 900-1200 mm

Ⅳ.2.1.8 Scanning frequency 50 Hz 100 Hz 200Hz

Ⅳ.2.1.9 Scanning unevenness ± 10%

Ⅳ.2.1.10 Input power 250 KVA

Ⅳ.2.1.11 Vacuun 10^{-5} pa

Ⅳ.2.1.12 Insulation gas and pressure SF_6 6.5 Kg/cm^2

Ⅳ.2.2 Accelerator compositions

Ⅳ.2.2.1 Main body of accelerator (including the main tank, titanium window and beam bring out system)

Ⅳ.2.2.2 Power distribution system

Ⅳ.2.2.3 High frequency generator power supply system, high frequency generator, high frequency rectificating system, electron gun, accelerating tube, scanning system

Ⅳ.2.2.4 Conputer control system

Ⅳ.2.2.5 Water cooling system

Ⅳ.2.2.6 Blower cooling system

Ⅳ.2.2.7 Vacuum system

Ⅳ.2.2.8 SF_6 gas treatment system

Ⅳ.2.2.9 Safeguard linkage system

Ⅳ.2.2.10 Pneumatic beam stop target system

Ⅳ.2.3 Construction characteristics and applications

Ⅳ.2.3.1 The inner construction of accelerator is simple, electric change stored energy is small and the equipment will not be easily damaged during sparking in the tank. Therefore the operation is reliable, the cycle of continuous producing is long and the maintenance is easy.

Ⅳ.2.3.2 High beam energy, high power, a great variety products can be irradiated, high output, quick return for the investment, the producing breed can be changed whenever according to the requirement of market, the competitive power of enterprise will be raised.

Ⅳ.2.3.3 Suitable for producing of large, middle and small radiation crosslinked wire and cable, heat shrinkable accessory and engineering plastic etc.

Ⅳ.2.3.4 The transfer system described in section V can be matched with this accelerator to form irradiation production line.

Ⅳ.3 6MeV-12MeV electron linear irradiation accelerator system

Ⅳ.3.1 Main performance indexes

Ⅳ.3.1.1 Electron energy 6-12 MeV sectional regulation

Ⅳ.3.1.2 Beam intensity (average) 0-700 μ A

Ⅳ.3.1.3 Beam power 4.2KW

Ⅳ.3.1.4 Fluctuation of energy less than $\pm$ 5%

Ⅳ.3.1.5 Fluctuation of beam less than $\pm$ 2%

Ⅳ.3.1.6 Max.power of X ray 1KW

Ⅳ.3.1.7 Dose rate of X ray

0.8-1.2 (KGy / hr) (transfer speed of product 10 m/hr)
0.04-0.06(KGy/hr) (transfer speed of product 200m/hr)

Ⅳ.3.1.8 Scanning unevenness $\leqslant \pm$ 5%

Ⅳ.3.1.9 Scanning width 1000mm

Ⅳ.3.1.10 Scanning frequency synchronizing scanning

Ⅳ.3.1.11 Input power 75KW

Ⅳ.3.1.12 Static vacuum $\sim 10^{-6}$ pa

Ⅳ.3.1.13 Working vacuum $\sim 10^{-5}$ pa

Ⅳ.3.1.14 Insulation gas and pressure N_2 2Kg/cm^2

Ⅳ.3.2 Accelerator compositions

Ⅳ.3.2.1 main body of accelerator and large power radio frequency system (including electron gun and power supply, RF accelerating tuble , full solid radio frequency power supply and large power S band klystron)

Ⅳ.3.2.2 Focusing and guiding system and their power supply

Ⅳ.3.2.3 Beam scanning system and power supply

Ⅳ.3.2.4 Vacuum and gas filling system

Ⅳ.3.2.5 Constant temperature water cooling system

Ⅳ.3.2.6 Monitoring system of beam and dose

Ⅳ.3.2.7 Target switching device of X ray

Ⅳ.3.2.8 Control system for accelerator program and performance

Ⅳ.3.2.9 Safeguard linkage system

Ⅳ.3.3 construction characteristics and applications

Ⅳ.3.3.1 Microwave electron linear accelerator is one of the advanced new irradiation processing facilities of our time. The characteristics of this facility are: high energy, wide energy range, flexible irradiation processing, compact comstruction, small area required, economic investment, low operation cost, high benefit and short term for the investment returnning.

Ⅳ.3.3.2 By means of switching target the electron beam can be converted into X ray with more high performances than the Co^{60} γ ray such as in penetration, field distribution, availability of the ray. but the costs of construction and operation of this accelerator will be lower then the Co^{60} souce.

Ⅳ.3.3.3 This linear accelerator not only suitable for the irradiation of large quantities specific product in specialized factory but also for the construction of an irradiation center for comprehensive products processing.

Ⅳ.3.3.4 Irradiating sterilization (medical device medicines cosmetics and others)

Ⅳ.3.3.5 Irradiating fresh preservation (small packing freezing meat, agricultural products, non-staple food)

Ⅳ.3.3.6 Radiation modification of semiconductor devices

Ⅳ.3.3.7 Irradiation crosslinked of small wire and cable

Ⅳ.3.3.8 Irradiation crosslinked of various heat shrinkable materials

Ⅳ.3.3.9 Irradiation corsslinked of polyethylene expanded plastic

Ⅳ.3.3.10 Irradiation degradation of polytatrafluoroethylene

Ⅳ.3.3.11 Irradiation of ageing alcohol

Ⅳ.3.3.12 Irradiation colouring of quartz material and products

Ⅳ.3.4 Assorted irradiating transfer arrangement

Ⅳ.3.4.1 Platform type irradiating arrangement for semiconductor devices, heat shrinkable material and inorganic crystal material etc

Ⅳ.3.4.2 Roll type irradiating arrangement for wire and cable

Ⅳ.3.4.3 Conveyer belt type irradiating arrangement used for disinfection, sterilization and preservation etc for various articles

Ⅴ. Computer controling transfer system for producing of radiation crosslinked wire and cable

Ⅴ.1 Transfer system, mainly for middle and small wire and cable, with considerations of the large cable with outer diameter of insulation more than φ 20 mm.

Ⅴ.1.1 Main performance indexes

Ⅴ.1.1.1 Highest wire velocity 400 m/ min

Ⅴ.1.1.2 Irradiation unevenness $\leqslant \pm$ 15%

Ⅴ.1.1.3 Irradiation types

smal wire: outer diameter of insulation φ 1-φ 12, deformed $\propto$ type, irradiation at two planes.

middle wire: outer diameter of insulation φ 12-φ 20. track type, irradiation from two directions.

large cable: outer diameter of insulation 20 mm $< \varphi <$ 60mm circumferential irradiation

Ⅴ.1.2 Composition of the transfer system

Ⅴ.1.2.1 Wire gathering and releasing equipment

Ⅴ.1.2.1.1 Small wire gathering and arranging equipment (PN500-PN800) one set. Double trays type wire gathering and arranging equipment, replace tray manually, AC frequency- changing motor 15 KW

Ⅴ.1.2.1.2 Small wire releasing equipment (PN500-PN800) two sets. Replace tray manually, AC frequency-changing motor 15KW

Ⅴ.1.2.1.3 Large and middle cable gathering and releasing equipment (PN1000-PN2240) one set. AC frequency-changing motor 7.5 KW

Ⅴ.1.2.1.4 Large and middle cable releasing equipment (PN1000-PN2240) one set. AC frequency-changing motor 7.5 KW

Ⅴ.1.2.2 800KG chain-track type dragger, one set, AC frequency-changing motor 7.5 KW

Ⅴ.1.2.3 Wire storing type small wire tension controller, wheel diameter φ 150mm, tension regulated by cylinder

Ⅴ.1.2.4 Wire storing type middle wire tension controller, wheel diameter φ 400mm, tension regulated by cylinder

Ⅴ.1.2.5 Weight balanced lever type large cable tension controller

Ⅴ.1.2.6 Transfer equipment under the electron beam

Ⅴ.1.2.6.1 Including two outer side driving rolls φ 600 × 750, two inner side driving rolls φ 400 × 750, decelerator, motor etc, movable carriage, track and positioning holder. The outer side rolls can be designed with diameter of φ 800-1200 to meet the needs of large and middle cables

Ⅴ.1.2.6.2 Stainless steel protective mask for filling with fresh air to prevent ozone

Ⅴ.1.2.6.3 Guide-comb

Ⅴ.1.2.6.4 Sector compression rod

Ⅴ.1.2.6.5 Mould for diameter fixing

Ⅴ.1.2.6.6 φ 1250 reversing guide-wheel for large diameter cable

Ⅴ.1.2.6.7 Guide-wheel sets for cable in and out the irradiating room

Ⅴ.1.2.6.8 Intermediate guide-wheels and guide-rods

Ⅴ.1.2.6.9 Lifting-rod compression-rod and guide-rod sets

Ⅴ.1.2.7 Irradiating magnet

Ⅴ.1.2.7.1 Reflection magnet

Ⅴ.1.2.7.2 Two-direction magnet

V.1.2.7.3 Circumferential magnet

V.1.2.7.4 Magnet power supply

V.1.2.8 computer control system

V.1.2.8.1 Industrial control 486 computer, printer, scope, ups power supply

V.1.2.8.2 A/D, D/A, I/O, INT interface plate

V.1.2.8.3 Local slow motion control station for wire threading and arranging

V.1.2.8.4 Control cabinet of frequency-change adjustable-speed motor

V.1.3 Application scopes

V.1.3.1 The cost of this system is low and its efficiency is high. This system will be satisfactory to the user for producing radiation crosslinked middle and small wire

V.1.3.2 The construction of this system is movable, it will be satisfied for composite use with the irradiating carriage on ground in the irradiating room

V.1.3.3 Computer is used in this system for controlling, monitoring and diagnosing. The wire velocity will track the intensing of beam, therefore the irradiation evenness can be guaranteed.

V.2 Two sets deformed ∝ type transfer system for large, middle and small radiation crosslinked wire and cable

V.2.1 Main performance indexes

V.2.1.1 Wire velocity: small wire 30-300 m/min, middle wire 20-150 m/min, large cable 10-100 m/min

V.2.1.2 Irradiation unevenness $\leqslant \pm$ 15%

V.2.1.3 Irradiation type

Small wire, outer diameter φ 1-φ 6, deformed ∝ type, irradiating at two planes.

Middle wire, outer diameter φ 6-φ 20, deformed ∝ type, irradiating at two planes.

Large wire, outer diameter φ 20-φ 35, track type irradiating at two planes.

V.2.2 Composition of the transfer system

V.2.2.1 Wire gathering and releasing equipment

V.2.2.1.1 Small wire double trays gathering and arranging equipment (PN400-PN630) one set, non-stop for tray replacing, AC frequency-changing adjustable speed motor, power 3KW

Ⅴ.2.2.1.2 Small wire active releasing equipment (PN100-PN630) two sets, AC frequency-changing adjustable-speed meter power 3 KW

Ⅴ.2.2.1.3 One set of small wire storing equipment at the wire releasing end, it makes the equipment under the electron beam running continuously and without stopping the beam

Ⅴ.2.2.1.4 Gantry travel type wire gathering and arranging equipment (pn800-pn2000) one set, AC frequency-changing adjustable-speed motor, power 4 KW

Ⅴ.2.2.1.5 Gantry travel type large and middle wire active releasing equipment (PN800-PN2000) one set, AC frequency-changing adjustable-speed motor, power 4 KW

Ⅴ.2.2.2 4000N chain-track type assistant dragger one set, AC moment motor, 4000 N.m

Ⅴ.2.2.3 Wheel diameter φ 200mm, wire storing type small wire tension controller, tension regulated by cylinder

Ⅴ.2.2.4 Weel diameter φ 500mm, wire storing type middle wire tension controller, tension regulated by cylinder

Ⅴ.2.2.5 Weight balanced lever type large cable tension controller, tension regulated by cylinder

Ⅴ.2.2.6 Movable on track, six rolls transfer equipment under the electron beam

Ⅴ.2.2.6.1 φ 1200 × 900 two outer side driving rolls φ 450 × 900 clutch type four inner side driving rolls, deccelerators and motors ets

Ⅴ.2.2.6.2 Stainless steel protective mask for filling with fresh air to prevent ozone

Ⅴ.2.2.6.3 Carding and guide-wheel equipment

Ⅴ.2.2.6.4 Guide-comb

Ⅴ.2.2.6.5 Guide-wheel sets for cable in and out the irradiation room

Ⅴ.2.2.6.6 Intermediate guide-wheel and guide-rods

Ⅴ.2.2.6.7 Water cooled electron reflection target system

Ⅴ.2.2.6.8 Computer control system

Ⅵ. Carriage transfer system for producing heat shrinkable material

Ⅵ.1 Stepless speed change is used for running of transfer carriage. and the speed can be determind according to the requirement such as 0.5-8 m/min

Ⅵ.2 Driven by chain wheel and roller chains, equipped with tensile device

Ⅵ.3 Power supply and rotating device on the transfer carriage

Ⅵ.4 Control system, including the display and control of carriage position. sequence and counting in the irradiating room

Ⅶ. Figures of accelerator and irradiation room of the radiation crosslinked cable and wire production line

Fig.1, Elevation of the 0.5-1.5MeV high voltage transfomer type accelerator

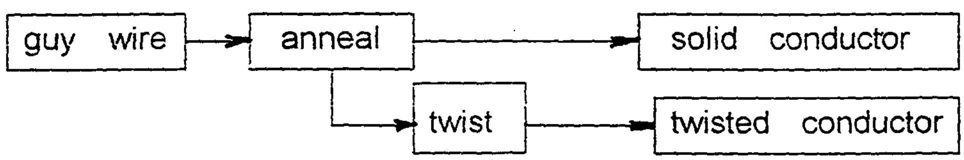
Fig.2, Plan of the irradiation room of 0.5-1.5MeV accelerator

Fig.3, Elevation of the 1-3MeV high frequency high voltage type accelerator

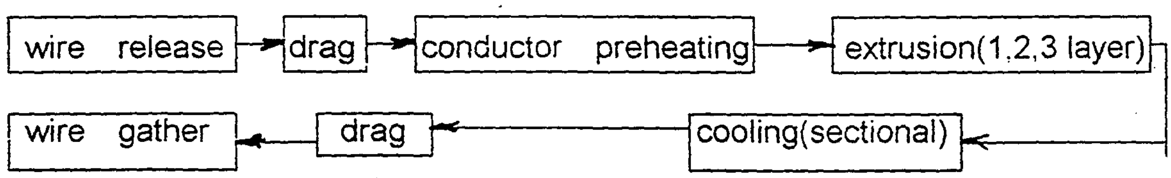
Fig.4, plan of the irradiation room of 1-3MeV accelerator

Ⅷ. Technological process of radiation crosslinked wire and cable

Ⅷ.1 Conductor manufacture

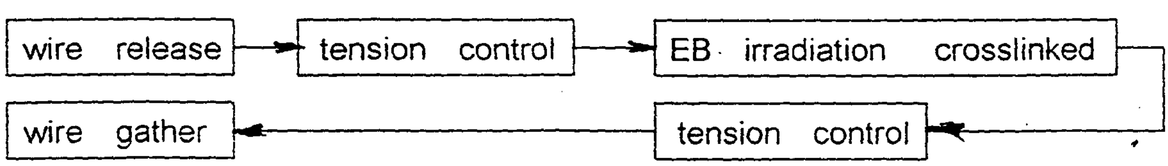


Ⅷ.2 plastic extrusion

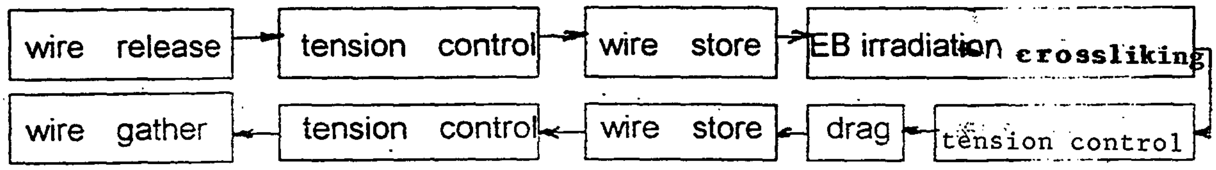


Ⅷ.3 Radiation crosslinking

Ⅷ.3.1 Small wire

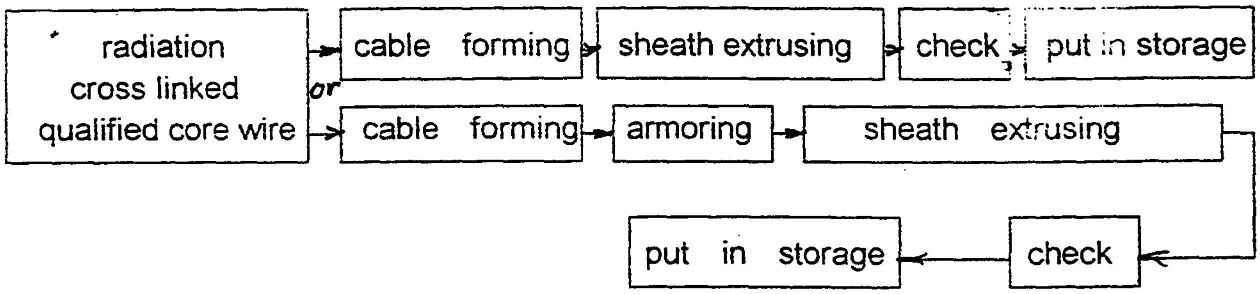


Ⅷ.3.2 Middle and large cable

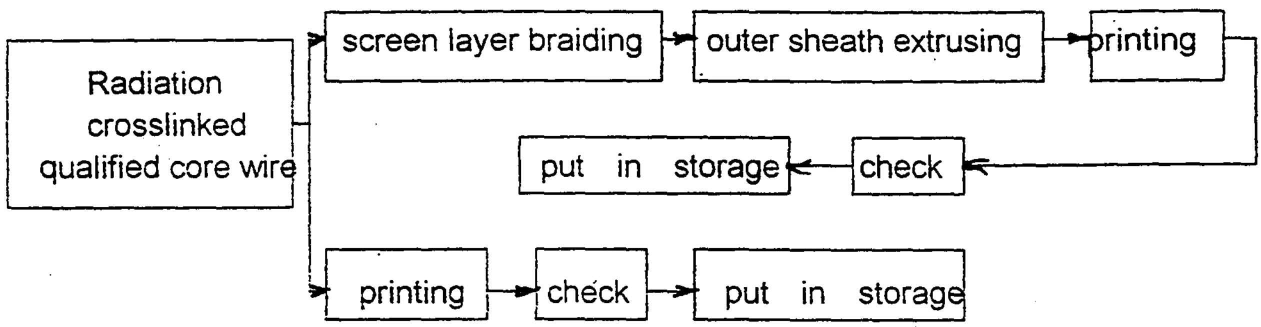


Ⅷ.4 Procedure of cable (wire) forming

Ⅷ.4.1 Cable



Ⅷ.4.2 Wire



Ⅸ. Quality guarantee setups of the irradiation accelerator facility system

Quality is the life of product. The EB irradiation production line is based on the strongpoints of the products manufactured by our relative collaborators, the developing tendency in the world and the requirements of the users both from home and abroad as well as the advantages of other production lines. Therefore our product has the price preference and competitive power in the national and international markets.

The overall construction and performance index of the recommended standard production lines are examined and appraised by the specialist group of the federation.

quality control of material selection and pacts manufacturing will be executed according to the related national codes. It will be accomplished by the undertaking collaborators.

When a complete set or a subsystem is assembled, performance tests have to be taken, testing records have to be completed, and all designed indexes must be reached. Testing will be carried out by the undertaking collaborators and the spcialist group of federation will check and test again if necessary.

When the facilities are manufactured by several collaborators, the mutual relations and interface arrangements among them will be assigned clearly in the overall design and then accomplished by the relative collaborators through coordination.

During the production line is being installed in the users field, the federation will appoint specialists to coordinate the total engineering: checking to make sure that all technological conditions provided by user must correspond to the requirements; time distribution for collaborators to install and test the equipments; conducting the overall test after all equipments have been tested and qualified; and then turning it over to user for acceptance after all performance indexes are satisfied.

As an industrial production equipment, the production line should be able to operate durably, stably and reliably in the rated load. Our production line can reach this objective as this is the result of strictly implementing quality control code in the whole process of manufacture.

X. Technical service items

X.1 Guaranteed service items

X.1.1 installation and test of the equipments of radiation crosslinking production line or provision technical direction needed in the process of installation and test.

X.1.2 Provision of technical drawings and documents of production line for installation and maintenance.

X.1.3 Training of operators and maintainers for the radiation crosslinking production line.

X.1.4 Provision of technological documents needed in the design of cooling water, ventilation, power, air conditioning and building, including the computation of radiation protection.

X.1.5 Free maintenence for one year after the production line has been accepted. For long term user, a special contract will be signed.

X.2 Extra service items

X.2.1 Compile project report of radiation crosslinking production line and the engineering feasibility report.

X.2.2 Compile report of environment review.

X.2.3 Overall engineering design

Building: Architecture and structure design of the **accelerator** hall, irrdiation hall, control room, cable transfer workshop, **assistant** system room and other assistant rooms etc. It will be including water supply, drainage, illumination, air conditioning and **power** supply for these rooms.

Assistant system: Cooling water system, ventilation **system** power supply system, and radiation protection structure etc

XI. Investment analysis

It can be worked out according to the requirement of users.

1. Dynamitron Accelerator, 3000kv/30mA/1000mm
900,000 (USD)

2. High Voltage Transformer Accelerator,
1500kv/40mA/1000mm
550,000(USD)

3. 6MeV-12MeV Electron Linear Accelerator
12,000Kv/700uA/1000mm
550,000 (USD)

4. Handling System for Wire and Cable Radiation Crosslinking Depend on Different Consisting from 250,000 to 500,000 (USD)

Speech by DR TIN HLAING
RCA National Coordinator (Myanmar)
at the Silver Jubilee Celebration of RCA, Yangon, March 10,1997

Excellencies, Distinguished Representatives of the IAEA, RCA National Coordinators and Delegates, ladies and gentlemen.

Today is a really great day for Myanmar. We are gathered here to celebrate the Silver Jubilee of RCA. This is the first of all RCA Silver Jubilee Celebrations to take place in all 17 Member States.

The RCA is an agreement in which seventeen Member States have agreed to cooperate in Development, Research and Training Related to Nuclear Science and Technology. As I understand it, the International Atomic Energy Agency has been the main initiator and supporter of RCA. The interaction among the RCA members occurs through the medium of IAEA.

The agreement began in 1972. So this year it is 25 years old and is now celebrating the 25th anniversary of Silver Jubilee.

On this occasion, I have short remarks about the RCA. It is remarkable in two respects.

Firstly, the RCA represents a very large geographical area and also a huge population. It includes Pakistan and India in the west to Japan and New Zealand in the east. Population-wise it represents more than 2 billion people.

Secondly, it carries the trade-mark “agreement”. Yes, the word is in the name. Accordingly, the RCA functions by agreement among its members. All countries agree - there is no disagreement about anything that is carried out as an RCA effort.

This is a good example.

This morning, our Minister of Science and Technology used the word “Unity-in-diversity”. I think this is appropriate and noteworthy.

So the RCA has come of age. I believe it will continue to serve the region of Asia and Pacific. I wish RCA great success.

Thank you all very much.

Opening remarks
by MR H S CHERIF
Special Assistant to the Director General, IAEA
at the Silver Jubilee Celebration of RCA
Yangon, March 10,1997

Mr Minister, distinguished representatives and guests of RCA Member States, ladies and gentlemen.

I am indeed honoured and pleased to represent the IAEA's Director General in these ceremonies for the celebration of the 25th Anniversary of the establishment of the Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology for the Asia and the Pacific Region (RCA).

Under the terms of this Agreement, which came into force 25 years ago, and which is presently supported by 13 countries for another 5 years extension, participating countries aim to setup an effective collaboration between relevant National Institutions of the Region. The role of the International Atomic Energy Agency is to provide, organizational, administrative, advisory, technical and financial assistance.

The RCA's approach to the complex problem of promoting adequate technical co-operation and achieving an effective technology transfer is the result of an evolutionary process. In the field of nuclear technology, formal co-operation dates back to 1963 with the India-Philippines-Agency (IPA) Project, later joined by Thailand.

It was in the early seventies that the promotion of mutual self-assistance and co-operation was considered to be beneficial in technology transfer, bringing along the concept of regional projects involving input from countries of a given geographical area. The recognition of the potential advantages of mutual co-operation by the countries in East Asian and Pacific Region, as well as by the Agency led to the formulation, 25 years ago, of a Regional Co-operative Agreement.

If we look back at the past 25 years, we are impressed by the acceleration in the number of projects, progressively brought within the frame of the Agreement. Since the beginnings of the RCA, when the first project on food irradiation was started, activities have been gradually and continuously expanding and today a total of 24 regional projects are under way. They cover such diversified areas as health care, radiation sterilization, radiation protection, environmental protection, industrial growth and tracers and nucleonic control systems.

With the expansion of the RCA activities, the number of scientists and technicians of RCA Member States involved in the different projects has grown to several thousands. The budget for the 1996 RCA programme in terms of in-cash contributions amounts to US$3.7 million, but this is immensely increased still by all the other contributions of the participating countries. So, the costs of RCA projects are largely met by the participating countries today. In this connection, I would like to thank not only the long-standing major donors of RCA, namely Japan and Australia, but all participating countries for their contributions and valuable support in terms of funds, equipment, facilities and experts. I hope that this will be continued in the future and, if possible, be further increased.

Mister Minister, ladies and gentlemen. The RCA started out as an experiment for the countries in the Region as well as for the Agency. The experience of 25 years has not only shown its potential for co-operation and mutual assistance for promoting an effective technology transfer in the Asian Region, but also served as an example for the other two regional co-operation agreements in Latin America and Africa. I think that all of you can feel proud of the achievements of these 25 years and I hope that the experience will be used for your mutual benefit for many years to come.

Thank you.

RCA- A WINDOW TO THE FUTURE
by C.R. ALETA, RCA National Coordinator, Philippines
(Delivered during the 25th Anniversary of the RCA, Yangon, Myanmar 10 March 1997)

Distinguished Guest, Ladies and Gentlemen:

I have been asked to say something about the history of RCA - this acronym stands for Regional Cooperative Agreement for Research, Development and Training in Nuclear Science and Technology in Asia and the Pacific. Perhaps the reason why someone from the Philippines is being asked to do the historical narration is that we could say that the precursor of the RCA was the Philippine-based project known as the IPA - a tripartite cooperative agreement involving India, the Philippines, and the Agency (the International Atomic Energy Agency) which started in the mid-60s. The IPA involved the supply of a neutron diffractometer facility from India, set up in the Philippine research reactor, and was used to train scientists and technologist in physics (e.g., solid state physics, and neutron elastic and inelastic scattering). Participants who were trained came from Korea, Taiwan China, Thailand, Indonesia and the Philippines' Dr Q O Navarro, who later became Director of the Philippine Nuclear Research Institute, was then appointed Project Director.

This cooperative project proved very beneficial and attractive that discussions on regional cooperation were further made in Bandung, Indonesia in 1970. It was not until 12 June 1972 when the RCA was officially established mainly to "promote and coordinate cooperative research, development and training projects in nuclear science and technology through the appropriate institutions". The RCA Agreement was originally for five years, from 1972 to 1977; this has been extended four times, five years each extension and is now on its 25th year. Another extension, the fifth from 1997 to 2002 seems to be in the horizon since a majority of the Member States had already recommended its extension.

The original RCA Member States initially involved ten (10) countries. The earliest signatories to the original agreement, according to the records we have seen were the following: India (7 June 72), Vietnam (12 June 72), Indonesia (16 Oct 72), Thailand (4 Dec 72), Philippines (17 April 73), Singapore, Pakistan (6 Sept 74), Korea (9 Oct 74) Bangladesh (23 Oct 74) and Sri Lanka (9 Mar 76); now there are seventeen (17) which are as follows: Australia, Bangladesh, People's Republic of China, India, Indonesia Republic of Korea, Japan, Malaysia, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Vietnam. The newest members are Mongolia (1992), Myanmar (1994) and New Zealand (1994).

The RCA Agreement has the IAEA as a partner, not a party. It is one of three regional cooperative agreements under the aegis of the IAEA. The other two are ARCAL for Latin America, formed in 1984, and AFRA, for Africa, formed in 1990. Of the three agreements, the RCA can be considered the most mature, most committed, and enviable. It is most mature being the longest, not necessarily the oldest, running regional agreement - in its 25th year now; it is most committed since many Member States are now not only participating actively in its activities but also contributing financially to support projects; it is enviable since it is a model for other regional projects and is a pioneering approach to technical cooperation among developing countries (TCDC) in the United Nations system.

Donor Countries

The initial donor countries have been only Japan and Australia since 1979. India, itself a developing country began supporting RCA as donor country in 1983; Republic of Korea followed in 1986; China in 1988. There are now a total of ten (10) donor countries within the region: Australia, Japan, India, Republic of Korea, China, Malaysia, Indonesia, Philippines, Thailand and New Zealand. It is noted that six(6) donor countries fall within the category of developing economies.

Coordinators

The RCA program was assigned a Coordinator by IAEA. In its beginnings there was no full time RCA Coordinator. The program was administered by the Department of Research and Isotopes and the Technical Officer who served as the first RCA Coordinator was Dr Arthur Palmer (Australia) from 1971-75. He was working with Dr David Richman and former DDG, Dr Glubrecht. Dr Palmer was followed by Dr Emil Eugene Fowler (USA), Head of the Industrial Applications and Chemistry Section, IAEA, who served as Coordinator from 1975-80. Next was Dr Sueo Machi (Japan), Head of the Industrial Applications and Chemistry Section, IAEA, who coordinated the RCA program from 1980-83. The first full-time RCA Coordinator was Dr Masatoshi Kobayashi (Japan), former Director General of Takasaki Research Facility, Japan, who served RCA from 1983-85. He was followed by Dr Peter Airey (Australia) from 1985-90 and Dr John Easey (Australia) from 1990-95. When Dr Easey left, and before the appointment of the present Coordinator, there were two acting Coordinators: Mr Javed Aslam (Pakistan) of the Technical Cooperation Division and Dr M N Razley, who succeeded Mr Aslam. In the span of 25 years the RCA saw eight (8) changing of the guards in the RCA program. During this period there was only one changing of the guard in Director Generalship of the IAEA - from Dr Sigvard Eklund to the incumbent, Dr Hans Blix, in 1981.

Other Players

Aside from the Coordinators, there are also other players who helped move the RCA forward. It will not be possible to enumerate all but some of them are as follows: the **IAEA technical officers** who are instrumental in giving guidance in the implementation of projects; also their expertise is availed of in advising, training, monitoring and even preparing new proposals - they are too numerous to mention here; the **RCA Steering Committee members** who set directions, review the progress of the implementation - they might be fading away from the scene; the **Deputy Director General of the Department of Technical Cooperation** who within the framework of this Department, among other things, provides parallel support to RCA projects in the form of country support for fellowships, experts and equipment; exercises supervision over the RCA program; the **Deputy Director General of the Department of Research and Isotopes** who provides research contracts and logistical support to technical officers, the main mechanisms for carrying out research activities in the region; **UNDP Project Officers/Project Coordinators/Advisors/Chief Technical Officers,** who took turns and provided the overall handle in the implementation of a long-running UNDP-assisted project, implemented by the IAEA; the **Expert Section** of the IAEA, which recruit and handle the selection, assignment and logistics of experts; the **National Nuclear Institutes** who provided the link, the technical backstopping, the financial and administrative support, the manpower and other resources in the implementation of projects; the **National Counterparts and Coordinators,** the frontliners who make things happen or unhappen in some cases; and the **end users and clients** who are the ultimate recipient of the technologies developed or transferred within RCA.

Achievements and Highlights

Some of the major activities and achievements of the RCA are in the areas of food and agriculture, medicine and health, industry and nuclear energy in general.

The first regional project was the Asian Regional Project on Radiation Preservation of Fish and Fishery Projects which started in 1973 - this technology on food irradiation saw several phases of work; this is still ongoing but the emphasis of work changed over the decades from pilot to demonstration to process control. Now commercial facilities for food irradiation exist in some Member States (Korea and Pakistan, originally for medical sterilization); large scale demonstration food irradiators in Bangladesh, Philippines, Thailand, China and Vietnam; and planned in others.

The biggest project was the UNDP/IAEA/RCA regional industrial project which brought awareness of and subsequent applications of several technologies that industry could use: nondestructive testing techniques; tracer techniques and nucleonics control system; and radiation processing. In the last phase of the project, nuclear analytical techniques for environmental sample analysis were also introduced.

The other highlights and outstanding results of the cooperative projects are the following:

In Agriculture:
- commercial food irradiator in Korea and Pakistan
- large scale demonstration food irradiation in Bangladesh, Philippines, Thailand, Indonesia, China, and Vietnam
- more than 500 radiation-induced cultivars released by developing countries
- introduction by ELISA in animal diseases and RIA in hormonal levels

In Medicine:
- publication of an atlas on liver images and an atlas on radioaerosol lung imaging in clinic pulmonary disease
- introduction of RIA in laboratories in the region (diagnosis of hepatitis B, etc)
- establishment of tissue banks in some countries in the region (e.g. Philippines, Indonesia, Malaysia, Sri Lanka, etc)

In Industry:
- application of nucleonic control system (NCS) in pulp and paper industries in Thailand, Malaysia, Korea, India and others, for thickness and moisture measurement; training and demo facility established in paper company in Thailand
- establishment if NCS and training and demonstration facility at an Indian Steel plant
- installation of NCS in mines in Philippines, Malaysia, Thailand and India for training and demonstration purposes
- regionally recognized nondestructive testing training and certifications schemes
- 13 countries out of 17 have commercial radiation facilities for industrial radiation sterilization

Major Issues and Concerns

Regional management has been discussed each time there is a change of stakeholders in the Agreement. As early as 1987 the issue surfaced and again in the last few years. An effective regional management mechanism should be continuously pursued.

The concept of establishing regional centers had also been raised earlier. The Jakarta UNDP Office was considered an example of this. We should thank the

Indonesian Government, through BATAN, for hosting the Industrial Project throughout the lifetime of project.

The Future of the RCA

We have a saying in the Philippines which says that a person will never know where he or she is going if he [or she] does not know how to look back where he or she come from. So we are here today to look back at the history of RCA, to reminisce about its accomplishments, its ups and downs, to see where it now stands and decide where we, the Members States, want it to go.

I personally envision an RCA in which TCDC is a by-word, where there is an increase in membership not only in name but in commitments, with a stronger regional management, with much better and bigger projects, strengthened regional centers of excellence and regional resource units, harmonized standards and regulations related to nuclear energy applications in the region, and more independence in doing things.

What will the next 25 years or more bring? Will RCA still remain? The answer is in our hands - the Member States.

In closing, let me quote from former DDG, TC, Normally bin Muslim during the 17th General Conference of Representatives in September 1998, who said "RCA will continue to flourish as long as it is firmly based on projects which are clearly recognized to be of importance to the region". So far we believe we have done just that. And we hope to continue doing so.

Thank you all!