

REGIONAL CO-OPERATIVE AGREEMENT  
INTERNATIONAL ATOMIC ENERGY AGENCY



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# REPORT

TWENTY-SIXTH GENERAL CONFERENCE MEETING  
OF  
REPRESENTATIVES OF RCA MEMBER STATES

IAEA - Vienna, 1 October 1997

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# **REPORT**

**TWENTY-SIXTH GENERAL CONFERENCE MEETING  
OF  
REPRESENTATIVES OF RCA MEMBER STATES**

**IAEA - Vienna, 1 October 1997**

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**MINUTES**  
**OF**  
**THE 26<sup>TH</sup> GENERAL CONFERENCE MEETING**  
**OF REPRESENTATIVES OF RCA MEMBER STATES**

**1 OCTOBER 1997 AT VIC, C07, CONFERENCE ROOM II**

The Meeting was attended by 36 delegates representing all 17 RCA Member States (**Annex 1**). Two Deputy Directors General and 22 other IAEA staff members as well as a representative from UNDP also attended this Meeting.

Mr. Tin Hlaing, National RCA Co-ordinator of Myanmar, was unanimously elected Chairman. The proposed Agenda was adopted (**Annex 2**).

**1. Opening Remarks**

DDG-TC Mr. Qian Jihui in his welcoming address (**Annex 3**) congratulated participants on the Silver Jubilee of the RCA and referred to the many accomplishments recorded by this intergovernmental agreement since its inception. He had suggested that in its activities the RCA as well as the two other regional agreements should target the regional market, make use of the new delivery mechanism focused on clearly defined problems and end users of technology and extensive use of regional technical capacity and experience, and ensure the sustainability of nuclear applications on the basis of their usefulness. Mr. Qian welcomed the thematic approach in programming RCA activities in some subject areas and encouraged the efforts of RCA Member States to take on more of the responsibilities for programme formulation, funding and implementation. He referred to the new joint UNDP/RCA/IAEA project and expressed the hope that RCA Member States would join with the IAEA in providing the necessary resources for the project. Finally, Mr. Qian referred to potentially serious financial constraints faced by the Agency and to declining cash contributions of RCA Member States and underlined

the particular importance for the RCA and the Agency to work together to find ways to put the concept of TCDC to work to achieve maximum cost-effectiveness.

DDG-RI Mr. S. Machi congratulated participants on the 25<sup>th</sup> Anniversary of the RCA and recalled a number of especially successful RCA projects. He expressed the view that RCA would place more emphasis on the application of nuclear techniques for sustainable development of industry, agriculture and environmental protection. Mr. Machi assured the participants that in the years to come his Department would fully co-operate with RCA Member States in the formulation and implementation of projects related to technical co-operation and co-ordinated research activities (**Annex 4**).

## **2. RCA Annual Report 1996**

The RCA Annual Report 1996 as circulated was presented by DIR-TCPB Mr. P. Barretto. A summary of the presentation is included in **Annex 5**. The meeting recalled that according to Recommendation 5 of the Report of the Review of the RCA Management Structure as endorsed at the RCA GCM in 1996 future RCA Annual Reports should consist of the following 3 parts: 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; and 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 Myanmar WGM in March 1997 agreed that the information sought from RCA Member States for the Annual Report was too detailed and that a standardized format should be developed which should emphasize policy aspects, project impacts and achievements, and in-kind contributions. The meeting endorsed the above agreement. The Australian delegate offered to assist in drafting a standardized format for contributions from Member States to the Annual Report and this was agreed.

The RCA Annual Report 1996 was adopted.

3. **Report of the 19<sup>th</sup> RCA Working Group Meeting, Yangon, Myanmar, 10-14 March 1997**

The Chief Rapporteur of the Working Group Meeting, Mr. J. Rolland, National RCA Co-ordinator of Australia, presented the report as circulated. The delegate from the Republic of Korea requested a change to be made in the Report under item 8c. *Research Reactor, Energy Based and General, paragraph 2, lines 5 and 6, namely to delete the sentence: Korea indicated its further extrabudgetary financial support for these projects.*

The Report of the 19<sup>th</sup> RCA Working Group Meeting was adopted.

4. **RCA in the Next 25 years**

The paper on this subject as circulated (**Annex 6**) was presented by Mr. A. Djalois, National RCA Co-ordinator of Indonesia, who indicated that very few written inputs had been received from RCA Member States. The paper was therefore based on the discussions on the RCA future directions conducted at the Myanmar Working Group Meeting, additional views submitted thereafter by some Member States and on the thoughts of the author himself. During discussion there was a clear indication of broad support for the "vision" outlined in the paper and a desire to further elaborate the future directions of the RCA. It was agreed that Member States would forward any comments in writing to Mr. Djalois by 30 November 1997 to be collated and presented for further discussion at the 20<sup>th</sup> Regular Meeting of RCA Representatives to be convened in Wellington in March 1998. It was further agreed that a copy of these comments be forwarded to the RCA Co-ordinator.

5. **Development Finance and the RCA**

Mr. P. Roberts, National RCA Co-ordinator of New Zealand, presenting the previously circulated paper on this subject (**Annex 7**) underscored that very little input was received from RCA Member States and therefore this paper was almost a personal view of the author. The Meeting took note of all views expressed by the participants in the course of discussion, including the comments made by DDG-TC, adopted the paper subject to the incorporation of Mr. Qian's proposals and requested the RCA Co-ordinator to pursue further the accomplishment of the recommendations proposed in the paper. Member States were requested to submit to the RCA Co-ordinator information to build up the database on the sources of development finance available in the Region.

6. **Locating a Senior RCA Representative in the Region**

Mr. J. Rolland, National RCA Co-ordinator of Australia, presented the paper on Regional Representation for the RCA Programme as circulated (**Annex 8**). He noted that the recommendation to locate a senior RCA representative in the Region had been endorsed in principle at the 25th GCM as part of the Report of the Working Group to Review the Management Structure of the RCA Programme. The Myanmar WGM had however asked for three aspects of the regional representation to be considered in more detail, i.e. the relative functions of a future regional representative and the present RCA Office, and the relationship between these positions; funding of the proposed regional position; and its location. Mr. Rolland noted that the proposal for the new UNDP/RCA/IAEA Project to include a project management officer in the region would provide a useful opportunity to gain experience with regard to a regional representative having wider responsibilities in due course. This view was shared by the representatives of Indonesia, New Zealand and to a certain extent the Republic of Korea. The representative of Pakistan expressed reservations on the appointment of a senior representative in the Region and a project officer for the joint UNDP/RCA/IAEA project on the grounds that the proposed roles of these two

positions did not provide sufficient justification of the financial implications. The representative of Japan also indicated that the role of the regional representative, legal aspects and financial implications needed to be clarified. Overall, however, there was strong support for transferring more RCA Management responsibility and ownership to the region.

Mr. Rolland undertook to develop a further paper on the issue for consideration at the Wellington Meeting of RCA Representatives which took account of the previous decision in principle to station a senior RCA representative in the region with a target date of January 2000 and the proposed regional position for the UNDP/RCA/IAEA Project. Mr. Barretto advised the Agency was seeking legal advice on the issue which he would make available to Mr. Rolland.

#### **7. RCA Guidelines and Operating Rules**

Mr. H.S. Cherif, Special Assistant to the Director General, presented the previously circulated revised draft of the Guidelines and Operating Rules for the RCA Programme. The draft incorporated the comments made during the 19<sup>th</sup> Meeting of National RCA Representatives in Myanmar as well as those received in writing after the Meeting. Mr. Cherif noted that the document was based mainly on the RCA Agreement and the recommendations of the Working Group on RCA Management Structure. It did not spell out the priorities of the RCA Programme as these should be defined by RCA Member States in light of their common interests and needs in a given period of time. Mr. Cherif noted also that the Operating Rules needed to be updated periodically and that the formats for most of the reports and other papers referred to in the document needed to be developed and standardized.

The meeting adopted the Guidelines and Operating Rules for the RCA Programme subject to some editorial comments to be presented by the Representative of Australia. The final version of the document incorporating the said comments is attached as **Annex 9**.

8. **TCDC Activities**

Mr. A. Sobri, National RCA Co-ordinator of Malaysia, presented the circulated paper "TCDC in the RCA Programme" which reviewed recent developments in the implementation modality within the RCA (**Annex 10**). The paper was agreed for submission to the Tripartite Meeting to be held on 2 October. Mr. Rolland drew attention to the set of 15 recommendations for facilitating TCDC as endorsed at the 1996 RCA GCM and also the additional six recommendations arising from the Tripartite Meeting held on 19 September 1996. These recommendations needed to be followed up. It was agreed that the RCA should be represented at the Tripartite Meeting on 2 October by Messrs. Sobri, Aleta, Djaloeis and Rolland.

9. **Terminal Tripartite Review Meeting on UNDP/RCA/IAEA Project**

Mr. P. Roberts presented the previously circulated Report of the Tripartite Meeting held in Jakarta on 15-16 July 1997 (summary is given in **Annex 11**). The Meeting adopted the Report without discussion and modification.

10. **Status of New Joint UNDP/RCA/IAEA Project**

Mr. J. Lodding, TCCPS, presented the paper (**Annex 12**) showing major actions taken on the New Joint Project since the 19<sup>th</sup> RCA Working Group Meeting held in Yangon in March 1997. Mr. D. Smith, UNDP representative in Vienna referred to environment protection and regeneration as one of the focuses of the current UNDP activities and stressed the importance of co-operative and cost-sharing arrangements for UNDP funding. Both presentations were noted by the Meeting as a helpful background for subsequent discussion of the options available under the New Joint Project. Representatives of Indonesia, Philippines and Japan expressed their disappointment over UNDP non-funding of the two sub-projects proposed by RCA Member States as high regional priorities - access to clean drinking water and energy

efficient, cleaner and competitive industry - as well as over considerable reduction of UNDP funding for the New Joint Project.

The Australian delegate advised that it was looking positive that Australia would be in a position, subject to final approvals, to financially support two components of this UNDP project in particular the Coastal Zone Marine Pollution project to the value of A\$500,000 over 3 years and also the Electronic Networking and Outreach project in particular in terms of distance learning and education in the strengthening of radiation protection infrastructures to the value of A\$485,000 over three years.

#### 11. **Options for the New Joint Project**

Mr. P. Roberts presented the paper on the options for the new UNDP/RCA/IAEA project (**Annex 13**). Following extensive discussion the meeting agreed that the new Joint Project would comprise the following 5 sub-projects:

- i) Air Pollution Assessment with UNDP funding of US\$500,000 to the end of 1999. The sub-project would be based on a workplan endorsed by National Project Co-ordinators under previous activities related to Nuclear Analytical Techniques;
- ii) Marine Coastal Environment and its Pollution with UNDP funding of US\$250,000, Philippine cash contribution of US\$50,000 and, to be confirmed, Australian cash contribution of approximately US\$360,000 over three years. The sub-project would be based on a Project Formulation Meeting on Marine Contamination and Transport Phenomena (22-24 November 1995), a Philippine proposal to Address Specific Red Tide (Algal Bloom) Concerns, and an Australian proposal on Sustainable Development in the Coastal Zone;

- iii) Electronic Networking and Outreach with UNDP funding of US\$300,000 and Australian cash contribution, to be confirmed, of approximately US\$350,000. The sub-project would be based on the proposal of National Co-ordinators of the previous Nuclear Information System Project discussed at the 19<sup>th</sup> RCA Working Group Meeting, and an Australian proposal on distance learning and education in the strengthening of radiation protection infrastructures;
  
- iv) Access to Clean Drinking Water with funding to be drawn from IAEA funding and Member States cash and in-kind contributions. The sub-project would be based on activities to be decided at a Project Formulation Meeting;
  
- v) Energy Efficient, Cleaner and Competitive Industry with funding to be drawn from IAEA funding and Member States cash and in-kind contributions. The sub-project would be based on activities to be decided at a Project Formulation Meeting. These activities should include the Japanese/Malaysian proposal on Agro-waste and, subject to requiring no change, the activities already agreed under the RCA project RAS/8/078 “Nucleonic Control Systems and Tracers in Industry”.

The meeting requested the Agency to -

- a) take urgent steps to convene Project Formulation Meetings for sub-projects iv) and v) above. These Meetings should comprise a small group of experts and include representatives of end-users;

- b) finalize a Project Document to be sent as soon as possible to the UNDP;
- c) consult with UNDP with a view to submitting a Project Document that indicates that the activities and workplan for sub-projects iv) and v) above would be advised after the PFMs had taken place. The justification for this was the need for RCA to re-assess its overall workplan in view of the decision of UNDP not to fund two sub-projects that were the first two priorities of RCA;
- d) consider the need, costs and possible job description for position of Chief Technical Officer/Project Manager;
- e) consider the incorporation within the new Joint Project the activities approved under the RCA project RAS/8/078.

The Meeting also noted that :-

- a) until the question of a CTO/Project Manager was resolved, the Agency funds should be reserved for this purpose and not committed to other Project activities;
- b) the workplan for the Marine Coastal Environment sub-project based on the earlier PFM needed substantial revision to fit the reduced budget available;
- c) prior to the PFMs to be held on sub-projects iv) and v) above, Member States should urgently consider the activities to be carried out in these sub-projects and the cash and in-kind contributions that they could offer.

12. **RCA Activities and Budget in 1997 and 1998**

Mr. P. Barretto presented the RCA activities and budget in 1997 and 1998 (**Annex 14**). The meeting noted this information prepared by the Agency.

13. **Reformulation of Health Care Project.**

Mr. A. Djaloeis outlined the results of the Expert Meeting convened in September 1997 in Jakarta to develop a sectoral strategy for nuclear medicine in health care relevant to the region, to identify areas of activities in solving these health care problems using nuclear techniques, and to develop a corresponding plan of actions. It was the first time that such a meeting involved not only specialists in nuclear medicine, but also health care planners and policy-makers from RCA Member States and representatives of donor organisations. Mr. Djaloeis listed the health care priorities defined by the meeting and referred to its recommendations. After that Mr. R. Kamel, Project Officer, TCAPS, presented the workplans proposed by the meeting.

The meeting adopted the reformulated programme of health care activities.

14. **RCA Proposed Programme for 1999-2000**

Mr. A. Rogov, RCA Office, presented the list of 7 operational RCA projects to be continued in 1999 and 2000 including 2 projects going through to the year 2001 (**Annex 15**). He referred to the three project proposals in agriculture and one in radiation processing tabled at the RCA WGM in Myanmar for which no follow-up actions had been taken by the RCA Member States so far. Mr Rogov noted the need for new project proposals for 1999-2000 to be submitted to the Agency in a fully formulated form by 31 May 1998. Mr Rolland advised that to achieve this, and in line with the envisaged new management structure for the RCA, there was an urgent need

to establish thematic National Co-ordinators Meetings in the five thematic areas of Industry and Environment, Health Care, Agriculture, Radiation Protection, and Energy Related and Research Reactors. The necessary thematic meeting in Health Care had recently been held in Jakarta on 1-5 September, and in Radiation Protection in Korea on 24-28 February 1997. Mr Rolland proposed that the initial lead Member States or focal points for the five thematic areas be:

Industry and Environment - Japan

Health Care - Indonesia

Agriculture - China

Radiation Protection - Australia

Energy Related and Research Reactors - Republic of Korea

It was therefore necessary for the thematic meetings in the Industry and Environment, Agriculture, and Energy Related and Research Reactors areas to be held quickly and before the end of the year.

The meeting agreed to this proposal.

Mr. Kamel advised that recently there was a regional meeting in Republic of Korea on thematic approach in agriculture with emphasis on mutation breeding. Nine experts from the region were present. Based on the outcome of this meeting a project proposal was prepared by the Agency. It was suggested that RCA Member States might wish to use it as a resource document for their proposal for 1999-2000. A summary of the proposal was requested to be circulated to representatives of Australia, China and Republic of Korea. The latter two countries agreed to study the proposal and advise the Agency of their view.

New Project proposals were submitted by Pakistan for consideration.

15. **Country Statements**

The Country Statements as received from 15 RCA Member States are attached as **Annex 16**.

16. **Extension of RCA Agreement**

Mr. Rogov advised that according to its terms the extension document for the 1987 RCA Agreement entered into force and the Agreement was extended for a further five-year period with effect from 12 June 1997. He presented a table (**Annex 17**) showing that as at 25 September 1997 six RCA Member States had not yet adhered to the extension of the Agreement. Representatives of these countries indicated that the delay was due to national procedures established for the extension of intergovernmental agreements.

17. **RCA 25<sup>th</sup> Anniversary**

The meeting noted the information on this issue presented by representatives of Japan and the Philippines. The booklet "RCA: A window to the future" edited by the Philippines was distributed to the participants in the Meeting. It was agreed that the remaining copies of the booklet should be distributed equally among National RCA Co-ordinators.

18. **Venue and Date of the 20<sup>th</sup> Regular Meeting of National RCA Representatives**

Mr. Roberts confirmed the invitation by New Zealand for the next Meeting of RCA Representatives to be held in Wellington, 30 March - 3 April 1998. The invitation was accepted.

**List of Participants to the 26th General Conference Meeting of RCA Representatives**

| NO. | COUNTRY    | PARTICIPANTS   |
|-----|------------|--|
| 1.  | Australia  | <p>Mr. John Rolland<br/>(National RCA Representative)<br/>Director, Government and Public<br/>Affairs Division ANSTO</p> <p>Mr. Maurice Ripley<br/>Counsellor (Nuclear)<br/>The Permanent Mission of<br/>Australia to the IAEA, Vienna</p>   |
| 2.  | Bangladesh | <p>Mr. M.A. Quaiyum<br/>Chairman<br/>Bangladesh Atomic Energy<br/>Commission (BAEC)</p> <p>Mr. C.S. Karim<br/>Chief Scientific Officer<br/>Bangladesh Atomic Energy<br/>Commission (BAEC)</p>  |
| 3.  | China      | <p>Mr. LI Donghui<br/>Deputy Director General<br/>Bureau of International Co-<br/>operation, State Atomic Energy<br/>Authority, Beijing</p> <p>Mr. Xu Naicheng<br/>Director<br/>Division of International<br/>Organizations<br/>China Atomic Energy Authority<br/>(CAEA)</p> <p>Mr. Zhu Jiang<br/>(National RCA Representative)<br/>Bureau of International Co-<br/>operation<br/>China Atomic Energy Authority<br/>(CAEA)</p> <p>Mr. Zheng Kemin<br/>Advisor<br/>The Permanent Mission of China<br/>to the IAEA, Vienna</p> |

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|----|-------------------|--|
| 4. | India             | Mr. V. Ashok<br>Director<br>External Relations<br>Department of Atomic Energy<br>Mumbai  |
| 5. | Indonesia         | Mr. A. Djaloelis<br>(National RCA Representative)<br>Deputy Director General<br>National Atomic Energy Agency<br><br>Mr. Widjang H. Sisworo<br>Director of Programme<br>Development Bureau<br>BATAN Jakarta<br><br>Mr. Suhartono Zahir<br>Scientific Attache<br>The Permanent Mission of<br>Indonesia to the IAEA,<br>Vienna |
| 6. | Japan             | Mr. Iizawa Yoshitaka<br>Assistant Director<br>Science and Nuclear Energy<br>Division<br>Foreign Policy Bureau<br>Ministry of Foreign Affairs<br><br>Mr. Yoshinori Izumi<br>Special Assistant<br>The Permanent Mission of<br>Japan to the IAEA,<br>Vienna   |
| 7. | Republic of Korea | Mr. Mun Ki Lee<br>(National RCA Representative)<br>Director<br>Atomic Energy International Co-<br>operation Division<br>Ministry of Science and<br>Technology (MOST)<br><br>Mr. Sung-Kwang Yang<br>Deputy Director<br>Atomic Energy International Co-<br>operation Division<br>Ministry of Science and<br>Technology (MOST)  |

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| 8.  | Malaysia | <p>Mr. Ahmad Sobri Hj. Hashim<br/>(National RCA Representative)<br/>Director General<br/>Malaysian Institute for Nuclear<br/>Technology Research (MINT)</p> <p>Mr. Nahrul Khair Alang Md.<br/>Rashid<br/>(UNDP National Counterpart)<br/>Deputy Director General<br/>Malaysian Institute for Nuclear<br/>Technology Research (MINT)</p> <p>Mr. Raja Abdul Aziz Raja Adnan<br/>Scientific Attache<br/>The Permanent Mission of<br/>Malaysia to the IAEA, Vienna</p> |
| 9.  | Mongolia | <p>Mr. Ganzorig<br/>Executive Secretary<br/>Nuclear Energy Commission<br/>Mongolia</p> <p>Mr. G. Jargalsalkhan<br/>First Secretary<br/>The Permanent Mission of<br/>Mongolia to the IAEA, Geneva</p>   |
| 10. | Myanmar  | <p>H. E. Mr. Tun Ngwe<br/>Resident Representative of<br/>Myanmar to the IAEA, Bonn</p> <p>Col. Aung Myint<br/>Ministry of Defence<br/>Yangon</p> <p>Mr. Ba Myint<br/>Pro-Rector<br/>Yangon Institute of Technology</p> <p>Mr. Tin Hlaing<br/>(National RCA Representative)<br/>Secretary<br/>Myanmar Atomic Energy<br/>Commission<br/>Yangon</p>   |

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| 11. | New Zealand | Mr. Peter Roberts<br>(National RCA Representative)<br>Manager, Industrial and<br>Biological Nuclear Sciences<br>Group<br>Institute of Geological and<br>Nuclear Sciences (IGNS)   |
| 12. | Pakistan    | Mr. Hasibullah<br>(National RCA Representative)<br>Director<br>International Affairs and<br>Training<br>Pakistan Atomic Energy<br>Commission  |
| 13. | Philippines | Mr. Carlito R. Aleta<br>(National RCA Representative)<br>Director<br>Philippines Nuclear Research<br>Institute (PNRI)   |
| 14. | Singapore   | Mr. Ho Cheng Hoon<br>Senior Engineer (Strategic<br>Planning)<br>Ministry of the Environment<br><br>Mr. Steven Chong<br>Director<br>Radiation Protection<br>Inspectorate<br>Ministry of Health                                     |
| 15. | Sri Lanka   | Mr. M. Prinath Dias<br>Chairman<br>Atomic Energy Authority (AEA)<br><br>Mr. H.G.P. Karunaratne<br>Head, IAEA Division<br>Atomic Energy Authority (AEA)  |
| 16. | Thailand    | Mr. Anan Yuthamanop<br>Deputy Secretary General<br>Office of Atomic Energy for<br>Peace (OAEP)<br><br>Mrs. Yoawaluck Leenanupan<br>Head, Planning and Foreign<br>Relations Section<br>Office of Atomic Energy for<br>Peace (OAEP) |

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| 17. | Viet Nam | <p>Mr. Bui Van Tuan<br/>Deputy Director General<br/>Viet Nam Atomic Energy<br/>Commission (VAEC)</p> <p>Mr. Bui Van Hung<br/>Director<br/>Department of Planning and<br/>International Relations<br/>Viet Nam Atomic Energy<br/>Commission (VAEC)</p> |
| 18. | UNDP     | <p>Mr. David Smith<br/>Senior Adviser<br/>United Nations Development<br/>Programme<br/>Vienna International Centre</p>  |

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**AGENDA**  
**TWENTY-SIXTH GENERAL CONFERENCE MEETING OF**  
**REPRESENTATIVES OF RCA MEMBER STATES**  
**09:00H WEDNESDAY, 1 OCTOBER 1997**  
**VIC, C07, CONFERENCE ROOM II**

1. Opening
  - 1.1 Remarks by interim Chairman - *Mr. Li Donghui (China)*
  - 1.2 Election of Chairman
  - 1.3 Statement by Chairman elect
  - 1.4 Welcome on behalf of the IAEA - *Mr. Qian Jihui, DDG-TC*
  - 1.5 Address by DDG-RI - *Mr. S. Machi, DDG-RI*
2. Adoption of Agenda
3. RCA Annual Report 1996 - *Mr. P.M.C. Barretto  
DIR-TCPB*
4. Report of the 19th RCA Working Group Meeting, Yangon, Myanmar, 10-14 March 1997 - *Mr. J. Rolland (Australia)*
5. Reports originating from the recommendations of the 19th RCA WGM
  - 5.1 RCA Management
    - 5.1.1 RCA in the next 25 years - *Mr. A. Djaloelis (Indonesia)*
    - 5.1.2 Development Finance - *Mr. P.B. Roberts  
(New Zealand)*
    - 5.1.3 Locating a senior RCA representative in the Region - *Mr. J. Rolland (Australia)*
    - 5.1.4 RCA Guidelines and Operating Rules - *Mr. H. S. Cherif, DG's  
Office*
  - 5.2 TCDC Activities - *Mr. Ahmad Sobri Hashim  
(Malaysia)*
  - 5.3 Joint UNDP/RCA/IAEA project
    - 5.3.1 Terminal Tripartite Meeting Jakarta, 15-16 July 1997 - *Mr. P.B. Roberts  
(New Zealand)*

|     |  |   |
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|     | 5.3.2 Status of the New Joint Project                                      | - Mr. J. A. Lodding, TCCPS                                |
|     | 5.3.3 Options for the New Joint Project                                    | - Mr. P.B. Roberts<br>(New Zealand)                       |
| 6.  | (a) RCA Activities and Budget in 1997 and 1998                             | - Mr. P.M.C. Barretto<br>DIR-TCPB                         |
|     | (b) Reformulation of Health Care Project                                   | - Mr. A. Djaloeis (Indonesia)                             |
| 7.  | RCA Proposed Programme for 1999-2000                                       | - Mr. P.M.C. Barretto<br>DIR-TCPB                         |
| 8.  | Country Statements   | - National Representatives                                |
| 9.  | Extension of RCA Agreement   | - Mr. P.M.C. Barretto,<br>DIR-TCPB                        |
| 10. | RCA 25th Anniversary   | - Focal point (Japan) and<br>Mr. C.R. Aleta (Philippines) |
| 11. | Venue and date of the 20th National<br>RCA Representatives Regular Meeting | - Chairman  |
| 12. | Summing-up of the decisions taken  | - Chairman  |

MEETING OF REPRESENTATIVES OF RCA MEMBER STATES

1 October 1997

WELCOMING ADDRESS

by

MR. QIAN JIHUI, DEPUTY DIRECTOR GENERAL  
DEPARTMENT OF TECHNICAL COOPERATION

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Distinguished RCA Representatives, Distinguished Observers, Ladies and Gentlemen, Mr. Chairman

It gives me great pleasure to welcome you to this 26th Annual Meeting of Representatives of RCA Member States. It is also my pleasure to congratulate you on the Silver Jubilee of this regional cooperative agreement, which happens to coincide with the 40th anniversary of the IAEA. The partnership RCA and the IAEA formed a quarter century ago has been marked by close cooperation, with the Agency providing technical, financial and administrative backstopping to a maturing RCA.

Since its inception, RCA has recorded many accomplishments. It has evolved from an inter-institutional network to an Inter-Governmental Agreement. As regional expertise developed, RCA's reliance on the Agency's technical guidance has greatly decreased. A third important sign of maturity is your de-emphasis of general manpower development in favor of a thematic, problem-solving approach. I will address this very significant development in more detail later.

As RCA matured, it expanded its membership and program. Its experience in regional cooperation is impressive and valuable. Many of its projects have contributed importantly to the dissemination of nuclear science and technology among developing countries. A special UN review gave high marks to RCA's accomplishments in this regard. Nonetheless, we must acknowledge that the facilities and skilled manpower that resulted from the cooperation between RCA and the IAEA are not being optimally utilized in many countries. Even nuclear and isotopic techniques that are proven tools for development in many sectors have not yet reached economic viability, defined as sufficient return on investment to be sustainable. I suggest to you that the only way to remedy this situation is to **target the regional market**. RCA can and should play a leading role in responding to the regional demand for nuclear applications, especially in countries with less well developed capacity. With your permission, I will expand briefly on this concept.

Mr. Chairman

Two years ago I recommended the adoption of new management principles to enhance the self-sufficiency and ownership of the three regional agreements. I am encouraged by the response from each region, given that different responsibilities exist for each organization, because a common goal is evident: greater responsibility for the formulation and implementation of TC projects.

Let me turn now to a **new delivery mechanism** that could help guide RCA into a new era by building on your own recent initiatives. This new mechanism consists of putting regional capacity to work to solve problems at the national level.

What factors drive the need for this new means of delivery?

First, the Agency has adopted a new programming strategy aimed at supporting national development. It is reflected in the term "Partner in Development." The new emphasis in the TC Programme is on problem solving. To do this, technical cooperation activities need to focus on clearly defined problems that can be solved by effective end users. In our terminology, **the end users of technology are the crucial last link in the**

**chain that delivers the benefits of nuclear technology to specific beneficiaries.**

In order for RCA, ARCAL, and AFRA to remain relevant to TC objectives, they must also adopt a pragmatic approach to programming that applies technical capacity and experience to solving well defined problems. **Identifying problems and solving them using existing regional capacity should become the main task of all three regional agreements.** This approach will encourage the more advanced institutions within the region to take leadership roles by sharing their facilities, expertise and basic know-how in problem solving for all RCA Member States.

Second, we must work together to ensure the sustainability of our counterpart institutes. I suggest to you that **the key to sustainability is usefulness.** And usefulness consists of taking operational roles in meeting the *demand* within a region, by solving real problems by means of nuclear and isotopic applications. Establishing clear “markets” for our applied technology must become a guiding principle for regional programme development, and a **prerequisite for expanding technical capacity.**

Recent developments underscore the value and practicality of this approach: next month an AFRA expert team, lead by an IAEA consultant, will visit Morocco and Namibia to investigate the causes of leakage from four reservoirs. Planning is underway to investigate six other dams in three more AFRA member states. While the details may vary somewhat according to individual circumstances, I believe this approach will have significant impact on all regional programming, and I urge you to study it in more detail. I strongly encourage RCA, ARCAL and AFRA to join with the IAEA in a new means of delivery, **one that uses regional capabilities to solve common problems not only at the national level but regionally as well.** This is the path to achieving the true spirit of TCDC.

Given this background, I applaud the thematic approach RCA is taking in the areas of human health and industrial applications. It is also my understanding that RCA has been discussing its future and particularly its management structure. The Agency encourages your efforts to shift to participating countries more of the responsibility for program formulation, funding, and implementation. We stand ready to help you meet these aims.

RCA  
1 October 1997  
09:00 hours

I am also pleased to note that the RCA joint project request entitled "Better Management of the Environment, Natural Resources and Industrial Growth through Radiation and Isotope Technology" was approved by UNDP on 17 August. Their approval illustrates that many nuclear energy applications remain competitive at a time of shrinking resources for multilateral assistance. Due to budget cuts, UNDP was not able to meet their initial expectations for funding, but did provide more than one million US dollars. We hope that the RCA Member States will join forces with the IAEA in providing the necessary resources to implement all of the project's important and worthy objectives in environment and industry.

Mr. Chairman

Allow me to conclude by noting that the Agency is now facing potentially serious financial constraints that could affect its ability to contribute to RCA activities. In addition, the cash contributions of RCA Member States to the RCA program have themselves been declining in recent years. Under these circumstances, it is particularly important for RCA and the Agency to work together to find ways to put the concept of TCDC to work to achieve maximum cost-effectiveness.

Thank you.

**Meeting of Representatives of RCA Member States  
1 October 1997**

**Opening Remarks by Mr. S. Machi  
Deputy Director General  
Department of Research and Isotopes**

First I would like to congratulate you to the 25th Anniversary of RCA this year. I recall that 15 years ago, when I was the RCA Co-ordinator, the 10th anniversary of RCA was celebrated in Malaysia. Prof. Mukaibo, former chairman of AEC Japan and Prof. Rammana, former chairman of the Indian Atomic Energy Commission, were invited to deliver a special lecture on prospects of nuclear energy application in RCA countries. Since then, RCA has made significant achievements in the application of nuclear technology for food and agriculture, industry, human health and radiation protection. The UNDP industrial project started in 1980 for the first time under RCA with a significantly high level of funding for NDT, radiation processing, isotope tracer technology, nucleonic control system for industry. All UNDP/RCA projects brought about excellent benefits to the industries in Member States. An excellent example of the recent success story of the first phase of the UNDP project is radiation vulcanization of natural rubber latex in Malaysia and India for commercial production. Medical products, such as surgical gloves and catheters, made of RVNRL are much safer than the conventional products. Allergies due to proteins can be avoided by this technology.

RCA will place more emphasis on the application of nuclear applications for sustainable development of industry and agriculture and environmental protection.

In the years to come I can assure that the Department of Research and Isotopes will fully co-operate with RCA Member States in the project formulation and implementation of the coordinated research and technical cooperation projects and I would like to wish you much success for RCA.

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## **RCA ANNUAL REPORT**

- **The Report is based on:**
  - Draft Annual Report as presented by the Agency at 19th WGM in Yangon in March 1997
  - Country Reports submitted just before or at the 19th WGM
  - Comments and proposals made at the 19th WGM
  - Written comments and proposals received from RCA Member States after the 19th WGM (*only two countries submitted comments*)
  - Additional statistics regarding UNDP contribution and RCA projects' implementation
- **The Report was circulated to RCA Member States on 6 August 1997**



# **RCA ANNUAL REPORT 1996**

## **MAJOR AMENDMENTS MADE IN THE REVISED REPORT**

◆ **Figures in Section 3.1 were amended to reflect final statistics on UNDP Project and financial transactions related to some RCA projects. As a result, the implementation rate as reflected in Section 3.1.1 has increased.**



# **RCA ANNUAL REPORT 1996**

## **MAJOR AMENDMENTS MADE IN THE REVISED REPORT (cont'd)**

◆ **Table presenting cash contributions to RCA Programme was updated (Annex 6).**

◆ **Table showing in-kind contributions by RCA Member States was included (Annex 7).**



# **RCA ANNUAL REPORT 1996**

## **MAJOR AMENDMENTS MADE IN THE REVISED REPORT (cont'd)**

◆ **The volume of the Report was reduced considerably, only essential attachments were retained.**

◆ **Glossary was included providing definitions of terms and concepts used in the report and for the Agency's Technical Co-operation activities in general.**

# RCA GENERAL CONFERENCE MEETING, 1997 AGENDA ITEM 5.1

## RCA IN THE NEXT 25 YEARS

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### **1. INTRODUCTION**

This year 1997 marks the Silver Jubilee of the RCA. A special celebration of this Anniversary was kindly hosted by the Government of Myanmar during the RCA Working Group Meeting (WGM) last March in Yangon. Additional activities to highlight the RCA Silver Jubilee were proposed and agreed, such as those that we witness during this week at the IAEA General Conference here in Vienna.

Outstanding achievements of the RCA during the past 25 years are reported by the individual Member States in the RCA Silver Anniversary Book. Indeed, the RCA has brought significant benefits, not only to the individual Member States, but also to the region as a whole. While assessing the results and the impacts so far achieved by the RCA, it would be wise at this important event of the RCA Anniversary to look to the future, on how the RCA programmes could still be better planned, implemented and assessed, in order to better cope with the rapidly changing world situation, in particular in the Asia-Pacific region.

This paper is based upon the results of the discussion on the future directions of the RCA conducted during the Yangon RCA WGM, additional views expressed thereafter in writing by some Member States and that of the author. Since the majority of the Member States have so far not submitted their views on this matter, the paper should be regarded as a trigger to stimulate further thoughts which are of crucial importance for the RCA's future, such as what should be the appropriate vision of the RCA for the next 25 years, what major objectives should be pursued, what would be the optimal strategy to achieve those objectives, what are the appropriate programmes to be carried out and how to secure the necessary resources: technological, human and financial.

### **2. THE ASIA-PACIFIC REGION**

The impacts of the revolutionary progress of Science and Technology (S&T) in the late part of the second half of this century on the life of humanity on this planet earth, on the environment and on the S&T itself have been spectacular. Due to the rapid progress in the transportation and telecommunication systems, the planet earth itself seems to be growing smaller each day, the streams of goods, messages and people moving within and across national boundaries in many parts of this world demonstrate an unprecedented steep rise. The physical boundaries between nation states seem to be disappearing rapidly. The world is entering the era of information technology and is moving towards becoming one single integrated and complex interdependent network in which Science and Technology plays a key role.

In the above scenario, the Asia-Pacific region is slowly but steadily growing in importance. With their vast human and natural resources, strategic geographical locations and backed by Science and Technology, the nations in the Asia-Pacific region have a tremendous potential in becoming the most dynamic, even leading, nations of the world in the 21st century. It is an exciting challenge to the strategic thinkers, the decision makers, the scientists & engineers and, indeed, all the peoples of the region to transform the potential into a living reality! The RCA has an important role to play in this endeavour.

In order to achieve the above objective, therefore, bilateral as well as multilateral links and collaborations among the Asia-Pacific countries, in particular TCDC, should be enhanced and focused among others towards providing optimal solutions to the following questions:

- How to maintain **peace** and **socio-political stability** in the region, thus giving to the peoples of the region the feeling of security and safety, which is a basic condition for economic activities and progress?

In view of the expected increase of the use of nuclear power in the Asia-Pacific region in the future, the role of the RCA as a harmonious and strong nuclear science and technology community, working through consensus, may be further developed into an effective tool to provide assistance in solving problems concerning the peaceful and safe application of nuclear power in the Asia-Pacific region.

- How to accelerate **economic growth**, in particular through **industrialization**, and at the same time provide **equal opportunity** to the people of the region to improve their living standard?

In the future the RCA can also play an increasingly important role in assisting the developing and newly developing Member States to improve their appropriate nuclear technological facilities, human resources and supporting infrastructure in order that these can be fully used as an effective and efficient tool in solving various technical problems related to food and nutrient security, food safety, health care, industrial development and preservation of the environment.

- How to accelerate the **development** and **application of S&T** in the nations of the region to provide optimal solutions to the problems faced by different countries in the region in planning and implementing their national development programmes?

Through systematic and well managed programmes of training and R&D activities the RCA can be expected in the future to play a stronger role in assisting to stimulate the growth of nuclear related sciences and technologies that are necessary to solve specific technical problems in individual Member States and in the region.

The economic and scientific-technological progress that has been so far achieved in the Asia-Pacific region spans a wide spectrum of countries, ranging from least developed to technologically advanced. Considering the present socio-economic conditions of the majority of the countries in the Asia-Pacific region and the advanced level of scientific, technological and industrial progress already achieved by some of the Member States, five important areas that provide challenges and opportunities for the application of science and technology may be described as follows:

- **Food & Nutrient Security and Food Safety**

With a total population of already over 2 billion people, food & nutrient security and food safety constitute a tremendous fundamental task to solve in the Asia-Pacific region, and indeed for the whole world!

How to produce cheap and nutritious food for the mass of population constitutes a challenge that has to overcome. The range of activities for the development and application of science and technology here spans all the way from food production (plant based, animal based and artificially/chemically based), food processing and food preservation to food trade.

- **Health care**

Provision of good health care at affordable price for the mass of population, such as facilities for general health check-ups, specific diagnostic measures, therapeutic treatments, preventive services and general consultations would become another major challenge for the future, in particular considering the continuous rise in the living standard of the population.

- **Industrial development**

Industrial development in its broadest sense, namely the development of small, medium and large scale business enterprises to produce market competitive (preferably high) added value products, would give positive impacts to the economy and provide employment for the people. Included in this category are agro-based industries which can play a major role in many of the Asia-Pacific countries.

- **Nuclear Power and Safety**

Energy is the fuel of the economy! With increasing size and standard of living of the population and the growth of industries, the demand for energy in the Asia-Pacific region is expected to grow at a tremendous rate in the future.

With the rapid depletion of the finite and limited hydrocarbon resources, their potentials to be utilized for the production of higher added value products, and the environmentally detrimental effects of their burning, humanity would be forced to seek or develop other sources of energy.

In the Asia-Pacific region, Japan and Korea have adopted and implemented a consistent policy, strategy and programmes for the utilization of nuclear power as one of the supporting pillars in their efforts to meet their increasing energy demand. In this context, it would be of basic importance for the Asia-Pacific nations to think strategically on the role and impacts of nuclear power plants, of which the number is expected to increase, in the region.

As a consequence, alongside the economics and technology of nuclear power generation, the questions related to safeguards and to the safety of nuclear power plants and radiation protection become quite relevant to the whole region.

- **Environmental care**

Care for the environment is an important objective, but it is something which should not be considered in isolation. Indeed, it must be seen in the overall context of national development, as nobody would destroy or pollute his/her living environment unnecessarily.

Considering the growing awareness of the importance of environmental care, in particular realizing the local and transboundary effects of environmental pollution and degradation, individual as well as common efforts should be intensified to seek and implement the most effective and efficient policy, strategy and programmes with appropriate technologies to ensure environmental integrity.

Nuclear technologies can play a significant role as a competitive, and in some cases unique, tool to solve these problems. Planners should be well informed on the potential benefits of these technologies, and incorporate them into the overall national and regional development planning activities. As a source of regional expertise in nuclear science and technology, the RCA is placed at a strategic position to provide significant contributions towards solving problems in all of the above mentioned priority areas.

### 3. THE RCA: LOOKING INTO THE FUTURE

- **Organization and Mission:**

The RCA - Regional Co-operative Agreement - brought into force on 12 June 1972, is an intergovernmental agreement concluded under the auspices of the IAEA, in which the Government Parties undertake, *in co-operation with each other and with the IAEA to promote and co-ordinate co-operative research, development (R&D) and training projects in nuclear science and technology through their appropriate national institutions.*

Having been extended five times, each time for a period of five years, the RCA has currently 17 Member States, namely Australia, Bangladesh, China, India, Indonesia, Japan, Malaysia, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand and Vietnam.

During the past 25 years the RCA has developed into a very effective regional co-operation bringing significant benefits to its Member States, in particular to the developing ones in their effort to establish their scientific facilities, to develop their human resources, and to establish the necessary supporting infrastructures. An increasing number of those developing Member States have gradually been shifting the emphasis of their major activities from mainly capacity building towards using their acquired capabilities to solve various concrete problems in the fields of Agriculture, Health, Industry etc, which are of interest at national and regional levels. Some of the developing Member States of the RCA have even succeeded in developing their scientific and human resource capabilities to such a high level, capable of serving as Regional Resource Units (RRUs).

Indeed, it can be stated without overestimation that, the RCA mission has been well accomplished. As reported in the IAEA Technical Co-operation Report for 1995 (GOV/2858), the Joint Inspection Unit of the UN gave the RCA industrial project RAS/83/073 one of their highest ever rating for a project in the field of science and technology.

In the mean time, many of the RCA Member States have experienced rapid development, in particular in their national economies. Indeed, as mentioned earlier, the Asia-Pacific region has become a very dynamic region, exhibiting rapid growth of economic activities as well as science and technology. The interests and role of the Member States and their relations with each other and with the IAEA have consequently undergone shifts and changes, and become more complex. Similarly

the IAEA itself has also experienced significant changes in policy, strategy and programme priorities during the past 25 years.

With its Member States currently, however, still ranging from technologically advanced countries, such as Japan, Australia and New Zealand, to newly developing countries, such as Myanmar and Vietnam, and considering the fast changing world especially in the Asia-Pacific region, the RCA has in the future unusually complex and interesting challenges and opportunities in identifying, planning and implementing its programmes of activities that will address the needs and the real problems of the region and the individual countries.

- **Vision and Objectives for the next 25 years**

In the light of the aforementioned changes in the strategic environment in the next 25 years, the RCA has no choice but to review and reformulate its vision, objectives and its strategy to achieve those objectives, in order to remain highly relevant, effective, efficient and successful.

A vision of the future direction of the RCA may be stated as follows:

***VISION:** that the RCA become a respected Regional Resource Community (RRC) of nuclear science and technologically mature Member States having Regional Resource Units (RRU) located in various countries in the Asia-Pacific region, competent and competitive in the Application, Research, Development and Training (ARDT) of Nuclear Science and Technology (NS&T) geared towards solving problems of the region and of the individual Member States*

The vision foresees four major characteristics of the RCA in the future, namely:

1. **Maturity:** that the Member States of the RCA in the next 25 years reach the stage of maturity in the development of the necessary nuclear technological resources (facilities/laboratories), human resources, in particular in their own specific areas of national importance, and the supporting infrastructure including radiation protection; in addition, the Member States have already developed synergetic links and collaborations with other relevant institutions at national and international levels, and have integrated nuclear science and technology as a tool in national development;
2. **Capability:** that the RCA is recognized to have a wide spectrum of well developed **facilities**, tools and adequate number of **experts** that can provide significant contributions to the overall development of the region and the individual Member States;
3. **Capability distribution:** the Regional Resource Units, namely the facilities and experts are well distributed among the Member States, and not concentrated in a few Member States only;
4. **Scope of activities:** that the RCA has a wide range of problem solving activities corresponding to the real needs of the individual Member States and the region

In order to realize the stated vision, the RCA should develop appropriate strategies and plan of actions in an effort to achieve the following set of major objectives:

✧ **The Status**

- that the RCA achieve a respected and prominent status in the Asia-Pacific region with other prominent regional communities, such as APEC, AFTA etc.
- that the RCA can readily gain access to regional planners and decision makers
- that the RCA be regarded as an important partner to participate in regional planning and policy meetings

✧ **The Role**

- that the RCA become a major mechanism for the promotion of TCDC
- that the RCA through its programmes of activities act as an effective mechanism to promote synergetic interactions among the national nuclear research agencies, sectoral planners and end user communities at national as well as regional levels
- that the RCA become a favoured provider of services in nuclear technologies in the fields of Agriculture, Health, Industry, Energy (?), Radiation Protection and Environment for international, national and private sector organizations in the region

✧ **The Programmes**

- that the major areas of activities address the real needs and the real problems of the region and the majority of the Member States, such as to promote food security and food safety, health care, industrial development, safe and effective application of nuclear power (?), and protection of the environment
- that the programmes of activities be selected to be those of high impacts, focused on problem solving and oriented towards the benefits of the end-users. The problem solving activities shall be supported by capacity building activities in those Member States where such activities are still needed.
- that systematic measures be taken to accelerate the development of appropriate human resources, facilities and infrastructure in developing and newly developing Member States and the establishment of various Regional Resource Units (RRU) in different Member States, which shall be in a position to provide the necessary expertise, facilities and other services to cater for the needs of the region and the Member States.

✧ **The Resources**

- that the RCA has a broad spectrum of funding sources, on the basis of bilateral or multilateral arrangements
- that the RCA Member States as a group have well developed scientific-technological facilities and supporting infrastructures to support the implementation of RCA programmes
- that the RCA has a sufficiently large pool of experts to serve the needs of the region

#### ☛ The Management

- that the RCA has a core/small team of field managers headed by a senior representative (RCA President?) with an office/secretariat situated at a strategic location in the region
- that the RCA activities be determined, planned and implemented by making full use of proactive participation of the national Co-ordinators, National Project/Sub-project Co-ordinators, funding agencies and end-users
- that the RCA pay special attention to the needs of the developing and newly developing Member States to enable them to develop Regional Resource Units whenever and wherever appropriate

#### ☛ Links and Collaboration

- that the RCA has strong and mature links to and collaborations with the **IAEA** as provider and recipient of technical assistance as appropriate
- that the RCA has a strong network of links and collaborations with **end-users** in the individual Members States, in the region and worldwide
- that the RCA has an effective network of links and collaborations with **funding** and other **technical agencies** at the regional and international levels.

Having defined the above set of major objectives of the RCA activities in the future, the individual RCA Member States should obtain an accurate picture of the situation and conditions in various sectors of interest at the national level, and construct on the basis of strategic considerations the desired condition to be aimed at ("vision"), as well as the consequent major development objectives to be achieved as perceived by the responsible national planning authorities.

The nuclear technologies should be embedded into the Member States' national development planning as a potential tool to provide appropriate solutions to development problems. The Member States should decide on the best country-specific strategy to get optimal benefits from regional and international institutions and communities through bilateral or multilateral arrangements, such as the RCA. The Member States, in particular the developing and newly developing ones, should adopt a more proactive attitude in their efforts to know what they want and to find or to seek assistance in finding the best ways to get what they want!

## 4. RECOMMENDATIONS

1. The RCA Member States should reach a consensus on the "**RCA Vision**" for the next 25 years.

Suggested formulation of the RCA Vision:

**VISION:** *that the RCA become a respected Regional Resource Community (RRC) of nuclear science and technologically mature Member States having Regional Resource Units (RRU) located in various countries in the Asia-Pacific region, competent and competitive in the Application, Research, Development and Training (ARDT) of Nuclear*

*Science and Technology (NS&T) geared towards solving problems of the region and of the individual Member States*

2. The RCA Member States should reach a consensus on **the major areas of objectives for the future**

It is suggested that the RCA should seek to:

- Achieve a respected status as a major Regional Resource Community
- Play a significant role at the national and regional level
- Formulate and implement problem solving, end-user and high impact oriented programmes
- Secure strong and broadly based resources of facilities, funds and manpower
- Practise more efficient and effective management system
- Develop a wide spectrum of links and collaborations

3. The RCA Member States should reach a consensus on **the major thematic programme areas and their priorities of implementation for the future**

It is suggested that the RCA should develop thematic programmes on:

- Food & Nutrition Security and Food Safety
- Health Care
- Industrial Development
- Nuclear Power and Safety
- Environmental Care

4. The RCA Member States should develop and implement a system to **accomplish effective and efficient RCA management**

It is suggested that the aforementioned RCA management objectives and the "Working Paper for the 19th RCA WGM on the Implementation of Recommendations from the Review of the Management Structure of the RCA Programme" be used as a basis for further improvement of the RCA management.

5. The RCA should identify appropriate strategies to assist the developing and newly developing Member States to become **nuclear technologically mature**, namely to have developed strong nuclear technological resources (R&D facilities), human resources and a network of synergetic links and collaborations, particularly in their priority areas of national interest

6. The developing and newly developing RCA Member States should:

- adopt a more proactive attitude in their efforts to know what they want and to find or to seek assistance in finding the best ways to get what they want!
- integrate nuclear technology into the overall set of scientific-technological tools available in countries to solve problems

- develop synergetic national network of links and co-operations with scientific-technical and financially relevant agencies/institutes as well as with end-user groups in the country to achieve the desired output and impact.

A. Djalois,  
RCA National Co-ordinator, INDONESIA

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## **DEVELOPMENT FINANCE AND THE RCA**

### **SUMMARY**

This paper is a preliminary discussion concerning the use of the RCA framework to obtain development funds to establish capabilities, industries, technology transfer companies and consultancies employing nuclear technologies in less developed countries.

The conclusions (C1 - C10) and recommendations (R1 - R4) are as follows:

### **CONCLUSIONS:**

- C1:** The paper should be considered an initial information paper due to the limited input at this time from Member States.
- C2:** The concept of obtaining outside funding for development projects is appropriate for RCA. In particular, it is fully consistent with the agreed future direction of RCA.
- C3:** Access to development finance will require RCA and nuclear science institutes to further increase their dialogue with end-users.
- C4:** Development projects using nuclear science techniques may involve capability building, plant/facility construction, technology transfer companies or data provision.
- C5:** RCA can assist development projects through the provision of equipment, expert services and training, and through the use of TCDC. The ability of RCA to provide a "back-stopping" of local skills would add to the credibility and success rate of proposals.
- C6:** Funding arrangements may be bilateral, with the donor either an RCA or non-RCA Member State, or multilateral with funding provided by international/regional organisations or by commercial lending institutions. The levels of funding available can range from a few tens of thousands of dollars to multi-million dollar investments.
- C7:** There are several models available for the funding mechanism of development projects for both bilateral and multilateral arrangements that cover the range from small feasibility studies to major development investments.
- C8:** There is a need to consider further the issues of financial liability, intellectual property and confidentiality within the RCA context.
- C9:** Further information is required to develop a database on potential sources of

development finance in the Region.

- C10:** Mechanisms to encourage development finance specifically for LDCs have not been identified; at present the only practical schemes for RCA consideration may be those administered by agencies that are willing to consider the development of capabilities.

## **RECOMMENDATIONS**

- R1:** That National RCA Coordinators and the Agency be requested to forward to the RCA Coordinator information on potential sources of development funds (to extend the Table in the paper). Further, that National RCA Coordinators be requested to supply brief case histories of relevant, successful development projects.
- R2:** That consideration be given to engaging, at the appropriate time, the services of an expert in raising development finance within the Region.
- R3:** That a legal opinion be sought on the issues of financial liability, intellectual property and confidentiality identified in the paper.
- R4:** That RCA continue to progress towards implementation of its future management plans as an effective contribution to the ability of RCA to attract development finance.

## **1. BACKGROUND**

At the 19th Working Group Meeting of RCA, Sri Lanka raised the issue of providing assistance to Least Developed Countries (LDCs) through the raising of Development Finance from the Region within the RCA framework. The Meeting invited Japan, New Zealand, Korea, Singapore, Indonesia, India, China and the Philippines to consider the issue and to submit views to the 1997 General Conference Meeting.

On 8 July 1997 the Director, Technical Cooperation Programmes, requested New Zealand to act as a focal point for the collation of information and preparation of this paper. A timetable for input, preparation of a draft paper, comments and final paper was issued to the RCA National Coordinators of the countries named above.

Input was obtained from the Philippines and comments on the draft were received from Indonesia. Sri Lanka was invited to expand the proposal reported in the 19th WGM Report, and the comments provided were also taken into account within the draft report.

## **2. INTRODUCTION**

The number of Member States that contributed directly to this paper was limited. Individual RCA National Coordinators also have little or no experience in the raising of development finance. Therefore, the paper attempts only to provide some initial thoughts and potential

directions.

It is important first to establish that the concept of using the RCA network to obtain independent funds for regional development is appropriate. At least 3 factors suggest the concept is appropriate. These factors are:

- i) the terms of the Agreement itself, which allows appropriate international organisations to be approached by either the IAEA or a participating government;
- ii) the precedent and success of the Joint UNDP/RCA/IAEA Project for which the UNDP provided the majority of the cash financing;
- iii) the future plans of RCA as agreed following adoption of the paper on a "Review of the Management Structure of the RCA Programme".

The paper on RCA management also put forward a vision for RCA. This vision is still evolving but it seems likely that the future focus of RCA activities will include -

- a) development of the RCA as the major regional resource for research in, and applications of, nuclear science, involving a high profile with key decision makers in regional organisations;
- b) the needs of end users, and projects in partnership with end users;
- c) expanding use of TCDC and Regional Resource Units;
- d) a broad, diverse base of funding.

An RCA that operates on the basis of a - d) above as well as its fundamental principles of mutual cooperation will be well suited to obtain funds for regional development from governments, international organisations and the private sector. Therefore, the concept of obtaining outside funding for development projects is fully consistent with the future direction of RCA.

Development funds are made available to projects by many agencies within the Region. Each of these agencies has its own socio-economic goals. The development of nuclear technologies per se is unlikely to feature directly in these goals. In many situations, therefore, a development project will require a lead proposer that may be a private sector developer or a government agency that will be the ultimate beneficiary of the nuclear technology. The role of the nuclear science centres in the country undertaking the development and of the RCA will usually be as advisers, planners, implementers and operators of the project. If access to development finance is to be obtained for projects requiring nuclear science expertise, the RCA will need to continue to increase its dialogue with end users.

*C1: The paper should be considered an initial information paper due to the limited input at this time from Member States.*

*C2: The concept of obtaining outside funding for development projects is appropriate for RCA. In particular, it is fully consistent with the agreed future direction of RCA.*

*C3: Access to development finance will require RCA and nuclear science institutes to further increase their dialogue with end-users.*

### 3. TYPES OF DEVELOPMENT PROJECT

Development projects can be of many types. RCA should be encouraged to think broadly about how it can engage in the various types. Each type involves different approaches to funding and different roles for RCA. A useful classification of RCA development projects may be -

- a) capability building
- b) plant or facility construction
- c) technology transfer companies
- d) consultancy and data provision, predominantly through nuclear science
- e) consultancy and data provision, only partially through nuclear science

**3a) Capability Building .** This is perhaps the simplest type of project. The Joint UNDP/RCA/IAEA Project was an example of this type of development. It is becoming increasingly difficult to fund capability building for nuclear methods directly. Capability building is now directed more to achieving specific socio-economic outcomes. The new Joint Project is an example of this type of development funding, with nuclear techniques being further developed as part of sustainable management strategies. Other examples could be driven by a demand from the construction industry to enhance capabilities for non-destructive evaluation methods, or from the energy exploration industries (coal, oil and gas) for nuclear methods related to the dating and sourcing of geological strata.

**3b) Plant or Facility Construction.** This is perhaps the next simplest type of project. There are several industrial applications of technology that are already available for commercial development, or sufficiently well advanced to be of commercial interest. RCA activities have included sterilisation of medical products, tissue grafts, food irradiation, vulcanisation of rubber latex and treatment of flu gases. The development of such facilities in LDCs ( and developing countries generally) can improve the quality of health care, assist sustainable industrial development and provide commercial opportunities for the private sector.

**3c) Technology Transfer Companies.** Several techniques have a proven track record of assisting industrial development. Examples would be non-destructive evaluation, nucleonic control systems and some analytical methods. LDCs and developing countries would benefit from the establishment of companies that are focused on providing a mechanism for technology transfer into industry and consultancy services for industry. Such companies could be retained within nuclear science institutes or be 'spun-off' into private companies with strong links to the institutes. These companies would help to establish better quality control systems in the construction industry and improve industrial efficiency.

**3d) Consultancy and Data Provision, predominantly through nuclear science.** Many development projects proceed through stages such as proof of concept, environmental impact reporting, choice of optional methods/technologies and monitoring of operations. Examples would be harbour developments, open-cast mines, sewage treatment plants etc.. The agency providing development finance, or regulatory agencies, may require the whole development from initial concept through to an established operation to be subject to modern project management techniques. Key decision makers require data on which to base sound

management decisions. Nuclear methods such as tracer technologies and analytical methods can often provide this data. Examples would be the effects of coastal engineering works, waste or pollution impacts and optimisation of processing technologies. The management issues may require the application of a range of nuclear science techniques only, or the issues may be compartmentalised so that for a particular aspect of the problem only nuclear methods are required.

**3e) Consultancy and Data Provision, only partially through nuclear science.** Essentially as d), but decision makers may require an integrated package of data, only one part of which can be supplied by nuclear science institutes.

*C4: Development projects using nuclear science techniques may involve capability building, plant/facility construction, technology transfer companies or data provision.*

#### **4. TECHNICAL ROLES FOR RCA**

Development projects can be hindered by a lack of local expertise or facilities. Local government, funding agencies and private companies can be hesitant to act when faced with such problems, and the problems tend to be greater in LDCs.

RCA could assist technically through the provision of equipment, expert services and training for local operators or authorities. The "back-stopping" of local skills that could be offered through RCA would add credibility to the local nuclear science centres. This would increase the chance of development project proposals gaining funding support. TCDC could be used to good effect for a "back-stopping" role.

To ensure that sufficient credibility is achieved with the agencies involved in development projects, RCA must gain greater recognition by governments, international agencies and major private companies as an authoritative source of nuclear expertise within the region. This is a goal within the new management plans and vision for RCA.

A special role for RCA may be in ensuring that all aspects of the licensing and regulation of projects utilising radioisotopes, radiation and nuclear materials are dealt with effectively and do not delay the project.

*C5: RCA can assist development projects through the provision of equipment, expert services and training, and through the use of TCDC. The ability of RCA to provide a "back-stopping" of local skills would add to the credibility and success rate of proposals.*

#### **5. SOURCES OF DEVELOPMENT FUNDS**

Several sources of funds can be identified, such as

- i) bilateral arrangements, with the funder a developed country within RCA;
- ii) bilateral arrangements, with the funder a developed country outside RCA but requiring RCA involvement to provide credible local technical expertise. For both these sources the funds could come primarily from either the nuclear science

- community (via a government agency or the private sector) or from overseas development agencies in the developed country (e.g. AusAID in Australia, JICA in Japan, ADAF in New Zealand);
- iii) multilateral arrangements, where funds are sought from international or regional organisations such as UNDP, UNEP, UNIDO and ESCAP that fund developments that include technical components. These organisations usually have funds available on an on-going basis. They consider proposals, usually at set intervals, that can contribute to their overall goals in the region or recipient country. Proposals must meet strict criteria of feasibility, impact and accountability. However, although financial success may be important, a commercial rate of return is not usually sought for projects.;
  - iv) multilateral arrangements, where funds are also sought from lending institutions within the Region. An example is the Asian Development Bank. The success of project proposals to this type of institution depends to a far greater extent on commercial financial criteria.

Each of the above types of funding has different associated issues. Bilateral arrangements can be strongly influenced by the political priorities of the donor country for its development dollars. Overseas development agencies within governments in a developed country (eg., the ADAF scheme in New Zealand) often consider relatively small projects with correspondingly modest funding requirements (range perhaps US\$25,000-250,000). Such funding may be most appropriate for capability building (type 3a projects). The involvement of international organisations, particularly UN or regional organisations, appear particularly suited to projects requiring data provision for major socio-economic development programmes (types 3d and 3e above). The funding available can range from modest to quite large. They would usually be less suited to projects that establish commercial plants/facilities or technology companies (types 3b and 3c). These are usually multi-million dollar investments for which basic lending arrangements may be better suited.

*C6: Funding arrangements may be bilateral, with the donor either an RCA or non-RCA Member State, or multilateral with funding provided by international/regional organisations or by commercial lending institutions. The levels of funding available can range from a few tens of thousands of dollars to multi-million dollar investments.*

## **6. MECHANISMS FOR FUNDING**

There is nothing novel about the types of project or funding sources discussed above. However, RCA has had limited experience in this area. RCA can point to the multi-lateral UNDP/RCA/IAEA project which has moved from the initial development of human resources in nuclear science to an applications-driven project with an emphasis on end user involvement. TCDC is already a part of RCA activities and this would need further strengthening to be a major contribution to development projects.

For bilateral arrangements the terms would have to be attractive to both the donor and recipient country. Applications to overseas development agencies belonging to some regional governments often have quite simple proposal forms to be filed jointly by institutions in the donor and recipient countries. This would apply to a joint proposal to build a capability in a

nuclear technique. For larger scale projects such as type 3b and 3c (plants/facilities or technology companies) the funding mechanism would not be so simple. The project could be on the basis of a turnkey project, or on a Build-Operate-Transfer or Build-Operate-Own basis. The extent of donor participation, financial interest and guarantees would be negotiable.

In multilateral arrangements the goals and financial requirements of the third party partner must be complied with. However, many regional and international organisations may not require the pay-back of their investment. Lending institutions normally do require eventual pay back of their investment.

When a private sector company is involved it is again common for the company to be provided with government loan facilities and incentives subject to successful commercialisation such as low interest rates, tax incentives or other concessions.

## **6.1 ASIAN DEVELOPMENT BANK (ADB)**

ADB is taken as one major example of a lending institution in the Region. It assists the advancement of Developing Member Countries (DMCs) through loans and equity investment, by providing technical assistance, by catalysing public and private investment capital, and through support for other development activities.

The ADB's spectrum of activities is wide within its broad objectives of promotion of economic growth, reduction of poverty, improvement of the status of women, development of human resources and sound management of natural resources and the environment. Loans can be made to DMCs at different levels of development through different funds (Ordinary Capital Resources or Asian Development Funds). Development of the private sector is encouraged, and loans to this sector can be direct and without government guarantee. The concepts of build-operate-own and build-operate-transfer are encouraged. ADB co-finances with developed member countries and with UN organisations.

Since ADB may support the provision of technical advice and employ consultants, there would appear to be opportunities for RCA. However, many ADB projects are such major development projects that they might stretch the resources of RCA alone.

*C7: There are several models available for the funding mechanism of development projects for both bilateral and multilateral arrangements that cover the range from small feasibility studies to major development investments.*

## **7. LIABILITY, INTELLECTUAL PROPERTY AND CONFIDENTIALITY**

If RCA is to become involved in development funding arrangements, then several related issues must be considered. When private sector businesses or lending institutions are involved, three important issues are liability, intellectual property (IP) and confidentiality.

RCA is governed by the terms of its constituting Agreement. A legal opinion should be consulted. However RCA is an inter-governmental agreement concerned with mutual

cooperation in research, development and training related to nuclear science and technology in national institutes. The wisdom and ability of RCA to undertake projects that could carry financial liabilities is questionable. Suppose RCA were to enter a contractual arrangement to deliver some component of a project, and was deemed to have failed or been negligent in its undertaking? What would be the position? RCA could seek protection from liability issues, but to some extent this will detract from its status as an expert body in the eyes of commercial third parties.

Intellectual property issues can be dealt with on a case-by-case basis and may not be a serious issue for many likely projects. For example, no new invention is required or likely for a radiation sterilisation plant. Consultancy information provided to government regulatory agencies may be in the public domain. However, there is clearly a potential for the discovery of valuable new information. Common practice could dictate that existing IP was retained by the party owning it before commencement of the project. IP discovered during a project could be made the subject of negotiation, possibly based on some division according to the equity put into the project. However, the status of RCA, its Agreement and mechanisms to deal with IP must be considered.

Even if IP is not an issue, confidentiality may be. Information gained during a project may be commercially or even politically sensitive. There are examples where governments and their agencies protect the commercial secrets of private companies in order to stimulate development. However, RCA is based on mutual sharing of information and confidentiality is another issue for further consideration.

*C8: There is a need to consider further the issues of financial liability, intellectual property and confidentiality within the RCA context.*

## **8. FURTHER INFORMATION REQUIRED**

There are many sources of development finance available for projects within the Region. A useful step would be to obtain as complete a list of potential sources as possible. The listing should, where possible, provide information on the agency involved, contact details, criteria for advancing funding and application deadlines. A partial list is given in the Table to initiate the development of this database.

Brief case histories of development projects in the region would also be useful. These may be related to nuclear technology, but the principles of the funding issues may also be obtained from the more numerous examples of non-nuclear projects.

This further information can be obtained in several ways. The IAEA, as a UN body, will have considerable information to hand. Individual RCA Member States could also be surveyed and requested to add to the Table and provide case histories. However it may be necessary to engage the services of an expert in regional development finance if progress is to be made in the near future. Such an expert could also make an independent evaluation of the ways in which RCA could attract development finance.

*C9: Further information is required to develop a database on potential sources of development finance in the Region.*

## **9. CONSIDERATION OF LDCs**

This paper was initiated to consider development finance for LDCs. However the approach and issues raised in the paper, in fact, apply to any developing RCA Member State. LDCs may receive special consideration by some potential funders (e.g. UNDP) while bilateral arrangements will tend to be influenced by political relationships. The paper has not identified any way in which development finance specifically for LDCs could be encouraged. Indeed, some of the types of project identified might well be suited to more advanced developing countries.

Any development project that involves considerable sums of money will inevitably require considerable experience in evaluating and submitting proposals and in project management. Successful applications to major sources of development finance such as the ADB also require considerable experience, including experience in the marketing of proposals. There is no reason why RCA cannot gain the necessary experience but Member States, and particularly LDCs, may not have sufficient experience at present. If so, then the only immediate source of development funding may be through schemes which are willing to consider the establishment of better capabilities and resources (type 3a projects).

Government overseas development agencies may provide such assistance (eg., through ADAF in New Zealand). However, their disadvantages may include the funding for individual projects and total overall funding being limited; competition for funding may be intense. Although funding requests may be modest, applications may still have to meet criteria such as a demonstration of co-funding, of downstream benefits to the business growth of the donor country or of favoured country status.

*C10: Mechanisms to encourage development finance specifically for LDCs have not been identified; at present the only practical schemes for RCA consideration may be those administered by agencies that are willing to consider the development of capabilities.*

## **10. OVERALL CONCLUSIONS**

The concept of seeking development funds, particularly for LDCs, is consistent with the agreed future directions of RCA. RCA can play a role in securing development finance through technical "back-stopping" of the local nuclear science resources. RCA can offer equipment, expert services and training, and utilise TCDC in this "back-stopping".

Several types of project have been identified, ranging from the establishment of capabilities and facilities, to supporting technology transfer companies and the provision of project management information. Bilateral and multilateral funding mechanisms are available, including access to the funds of international or regional organisations, such as UN agencies, and of commercial lending institutions.

Issues that require further discussion include financial liability, intellectual property and confidentiality. More information is needed on the organisations and institutions that are

potential sources of development finance.

## **11. RECOMMENDATIONS**

- R1:** That National RCA Coordinators and the Agency be requested to forward to the RCA Coordinator information on potential sources of development funds (to extend the Table in the paper). Further, that National RCA Coordinators be requested to supply brief case histories of relevant, successful development projects.
- R2:** That consideration be given to engaging, at the appropriate time, the services of an expert in raising development finance within the Region.
- R3:** That a legal opinion be sought on the issues of financial liability, intellectual property and confidentiality identified in the paper.
- R4:** That RCA continue to progress towards implementation of its future management plans as an effective contribution to the ability of RCA to attract development finance.

Table: Sample of informational database

| AGENCY                                 | SPECIFIC FUND  | CONTACT   | APPLICATION DATES | CRITERIA  | NOTES  |
|--|--|---|-------------------|---|--|
| NZ Ministry of Foreign Affairs & Trade | Asia Development Assistance Facility (ADAF)            | ADAF<br>Ministry of Foreign Affairs & Trade<br>PO Box 18901<br>Wellington<br>Tel: (64-4) 494 8500<br>Fax: (64-4) 472 9596           | 3 times per year  | Joint Ventures between NZ businesses and institutes and the recipient country                           | Usually up to about US\$75,000   |
| ASIA 2000                              | Collaborative Research Project                         | Prog. Manager(Business)<br>ASIA 2000 Foundation<br>PO Box 10144<br>Wellington<br>Tel: (64-4) 471 2320<br>Fax: (64-4) 471 2330       | August, April     | All Science fields; collaborative research relevant to NZ's business interests or economic ties in Asia | Usually small grants   |
| ADB                                    | Ordinary Capital Resources;<br>Asian Development Funds | ADB<br>PO BOX 789<br>0980 METRO MANILA, PHILIPPINES.<br>Tel: (63-2)-632-4444<br>Fax: (63-2)-636-2444                                |                   | See section 6.1   | Usually major ventures, but small consultancies and expert services are often required |
| UNDP                                   |  | Regional Bureau, Asia and Pacific<br>UNDP<br>One United Nations Plaza<br>New York<br>Tel: (1-212) 906 5000<br>Fax: (1-212) 826 2057 |                   | Set by goals for inter-country cycle  |  |

Other Agencies include: World Bank, UNEP, UNIDO, AusAID, ESCAP, ASEAN.

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## **REGIONAL REPRESENTATION FOR THE RCA PROGRAMME**

The RCA Working Group Meeting held in Myanmar in March 1997 considered and endorsed 11 of the 12 recommendations in the "Report of the Working Group Meeting to Review the Management Structure of the RCA Programme and Develop Proposals for the Future" to take immediate effect as policy objectives within the RCA Programme. Recommendation 11 in the Working Group Report was that *to facilitate the RCA achieving the vision statement outlined in the Working Group 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. 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.*

The Working Group meeting in Myanmar agreed that the above Recommendation should be separately examined with the view to submitting a report on the issue to the RCA General Conference Meeting on 1 October 1997. This paper constitutes such a report for discussion.

### **PROPOSAL**

A senior RCA representative be stationed in a major regional centre with a target date of January 2000 to carry out the roles defined below.

### **ROLES OF REGIONAL REPRESENTATIVE**

As has been proposed in the RCA Management paper, the long term vision of the RCA programme is seen to encompass an expanded programme with support coming from a wider group of organisations than at present. This expansion will bring increasing complexity and intensity to the overall coordination and management needs of the RCA programme. It is seen that the regional representative would take on these responsibilities and implement the decisions of the RCA Member States.

Beyond the above role, the additional tasks of the regional representative based on the vision for the RCA as in the above Working Group Report would be:

- to provide a strategic high level representation and presence for the RCA in the region, additional to the ongoing representation in Vienna;
- to facilitate the RCA becoming a known, visible and respected part of the region's science and technology community;
- to have a strong network of contacts with planners and decision makers in the regional community at the formal and the informal levels;
- 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;
- to enhance funding opportunities for the RCA from potential donor organisations as a result of outlining project frameworks as to provide technical and policy guidance (unfortunately

- this strategy will be unlikely to give results in the short term, because of the long lead time required to fit into the donors' funding cycles, which are typically three to five years); and
- to encourage additional TCDC opportunities which could factored into new RCA projects.

## **ISSUES FOR DISCUSSION**

### **(1) The relative functions of a future regional representative and the present RCA Office, and the relationship between these positions.**

There are a number of issues to be resolved to enable a regional RCA representative to achieve the above roles. For instance, the regional representative will need to have a recognised status to facilitate the necessary high level contacts to take place readily. This could be most easily achieved if the position was to have a senior UN classification and be part of the staff of a UN Agency. The setting of the post as a UN position would be a positive demonstration that the person occupying the position was a regional representative and not representing his/her own country. Being part of the UN system and being able to make full use of the UN network would be an essential element to enable the small regional office to operate with the necessary degree of efficiency and effectiveness. There will also need to be coordination arrangements established between the regional representative and the RCA Office in Vienna once the final responsibilities of both positions are agreed.

### **(2) Funding**

The annual funding arrangements have yet to be determined since these are inextricably linked with how the position might be accommodated. However, the salary required to support the new position is estimated to be around US\$100,000.

The post should logically be within the IAEA structure. However it is not clear at this stage how this could be achieved. There are several options for funding the regional position including full funding by the IAEA, part funding by the Agency with RCA Member States providing supplementary funds, or from RCA funds. The appointment of a Chief Technical Officer within the new RCA/IAEA/UNDP project over the next three years would represent a positive step towards the appointment of a regional representative around the turn of the century.

### **(3) Location**

The location for the senior RCA representative should be in an RCA Member State and preferably one where there is access to major potential donors such as Bangkok (with access to ESCAP), Manila (with access to ADB) or Jakarta (with access to ASEAN).

John Rolland  
National RCA Coordinator for Australia

September 1997



REGIONAL CO-OPERATIVE AGREEMENT  
INTERNATIONAL ATOMIC ENERGY AGENCY



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**GUIDELINES AND OPERATING RULES  
FOR THE RCA PROGRAMME**

**October 1997**

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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. **The text of the Agreement provides the fundamental framework and guidance for regional co-operation. It is the source document for any guidelines, operating rules and procedures needed to govern regional co-operation.**

### **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 **maximize** 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 roles 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, **in accordance with an agreed format (Section 3.2)**, 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 **take** decisions in connection with the implementation of the Agreement - **is the principal point of contact for RCA activities in his/her Member State. He/she** 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 **and close co-ordination** 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 participation of his/her country **nominees** in RCA **activities** 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 **on behalf of his/her government**:

- (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) Pursuant to Article II of the RCA Agreement, the National RCA Representatives shall hold at least two meetings a year:

- **A regular meeting - the National RCA Representatives Regular Meeting - usually in March/April**, at venues in the region, as agreed upon by the Parties;
- **A General Conference meeting - the National RCA Representatives General Conference Meeting - at the time of the IAEA General Conference**, usually in September.

- (b) At the **Regular Meeting**, National RCA Representatives shall:

- Consider the annual report prepared by the Agency's RCA Programme Co-ordinator (Section 3.2.c);
- Review the overall implementation of the RCA programme and make appropriate recommendations for improving its effectiveness and efficiency;
- **Examine and approve** new project proposals;
- **Approve the** programme of activities and establish priorities;
- Examine and propose follow-up actions on conclusions and recommendations of Project Committee Meetings;

- Consider policy issues, overall management and planning, including development and co-ordination of funding strategies;
- (c) **At the General Conference Meeting the National RCA Representatives shall:**
- **Approve the RCA annual report as modified by the Regular Meeting;**
  - **Take decisions on issues outstanding from the Regular Meeting or referred to it by the Regular Meeting;**
  - Consider any other matters related to **the implementation 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 **Regular 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 **in consultation with Member States** 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, **with the prior approval of participating Member States**, 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 **appropriate rules where applicable**. 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 (Section 2.2.d);
  - 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 Project Technical Officer and 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 **National RCA Representatives Regular Meeting**;
- (g) Appoint, in accordance with its staff rules and regulations, a staff member to be the RCA Programme Co-ordinator;
- (h) Appoint **as appropriate** staff members from its technical divisions to **assist the** different project committees.

### 3.2. THE AGENCY'S RCA PROGRAMME CO-ORDINATOR

The Agency's RCA Programme Co-ordinator 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 (Section 2.2.d), 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 **their Regular 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 **in accordance with an agreed format; and**
  - Part 3: A report from each Member State on each of the projects in which they have participated, **in accordance with an agreed format.**
- (d) Seek, in **consultation with the** RCA Member States, Agency senior management, governments and international organizations, financial support for the **approved** 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 **where applicable** 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 programmes, in particular the Agency's technical co-operation **programme** in the East Asia and Pacific regions, **and the Regional Agreement programmes for Africa and Latin America (AFRA and ARCAL)**;
- (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 **projects** 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 **their Regular 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 **Regular 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 **in the project** (the National RCA Project Co-ordinator) and **whenever appropriate** one representative from the Agency. They may be accompanied by advisers and experts at meetings of the Project Committee. **All Project Committees in the same thematic area shall meet at the same time and location.**
- (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 (**chronology of activities and respective annual disbursements**);
  - 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. **Under certain circumstances, independent evaluations may be requested.**
- (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 **shall be** chaired by the Representative of the RCA Member State hosting the meeting.
- (h) The Representative of the Agency will perform 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 **National 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 in the CRP and **whenever appropriate** 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 or 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.
- (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 **more advanced countries in the region**. 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 agreed 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. **It should be borne in mind that 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 thematic approaches 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 **regional as well as** 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.

## **TCDC<sup>1</sup> IN THE RCA PROGRAMME:**

### **PAST ACTIVITIES, CURRENT STATUS, AND FUTURE PROSPECTS**

1. INTRODUCTION
2. PAST ACTIVITIES & CURRENT STATUS OF TCDC
  - 2.1. RCA Funding
  - 2.2. RCA Projects
  - 2.3. RCA Training Courses
  - 2.4. RCA Management Meeting
  - 2.5. Expert Assignment
  - 2.6. RCA Project Fellows
  - 2.7. Specific Projects
3. OTHER PROGRAMMES COMPLIMENTING TCDC
4. FUTURE PROSPECTS
5. CONCLUSION

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#### **<sup>1</sup> General Criteria Used By the United Nations For Determining TCDC Activity**

*To qualify as a Technical Co-operation Among Developing Countries (TCDC) activity, the first essential requirement is that the activity or project involves the sharing of developing countries' own expertise, facilities and other capacities with one another. It is not TCDC if primarily dependent on technical inputs or expertise provided by a developed country. A TCDC activity may, however, utilise whenever necessary, advice, technical support and finance from external sources, an institution or private sector enterprises. Such support, however, should constitute only a catalytic or complementary input.*

*Secondly, the activity should be managed and implemented by the participating developing countries or their institutions. If a UN Organisation serves as an Executing Agency, it is not categorised as a project applying TCDC. This requirement applies also to activities which constitute a component of a project, i.e., to qualify as a TCDC modality, the particular component of the project must be implemented through TCDC even though the project as a whole is not. Fellowships fully funded from external sources are not TCDC activities unless implemented by a developing country institution.*

*Inter-country projects funded from UNDP regional, interregional and global Inter-country Project Funds (IPFs) qualify as TCDC activities only if they (a) are executed by developing country institutions, inter-governmental organisations, and regional institutes with developing countries as members, and (b) involve the sharing of participating countries' expertise, facilities, etc.*

## **1.0 INTRODUCTION**

The Regional Co-operative Agreement for Research, Development and Training (RCA), is an intergovernmental agreement which came into force on 12 June 1972. Due to its continuing success it had been extended five times; each for a period of five years, with the latest extension being on 12 June 1997. At this 25<sup>th</sup> anniversary of the RCA, there are now 17 countries that are parties to the Agreement, viz. Australia, Bangladesh, China, India, Indonesia, Japan, Malaysia, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand and Vietnam.

The 17 RCA Member States represent a wide diversity in socio-economic status as well as in the direction and degree of advancement of national nuclear technology and nuclear power programmes. These differences do not weaken or render the RCA ineffective, but it is in fact acknowledged that these differences were actually one of the factors that contribute to its continuing existence. These differences also provide opportunities for lead roles in specific areas to be spread among Member States; thus optimising human resource utilisation leading to the development of expertise and infrastructures in the niche technical or core competency areas.

The principle of TCDC which features quite prominently in the RCA was implementable due to in part by the varying degrees of technical expertise in the Member States. This principle is well articulated in Article 1 of the Agreement 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". TCDC is an important component of the Agreement that brings Member States together with the common purpose of prospering together through partnership and co-operation. In fact, the RCA network of co-operating Member States was described as a model for TCDC. The Joint Inspection Unit (JIU), an independent investigatory body of the UN, in evaluating the UNDP/IAEA/RCA Industrial Project gave this project the highest rating among the ten UNDP-Funded Asia and Pacific regional projects selected for inspection.

In recognition of the role of TCDC in the RCA, the 19<sup>th</sup> RCA Working Group Meeting in Myanmar, 10-14 March 1997, agreed to the proposal that a TCDC Contact Point be established to assess TCDC's contribution and compile TCDC activities within the RCA. For that purpose, Malaysia was nominated as the TCDC Contact Point and this paper is presented as a report.

## **2.0 PAST ACTIVITIES AND CURRENT STATUS**

TCDC could be seen to permeate all aspects of RCA activities, viz. Funding, Project Implementation, Training Courses, Management Meetings, Expert Assignments, Project Fellow Attachments, Specific Projects, and other programmes complementing TCDC.

### **2.1 RCA Funding**

### 2.1.1 Cash Contribution

Over the period of 1980 to 1996, the total fund available in the RCA was approximately US\$ 29 million. **Table 1** shows that more than 25% of this total came from the Member States and **Table 2** indicates that Japan and Australia were the two major cash contributors to the Programme and with Korea and China leading among the developing RCA Member States.

*Table 1: Fund available in the RCA Programme: 1980-1996*

| <b>Fund Source</b> | <b>Amount (US\$)</b> | <b>% Total</b> |
|--------------------|----------------------|----------------|
| UNDP               | 11,719,504.00        | 40.4           |
| IAEA               | 9,318,598.29         | 32.1           |
| Member States      | 7,525,041.88         | 26.0           |
| Other (USA & ADB)  | 444,893.36           | 1.5            |
| <b>Total</b>       | <b>29,008,037.53</b> | <b>100</b>     |

*Table 2: Cash contribution from Member States: 1980 – 1996*

| <b>Member State</b> | <b>Amount (US\$)</b> | <b>% Total</b> |
|---------------------|----------------------|----------------|
| Japan               | 4,456,830.21         | 59.2           |
| Australia           | 2,641,947.68         | 35.1           |
| Republic of Korea   | 141,800.00           | 1.9            |
| China               | 100,097.28           | 1.3            |
| New Zealand         | 60,441.17            | 0.8            |
| Indonesia           | 50,000.00            | 0.7            |
| Malaysia            | 40,000.00            | 0.5            |
| Thailand            | 20,000.00            | 0.3            |
| Philippines         | 13,925.54            | 0.2            |
| <b>Total</b>        | <b>7,525,041.88</b>  | <b>100</b>     |

### 2.1.2 In-kind Contribution

Most of the RCA Member States had made in-kind contributions in the forms of hosting training courses, meetings, and also in the providing of local experts and training facilities. Since 1989, India, Republic of Korea and China had provided funds and resources to conduct regional training courses in their countries as in-kind contributions to RCA in the form of TCDC. **Figure 1** shows that only 81% of the total regional training courses (RTCs) could be defined as TCDC for the period of 1980 - 1996. The number of RTCs held annually peaked in 1989/1990, further declined but remained constant from 1992 onwards (**Figure 2**).

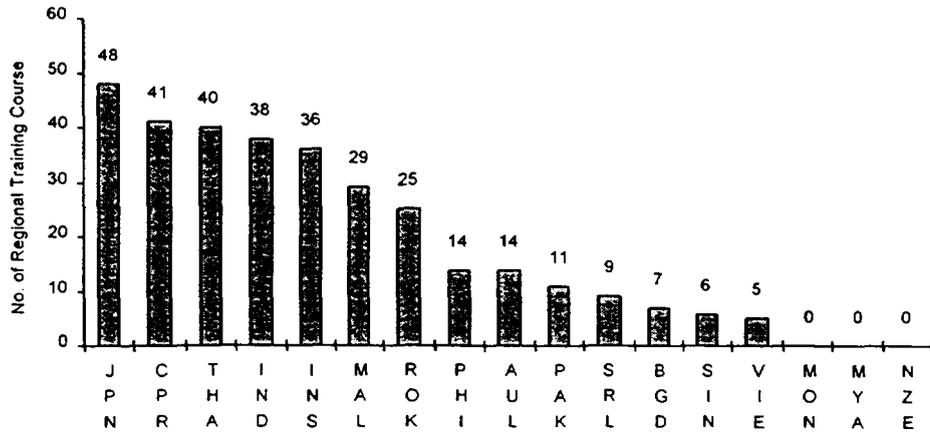


Figure 1: Distribution of Regional Training Courses Hosted by RCA Member States (1980 – 1996)

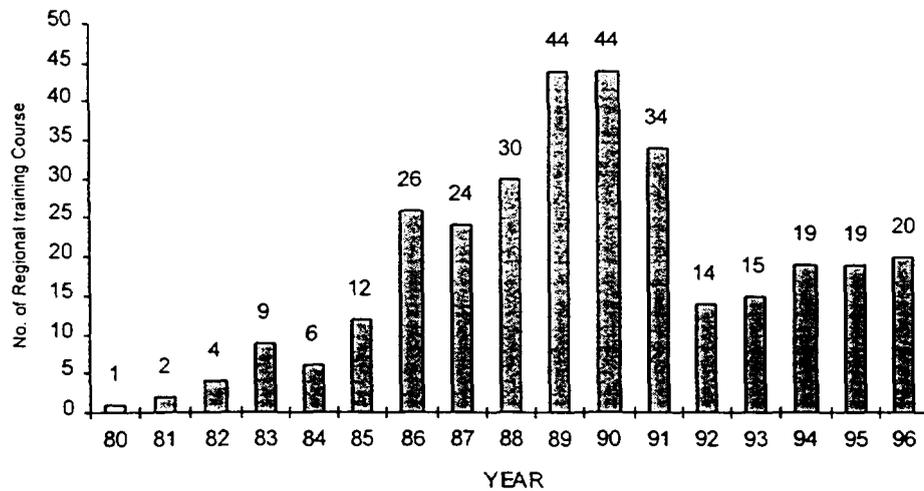


Figure 2: Distribution of Regional training Course by Year (1980 – 1996)

In addition, the governments of Indonesia, Malaysia and Thailand contributed to the RCA by providing cost-free facilities and logistical support for the Chief Technical Officer and the Long-term Expert for Tracers and Non-Destructive Evaluation provided under the Joint UNDP/RCA Industrial Project.

## 2.2. RCA Projects

For the period between 1982 - 1995, 31 IAEA/RCA projects and 5 IAEA/RCA/UNDP projects were implemented in the RCA programme. All the projects were relevant and addressed real problems and needs of the Member States. Of the 36 projects tabulated

in Table 3, 12 were in industry, 12 in energy and nuclear power, 8 in medicine and biology, 3 in agriculture and 1 in the area of radiation protection.

*Table 3: Projects implemented by the IAEA as part of the Asian Regional Co-operative Agreement: 1982 - 1996*

| <b>IAEA/RCA Projects</b>      |   |
|-------------------------------|---|
| RAS/8/011                     | Radioisotopes in Industry   |
| RAS/6/006                     | TC on Brachytherapy of the Uterus Cancer                                  |
| RAS/1/006                     | Regional Workshop on NAA  |
| RAS/1/007                     | TC on Use of Reactor Neutron Beam   |
| RAS/6/011                     | Radioimmunoassay of Thyroid Hormones                                      |
| RAS/6/012                     | TC on Radioimmunoassay and its Clinical Applications                      |
| RAS/0/012                     | Regional WASP Users Workshop  |
| RAS/6/010                     | Train-the-trainers on Data Processing in Radioimmunoassay                 |
| RAS/8/059                     | Isotope Hydrology Workshop and Seminar Support                            |
| RAS/8/062                     | Radioisotopes in Industry   |
| RAS/8/063                     | TC on Advanced Methodologies of Isotope Applications                      |
| RAS/9/006                     | Strengthening of Radiation Protection Infrastructures                     |
| RAS/0/013                     | Energy and Nuclear Power Planning   |
| RAS/4/008                     | Nuclear Instrument Maintenance  |
| RAS/6/016                     | Use of Computers in Technetium-99m Imaging                                |
| RAS/7/003                     | Radiation Sterilisation of Tissue Grafts                                  |
| RAS/8/064                     | Radiation and Isotope Application in Industry                             |
| RAS/0/015                     | Development of TCDC in Asia and Pacific                                   |
| RAS/8/065                     | Marine Contaminant and Sediment Transport                                 |
| RAS/4/011                     | Research Reactor Utilisation  |
| RAS/5/022                     | Control of Tropical Plant Viruses   |
| RAS/6/018                     | Radioimmunoassay for Hepatitis B Diagnosis                                |
| RAS/0/019                     | Nuclear Information System  |
| RAS/6/022                     | Strengthening Nuclear Medicine in RCA Member States                       |
| RAS/8/068                     | Isotopes and Radiation in Industry and the Environment                    |
| RAS/8/069                     | Isotopes and Radiation in Industry and the Environment                    |
| RAS/8/070                     | Isotopes and Radiation in Industry and the Environment                    |
| RAS/0/021                     | Nuclear Power Planning  |
| RAS/0/022                     | Public Acceptance and Trade in Irradiated Food                            |
| RAS/0/023                     | Energy, Electricity and Nuclear Power Planning                            |
| RAS/0/073                     | Measurement of Marine Contamination & Transport phenomena                 |
| <b>Sub-total</b>              | <b>31 projects</b>  |
| <b>IAEA/RCA/UNDP Projects</b> |   |
| RAS/8/008                     | Industrial Application of Isotopes and Radiation Technology               |
| RAS/8/061                     | Industrial Application of Isotopes and Radiation Technology               |
| RAS/5/020                     | Food Irradiation Process Control and Acceptance                           |
| RAS/5/021                     | Increasing the Capabilities of Common Grain Legumes                       |
| RAS/8/071                     | Isotopes and Radiation Technology and Environment Sustainable Development |
| <b>Sub-total</b>              | <b>5 projects</b>   |
| <b>Total</b>                  | <b>36 projects</b>  |

### 2.3 Participation in the RCA Training Courses

Regional Training Courses remained an important component of the RCA activities. In the period of 1980 - 1996, a total of 3,191 participants were trained in various fields of nuclear science and technology. **Figure 3** denotes that participants from developing Member States constituted almost 100% of the course trainees.

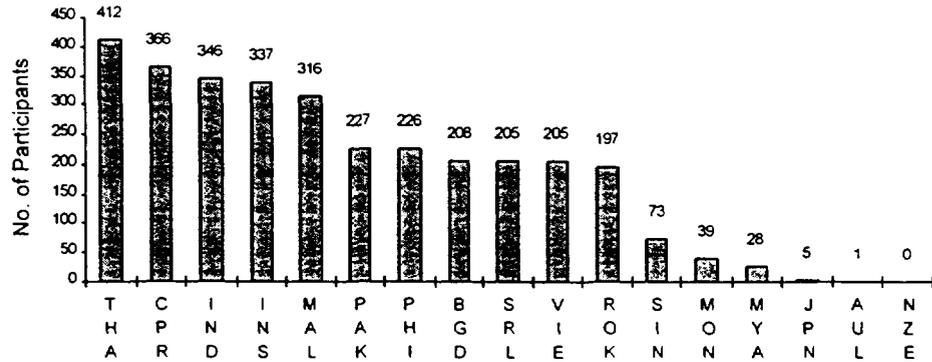


Figure 3: Participation in the RCA Training Courses by Member States (1980 - 1996)

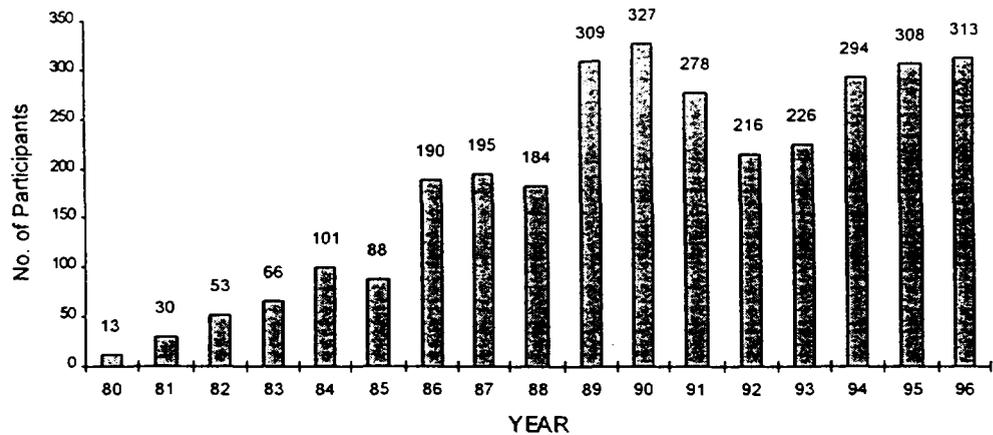


Figure 4: Participation in the RCA Training Courses by Year: 1980 - 1996

In **Figure 4**, participation in the RTCs held per year was noted to have escalated significantly from 1980 to 1990 but subsequently remained close to constant up till 1996 even though the number of training courses held per year began to decrease (see **Figure 2**). It may be implied that the RCA programme had succeeded into focusing to fewer courses but with increased participation. Thus, it was assured that the Member States would achieve a certain critical mass of project personnel having a reasonably level of skill and expertise to sustain the implementation of the identified projects.

## 2.4 Hosting and Participation in the RCA Management Meeting

All the National RCA Co-ordinators meet twice a year at the RCA Working Group Meeting (WGM) and RCA General Conference Meeting (GCM). Participation of representatives at both these meetings were fully funded by the governments of Member States. The Member States also hosted the WGM alternately (Table 4) and for the developing Member States, this is a form of in-kind contribution that could be categorised as a TCDC activity.

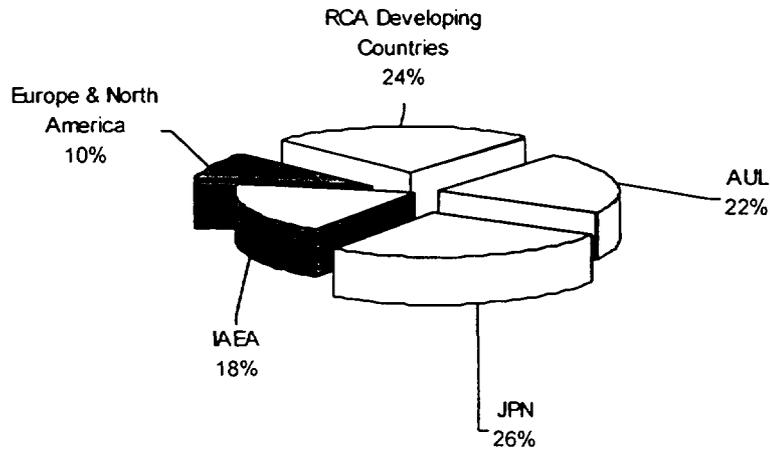
*Table 4: Hosting of RCA Working Group Meetings (1979 – 1997)*

|         |   |
|---------|---|
| 1st. :  | Tokyo, Japan, 15 – 19 October 1979              |
| 2nd. :  | Manila, Philippines, 27 March - 1 April 1980    |
| 3rd. :  | Jakarta, Indonesia, 21 - 27 May 1981            |
| 4th. :  | Kuala Lumpur, Malaysia, 16 - 21 June 1982       |
| 5th. :  | Dhaka, Bangladesh, 11 – 16 May 1983             |
| 6th. :  | Kalpakkam, India, 20 - 23 March 1984            |
| 7th. :  | Lahore, Pakistan, 25 - 28 March 1985            |
| 8th. :  | Seoul, Republic of Korea, 25 April - 2 May 1986 |
| 9th. :  | Colombo, Sri Lanka, 32 – 26 March 1987          |
| 10th. : | Beijing, China, 11 – 14 April 1988              |
| 11th. : | Sydney, Australia, 13 – 16 March 1989           |
| 12th. : | Chiang Mai, Thailand, 19 - 22 March 1990        |
| 13th. : | Ho Chi Minh City, Vietnam, 4 - 7 March 1991     |
| 14th. : | Tokyo, Japan, 24 – 28 March 1992                |
| 15th. : | Manila, Philippines, 16 – 19 March 1993         |
| 16th. : | Bali, Indonesia, 22 – 25 March 1994             |
| 17th. : | Kuala Lumpur, Malaysia, 27 - 30 March 1995      |
| 18th. : | Beijing, China, 20 – 24 May 1996                |
| 19th. : | Yangon, Myanmar, 10 – 14 March 1997             |

## 2.5 Expert Assignments

Expert assistance among Member States was initiated in 1982 i.e. at the beginning of the Joint UNDP/RCA/IAEA project. Figure 5 shows that for the period of 1986 - 1991 (data from 1992 onwards were not available), only 24% of expert assignments to regional and national training events were drawn from developing countries. This low percentage of experts resourced from RCA developing countries reflects the apparent absence of such expertise. It also mirrors, the growing need of Member States to acquire more sophisticated or specific technologies which were still not readily available within the developing Member States of the region. Consequently, in some cases project activities were exclusively reliant on experts from Europe and North America.

Figure 5 : Expert Assignment Under the joint UNDP/RCA/IAEA Project:  
1986 - 1991



### 2.6 Training of RCA Project Fellows

In addition to expert assignment to assist in the implementation of the projects, human resource development was also an important factor. Since 1980, 33 fellows were trained in the region in the field of industrial and radioisotope application under the Joint RCA/UNDP/IAEA Project. Although data from 1992 onwards were not available, **Figure 6** displays the trend that about 30% of the fellowships could be considered as TCDC activities. Figure 7 indicates that 91% of the said fellowships were implemented in 1985 - 1991.

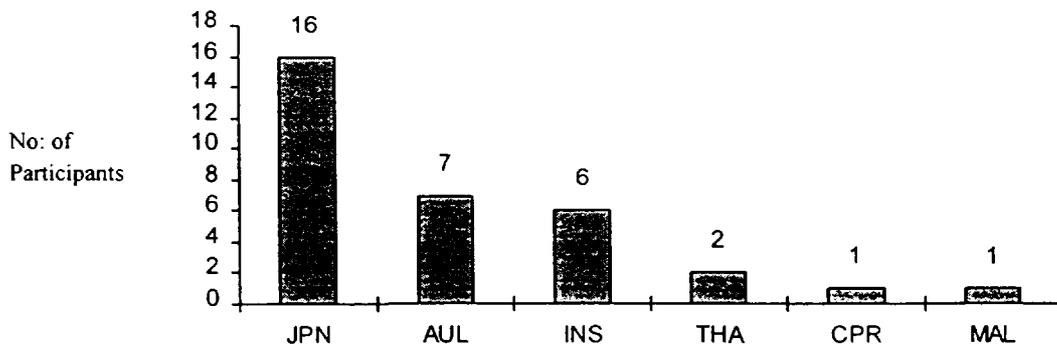


Figure 6 : Distribution of Fellows Trained Under RCA Programme in the Region by Host Country (1980 - 1991)

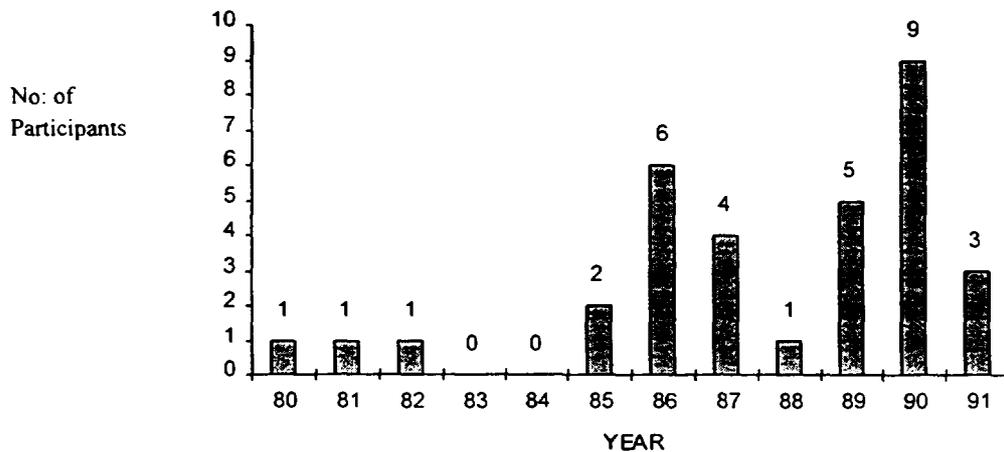


Figure 7 : Distribution Fellows Trained under RCA Programme in the Region by Year (1980 – 1991)

## 2.7 TCDC in Specific Projects

### 2.7.1 Radioimmunoassay of Thyroid

Pakistan, Republic of Korea and Thailand were designated as resource centres and were responsible for the distribution of kits, monitoring inter-laboratory quality assurance programmes and also providing expertise to the region.

### 2.7.2 Radiation Sterilisation of Tissue Grafts

Malaysia and Indonesia extended emergency assistance to the Philippines Tissue Bank by dispatching sterilised tissue grafts to overcome its shortage for the treatment of burn victims of an unfortunate fire tragedy near Manila.

### 2.7.3 Radioimmunoassay for Hepatitis B Diagnosis

China provided bulk reagents to enable the region to locally produce diagnostic kits for hepatitis B assay. Pakistan, Republic of Korea and Thailand have donated resources to assist in the development of quality systems and the monitoring of the quality of starting materials.

### 2.7.4 Industrial Application of Isotopes and Radiation Technology

- Tracer Technology

China provided assistance to the Ceylon Petroleum Plant at Sri Lanka for leak testing of pipelines in the oil industry. Malaysia provided experts to assist Philippines in studies of waste pond dynamics and Republic of Korea provided equipment and expert assistance to Mongolia to enable to undertake laboratory scale studies of flow behaviour under a variety of regimes and to gain experience in the interpretation of flow results. Thailand too, had provided a field site venue for experts from Indonesia and Malaysia to experience and participate in flow rate experiments conducted on-site in a large commercial gas pipeline.

- **Radiation Technology**  
Indonesia provided irradiation facilities to enable irradiation of tonne quantities of natural rubber latex to be irradiated and supplied to Sri Lanka and Vietnam.

**2.7.5 Radiation Protection**

India provided a TLD system to assist Sri Lanka and this had improved radiation monitoring capabilities in Sri Lanka.

**2.7.6 Nuclear Power Development**

India and Pakistan provided expert assistance at a National Workshop on Nuclear Power Planning held in Sri Lanka.

**3.0 OTHER PROGRAMMES COMPLIMENTING TCDC IN THE RCA PROGRAMME**

Most of the participating countries in the RCA programme were also actively participating in various multilateral and bilateral arrangements outside the IAEA or RCA framework.

**3.1 Bilateral Technical Co-operation outside IAEA**

Several examples of bilateral co-operation through Memoranda of Understanding (MOUs) are listed in **Table 5**.

*Table 5 : Examples of Bilateral MOUs in the RCA*

| <b>Memoranda of Understanding (MOUs)</b> | <b>Areas of Co-operation</b>   |
|--|--|
| KINS and JAPEIC                          | Inspection Technology and Welding Inspection for Nuclear Facilities                |
| KINS and NUPEC                           | Nuclear Safety Analysis  |
| KINS and JCAC                            | Environmental Radiation Measurements   |
| KINS and NNSA                            | Nuclear Safety   |
| KINS and CIRP                            | Nuclear Safety and Radiation Protection  |
| Malaysia and Australia                   | Nuclear Medicine, Radiation Protection and Safety, Industry and Isotope Production |
| MINT and JAERI                           | Treatment of oil-palm wastes for animal feeds                                      |
| MINT and JICA                            | Establishment of the Technology of Radiation Applications Using EBM                |

- *CIRP* : *China Institute for Radiation Protection*
- *JAERI* : *Japan Atomic Energy Research Institute*
- *JAPEIC* : *Japan Power Engineering Corporation*
- *JCAC* : *Japan Chemical Analysis Center*
- *JICA* : *Japan International Co-operation Agency*
- *KINS* : *Korea Institute of Nuclear Safety*
- *MINT* : *Malaysian Institute for Nuclear Technology Research*

- *NNSA* : *National Nuclear Safety Administration*
- *NUPEC* : *Nuclear Power Engineering Corporation, Japan*

### **3.2 Multilateral International Nuclear Co-operation in Asia (INCA)**

Australia, China, Japan, Indonesia, Malaysia, Philippines, Republic of Korea, Philippines, Thailand and Vietnam are currently participating in the International Nuclear Co-operation in Asia (INCA). This programme is fully funded by the Government of Japan through the Japan Atomic Industrial Forum (JAIF) and had the participation of Member States of the Far East. This multilateral co-operation was specifically designed to complement RCA activities and careful attention was taken not for the projects to overlap. The areas of co-operation are as follows:

- Utilisation of Research Reactor
- Application of Radioisotopes and Radiation in Medicine
- Application of Radioisotopes and Radiation in Agriculture
- Public Acceptance in Nuclear Energy
- Safety Culture

### **4.0 FUTURE PROSPECTS OF TCDC IN THE RCA PROGRAMME**

As stated in the Report of the High-Level Committee on the Review of Technical Co-operation among Developing Countries (UN General Assembly Official Records, 50th Session Supplement No. 39):

*“TCDC should adopt a more strategic focus by supporting initiatives in a number of high-priority areas such as trade and investment, debt, poverty alleviation, production and employment, macroeconomics policy co-ordination and the aid management, which were likely to have a major impact on a large number of developing countries”.*

The report also emphasised strategic initiatives and closer integration between TCDC and economic co-operation among developing countries (ECDC). It is proposed that TCDC in the RCA Programme should follow the concept of a “Smart Partnership” considering that RCA membership comprises of countries with a wide diversity in the socio-economic status as well as large differences in the national direction of advancement of nuclear technology and nuclear power programme.

Several mechanisms to facilitate the concept of “Smart Partnership” in TCDC could be as follows:

#### **4.1 Triangular Co-operation Arrangements**

Triangular co-operation arrangements are aimed to encourage developed Member States; Australia, Japan and New Zealand including IAEA, as donors to fund project activities among developing countries. To a certain extent, this mechanism has been successfully implemented among the RCA Member States. For example, Expert Advisory Group Meetings in Radiation Protection and Radiation Technology in

developing countries were hosted by Thailand, Malaysia and Vietnam and the extra-budgetary funding was provided by the Government of Japan.

Considering that the level of nuclear technology among Member States varies from one another and that each Member State has her own niche area of expertise, this triangular co-operation arrangement between developed, developing and least developed Member States, is appropriate to be implemented as TCDC. Through this mechanism, arrangements can be made to utilise expertise and facilities in developing countries such as Malaysia, China, Pakistan, Republic of Korea, Indonesia, India etc. to assist countries with lower development of nuclear technology such as Myanmar, Mongolia, Bangladesh and Sri Lanka. In turn, countries such as Malaysia, Thailand, Indonesia, Vietnam, Philippines and others where the nuclear technology are more reasonably developed, would receive assistance from more developed countries such as Australia, Japan and New Zealand.

There is a similar mechanism in the tripartite arrangement of the Japan International Co-operation Agency (JICA) where trainees are trained in developing countries to initially bridge the technological gap between least developed countries and Japan. This also proves to be more cost-effective to be implemented.

For RCA, this mechanism however, requires further discussion and consideration for it to be successfully implemented.

#### **4.2 Sub-contracting Implementation of IAEA TC Projects**

Under the concept of "Smart Partnership" to encourage TCDC, sub-contracting the implementation of the project components under the IAEA TC projects can also be considered in the region.

For instance, a TC project for example, Radiation Technology approved for Myanmar can be sub-contracted to the developing countries where the capability is already established such as in Indonesia, Malaysia and others. The sub-contracting Member State will be more appropriate to identify the needs, formulate, provide expert assistance, training and procure equipment (if necessary). This practice will ensure the use of regional experts commensurate with the technological level of the recipient countries. However, the funding should come from IAEA or donor Member States in the region. This arrangement will lead to the effective transfer of technology, in term of costs and the capacity technology absorption of recipient countries.

#### **4.3 Establishment of Regional Resource Units (RRUs)**

The RRU concept was developed during the formulation of the proposal for the next UNDP cycle (1997 – 2001). Several facilities within National Nuclear Research Institute (NNRI) in the developing countries are expected to take an increased leadership and mentoring role by acting as a Regional Resource Unit for an associated group of NNRI. The establishment of RRUs will facilitate the implementation of the "Smart Partnership" concept. The RRUs will be empowered through sub-contracting to carry out training activities aimed at increasing ownership and utilisation of regional experts in the region.

The National University of Singapore has provided Regional Training Center to facilitate validation and dissemination of the curriculum and to implement training and certification of tissue bank operators. Malaysian Institute for Nuclear Technology for Research (MINT) offers its STERIFEED plant for the IAEA/UNDP/RCA Project on Upgrading of Cellulosic Agrowastes to Useful Products and working closely with the Japan Atomic Energy Research Institute (JAERI).

#### **4.4 Establishment of Regional Model Project**

The plans for the establishment of a regional model project can be facilitated through TCDC, whereby experts from developing countries could identify the real common needs of RCA Member States perhaps through electronic networking.

#### **4.5 MOUs between Donors and Recipient Institutes**

To further facilitate TCDC, MOUs can be developed between RRUs or institutes for certain areas that could benefit the parties concerned.

#### **4.6 Networking and Dissemination of Information**

TCDC can also be strengthened through production of Regional Documents and Regional Newsletters using INIS as well as electronic networking capabilities between RRUs, NNRI, end-users and policy makers.

### **5.0 Conclusion**

In the past, the RCA programme supported a significant component of TCDC and current practice will further encourage this situation. Therefore in conclusion, the above mechanisms will only be successfully implemented, with the commitment of the donors (developed Member States and IAEA) in term of funding and the commitment of developing countries. These will be in terms of better infrastructure, financial and human resources including expertise made available. TCDC is a mechanism which should be supported by the participating Member States to encourage developing countries to further contribute to a more cost-effective transfer of technology and the optimisation of expert, financial and facility resources in the region.

#### **Reference:**

1. IAEA Database as of September 1997
2. TCDC in the RCA Programme, Current Status and Future Prospects, July 1996, Prof. A. Djalois, Indonesia and Mr. John Rolland, Australia
3. Strengthening TCDC in RCA Programme by P.D. Hien, CTO Joint UNDP/RCA, 1996
4. RCA Annual Report 1982 – 1996
5. IAEA TC Report, 1995

**Acknowledgement:**

Appreciation to all the Member States and the Secretariat for the providing the relevant information.

Dr. Ahmad Sobri Haji Hashim  
October 1997

**TERMINAL TRIPARTITE REVIEW MEETING  
OF RAS/92/073**

**MEETING SUMMARY AND ACTION LIST**

**Summary** The Tripartite Terminal Review Meeting of RAS/92/073 took place at BATAN, Jakarta on 16 July 1997. Documents reviewed included the report of an RCA/IAEA review of the Project in Yangon on 14 March 1997; the draft Terminal Report prepared by the Chief Technical Officer; and an Extended Summary collated by Australia as requested by the Member States at Yangon.

Additional material on the impact of the project was provided by case studies from the developing countries with participants at the meeting, and from a video that had been produced as part of the Project. This video was an outcome from the 1994 Joint Project Tripartite Review Meeting held in Vienna, September 1994 and an extra output in Public Awareness.

Overall the Meeting agreed with the conclusions, findings and recommendations of the Extended Summary and draft Terminal Report. Project RAS/92/073 was found to have been highly successful. Member States' ownership of the Project was well demonstrated. The Project had successfully upgraded the manpower capability of participating Member States in the targeted technologies and contributed to an increased use of, and capacity for, TCDC. It had promoted a high level of awareness and use of the technologies within industry, including environmental aspects of industrial operations. The case studies presented illustrated how the individual sub-projects had benefitted and led to sustainable use of the technologies in developing countries. The net result was that the Project had made a significant contribution to the promotion of environmentally sustainable growth in RCA Member States.

**The Meeting :**

- i) noted that the RCA/IAEA Review Meeting held in Yangon on 14 March 1997 had reviewed the Terminal Report - Ref T-8b-(UNDP-1)
- ii) noted that this Tripartite Review Meeting reviewed the Extended Summary document
- iii) endorsed the Extended Summary document, subject to the incorporation of minor amendments agreed at the Meeting, and
- iv) requested that the Extended Summary be issued together with the Terminal Report.

Participants discussed future directions. The plans for the future management of RCA were explained as being based around more streamlined management, with greater emphasis on routine field management from within the Region, and around thematic programming and TCDC. The meeting agreed that any further joint Project would need to demonstrate -

- \* a strong regional focus formulated around major themes
- \* a basis in problem solving, in partnership with public/private sector end-users
- \* quantifiable outputs of high impact
- \* increased utilisation of regional resource units and TCDC
- \* increased use of electronic media for networking for RCA and end-users
- \* cost effective or unique applications of isotope and radiation technologies.

**Action List** A number of actions were requested by the meeting.

1. Report of the RCA/IAEA Terminal Review, as amended, to be re-submitted to Member States, UNDP and IAEA.
2. Copy of the video 'Presenting RCA' and available material on the new management structure for RCA to be forwarded to UNDP in New York and Jakarta.
3. Extended Summary, as amended, to be incorporated in the draft Terminal Report and issued as a single document.
4. Mr Loebus to convey immediately the outcome of the Meeting to UNDP Regional Office, New York.

**ACTIONS TAKEN ON THE NEW JOINT UNDP/RCA/IAEA PROJECT SINCE THE 19<sup>th</sup> RCA WORKING GROUP MEETING**

**10-14 March 1997**

Member States discussed joint project at the 19th Working Group Meeting in Yangon. In view of the likely decrease in UNDP funding they prioritized the outputs areas as follows: (1) drinking water, (2) clean production processes, (3) marine coastal environment, and (4) air pollution. It was noted that there were no proposals in the field of drinking water and Member States were encouraged to develop suitable proposals in this field. A proposal entitled "Applications of Nuclear Techniques to Address Specific Red Tide Concerns" was supported in principle. The Agency was 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.

**22 April 1997**

A meeting took place in New York between the Agency and the Regional Bureau for Asia and the Pacific. The Agency was briefed about the Bureau's position on the project. At that time, UNDP thought they would be able to provide up to US \$ 600k yearly and hoped to be able to sign the document by the end of June. The Agency was requested to provide UNDP with a review by an independent reviewer in the environment field - preferably the US Environmental Protection Agency (USEPA).

**6 June 1997**

Dr. Robert Swank, of USEPA, provided a favourable review of the project which was forwarded to UNDP according to their request.

**Late June 1997**

UNDP advised that a large Project Approval Committee (PAC) meeting was scheduled to meet in mid July to compare a large number of project proposals and allocate programme resources. A Project Document would be required in time for the meeting. UNDP also let the Agency know that the Bureau's Programme was faced with severe internal budget cuts which were very likely to influence allocations to the joint project. The IAEA took immediate action to inform Member States about this development and invited them to express their support to the programme. Several Member States wrote letters of support to UNDP.

**1 July 1997**

After consultations with Mr. Peter Roberts, a Project Document format version of the joint programme was submitted in a Letter from Mr. Qian to Mr. Nay Htun. The budget requested US \$ 600,000 yearly, and the sub-projects on Information Networking and Benefit Awareness were merged into one output area. Otherwise, no significant changes were introduced.

**16 July 1997**

The joint project was discussed during the afternoon session of the Terminal Tripartite Meeting for RAS/92/073. Mr. Loebus of UNDP Jakarta reconfirmed the budget cuts in UNDP's operational budget, which were due to a shortfall in pledges. Mr. Loebus expressed satisfaction at the results of the meeting and the general direction of the RCA. He offered to convey these views quickly to Headquarters so that they may be reflected in the imminent PAC.

**17 July 1997**

The UNDP PAC agreed to support the project at a reduced level of funding, totaling US \$ 1,050k until the end of 1999.

**28 July 1997**

Following up on a proposal from the 15 July in Jakarta, Mr. Peter Roberts agreed to prepare a paper for the General Conference which would outline various options for the joint project, in view of the reduced funding level. The document would be prepared in collaboration with Messrs. Gangadharan and Aleta, and with input from several RCA and IAEA officials.

**12 September 1997**

UNDP forwarded the PAC minutes, requesting the IAEA to re-submit the project document. The IAEA offered to submit a finalized document following the decisions by RCA Member States at the General Conference. The IAEA was also requested to report on the prospects for cost-sharing by participating countries through UNDP.

**25 September 1997**

The IAEA called upon Member States to provide share the costs of the programme with the IAEA and UNDP - in particular the two sub-projects on clean drinking water and efficient production processes.

## **OPTIONS FOR A NEW UNDP/RCA/IAEA PROJECT**

### **SUMMARY**

The options for a new Joint UNDP/RCA/IAEA Project are considered based on the funding and preferred sub-projects indicated by UNDP.

The recommended content of the project is based on the 3 UNDP preferred sub-projects of Air Pollution, Marine Coastal Environment and Electronic Networking & Outreach. It is also recommended that activities outside the three UNDP funded sub-projects be supported in order to continue the development and application of skills in tracers, NCS and analytical techniques in other topics. These activities should be contained within an extra sub-project that applies the techniques either to Access to Clean Drinking Water or to Energy Efficient, Cleaner and Competitive Industry. Carrying out activities in both these topics is considered, but not recommended.

Options are considered for consolidating into the recommended project some of the activities contained in the original project proposal, and for funding the extra sub-project. The main text should be consulted for the rationale and details of the recommended project. The recommendations ( R1-R7) are:

**R1:** That Air Pollution, Marine Coastal Environment and Electronic Networking & Outreach sub-projects be adopted with activities based on (a) the September 1996 Workplan of NAT National Coordinators, (b) the Monaco PFM meeting plus Australian and Philippine proposals, and (c) the Nuclear Information Systems proposal put to the 19<sup>th</sup> WGM meeting by National Project Coordinators and RAS/0/019, respectively.

**R2:** That Project Formulation or Expert Advisory Group Meetings be held as soon as possible to finalise activities within the Air Pollution and Marine Environment sub-projects.

**R3:** That clarification be sought as soon as possible on UNDP funding for project administration; on the establishment and funding of a CTO position; on the use of residual funds from RAS/92/073; and on co-funding from Member States.

**R4:** That the options of basing the project on (a) all the original proposal activities or (b) on the UNDP supported sub-projects alone, be rejected.

**R5:** That efforts be made to also fund an extra sub-project on either Clean Drinking Water or Energy Efficient, Cleaner and Competitive Industry, but not both; and that the 1997 RCA General Conference Meeting decide which of these options to adopt.

**R6:** That, if an "industrial" sub-project is adopted, RAS/8/078 (Tracers and NCS) be incorporated within it, and that consideration be given to the incorporation of the NDE component of RAS/8/077.

**R7:** That a Project Formulation meeting be authorised for the sub-project adopted, and that Member States and the Agency consider activities that they wish to propose and co-finance.

**TABLE 1: COMPARISON OF REQUESTED AND INDICATED FUNDING (US\$'000) 1997/99**

| Sub-project                           | RCA Priority | Requested <sup>a</sup> |                        |                        |                        | Indicated        |                   |                  |             |
|---------------------------------------|--------------|------------------------|------------------------|------------------------|------------------------|------------------|-------------------|------------------|-------------|
|                                       |              | UNDP                   | IAEA                   | RCA <sup>b</sup>       | Total                  | UNDP             | IAEA <sup>c</sup> | RCA              | Total       |
| Clean Drinking Water                  | 1            | 300<br>(550)           | 500<br>(50)            | -                      | 800<br>(600)           | -                | -                 | -                | -           |
| Marine Coastal Environment            | 3            | 250<br>(500)           | 150<br>(200)           | 400<br>(400)           | 800<br>(1100)          | 250              | 100               | 375 <sup>d</sup> | 725         |
| Air Pollution                         | 4            | 800<br>(350)           | 70<br>(100)            | -                      | 870<br>(450)           | 500              | -                 | -                | 500         |
| Energy Efficient and Cleaner Industry | 2            | 500<br>(600)           | 150<br>(150)           | 400<br>(400)           | 1050<br>(1150)         | -                | -                 | -                | -           |
| Electronic Networking & Outreach      | 5            | 650<br>(600)           | 130<br>(0)             | -                      | 780<br>(600)           | 300 <sup>e</sup> | 100               | 425 <sup>f</sup> | 825         |
| Safety Awareness                      | 5            | -                      | -                      | 400<br>(400)           | 400<br>(400)           | -                | -                 | -                | -           |
| Programme Management                  | -            | 500<br>(300)           | 1000<br>(600)          | -                      | 1500<br>(900)          | -                | 500               | -                | 500         |
| Unassigned                            | -            | -                      | -                      | 500<br>(500)           | 500<br>(500)           | -                | 500               | 100 <sup>g</sup> | 600         |
| <b>TOTAL</b>                          |              | <b>3000<br/>(2900)</b> | <b>2000<br/>(1100)</b> | <b>1700<br/>(1700)</b> | <b>6700<br/>(5700)</b> | <b>1050</b>      | <b>1200</b>       | <b>900</b>       | <b>3150</b> |

KEY TO TABLE: SEE NEXT PAGE

## Key to Table 1

- a) Figures unbracketed are the requests and estimates put forward by the Agency in the July 1997 Project Document after initial discussions with UNDP. Figures in brackets are the requests and estimates in the original Project Formulation Framework agreed at the 1996 General Conference Meeting.
- b) Only anticipated cash contributions are listed here. In-kind support was estimated to raise the total RCA contribution to \$2,990,000 in the Project Document. Anticipated cash funding for specific sub-projects was derived from previous developed country support, and the unassigned contribution was estimated from previous developing country support.
- c) No decisions have been made on the distribution of the Agency budget to specific activities. Figures for discussion only.
- d) Philippine funds (\$50k) plus possible Australia funds (\$325k).
- e) Extra funding possible from the Asia-Pacific Information Development Programme.
- f) Possible Australian funds.
- g) Estimated further cash contributions from Member States.

## 1. INTRODUCTION

In July 1997 UNDP informed RCA and IAEA that it was prepared to provide US\$1.05M to the end of 1999 for a new Joint Project. UNDP also indicated that the funds should be used for three specific sub-projects.

Table 1 shows the differences between a) the original proposal agreed by RCA at the 1996 Working Group and General Conference meetings, b) the final proposal submitted by the Agency following discussions between UNDP and Agency officials, and c) the actual funding to be provided. The Table also shows the priority order assigned to the sub-projects at the 1997 Working Group Meeting.

This paper discusses the issues arising from these substantial differences and suggests options for the final project content. It uses information available in early September on the co-financing likely to be provided by the Agency and Member States.

## 2. MAJOR STRATEGY REQUIREMENTS FOR THE JOINT PROJECT

The final project design should -

- a) Meet the wishes of the UNDP in terms of their indicated priorities. This is important for future credibility and funding.
- b) Have sufficient impact within each chosen sub-project to ensure UNDP satisfaction with the overall project. This will maximise the opportunity for future funding.
- c) Encourage, as far as possible, the application and development of a wide spectrum of nuclear methods, and involve as many research groups within RCA Member States as possible.
- d) Maximise the potential for co-financing by Member States (or possibly other outside organisations). Such co-financing is expected by UNDP, and is essentially a requirement. However, this co-funding is unlikely to occur unless sub-projects meet the priority needs of RCA Member States (and their nuclear institutes).

## 3. SITUATION ANALYSIS FOR AIR, MARINE AND NETWORKING SUB-PROJECTS.

UNDP indicated that would like to support three sub-projects on Air Pollution Assessment, Marine Coastal Environment and its Pollution, and Electronic Networking and Outreach.

**3.1 Air Pollution.** RCA has carried out only limited activities on air pollution monitoring and NAT. Nevertheless, a National Coordinators Meeting on NAT in September 1996 proposed a relatively ambitious workplan for a sub-project on Air Pollution. Its cost was estimated recently by the Agency Technical Officer as close to the US\$500k awarded by UNDP. The September 1996 work plan can be the basis for the Air Pollution sub-project. It should be scrutinised further by National Coordinators or a small Expert Group to ensure that the overall goals are appropriate to the funding available.

**3.2 Marine Contamination.** In November 1995 a formulation meeting for a possible project was held at the IAEA Marine Environment Laboratory, Monaco. Its recommendations are available as the basis of a sub-project. The meeting recognised that this subject was new to RCA and that further planning would be needed since marine sampling was potentially expensive and required good coordination. The PFM in Monaco suggested a programme that was estimated to cost approximately US\$450k in the first 3 years, with further costs of US\$270k for ship hire and equipment costs.

If ways can be found to meet these latter costs outside UNDP and/or to reduce the level of activities somewhat, a reasonable project seems possible after further planning based on the PFM recommendations and the US\$250k UNDP funds.

Australia is planning to make approximately US\$130k available for a project on Sustainable Development of the Coastal Zone in the period 1 July 1997 to 30 June 1998, and is hopeful that similar funding would be available beyond that period. The Philippines submitted a project on the Red Tide problem that was accepted at the 19th Working Group Meeting and has offered US\$50k funding. By combining these proposals with the UNDP-funded activities, a substantial sub-project would be assured.

**3.3 Electronic Networking & Outreach.** Recent National Project Coordinators Meetings in Nuclear Information Systems have discussed activities for a new UNDP joint project. The proposal can form the basis of a new Networking project. The proposal was estimated to require US\$310k from UNDP prior to the end of 1999 (with a further US\$40k from IAEA/RCA). This is close to the US\$300k awarded by UNDP. There are also indications that UNDP may provide extra funds through the Asia-Pacific Information Development Programme. Related to this project is another RCA project (RAS/0/019) on Nuclear Information Systems.

Australia is planning to make approximately US\$170k available for a project on Strengthening of Radiation Protection Infrastructures for the period 1 July 1997 to 30 June 1998, and is hopeful that further similar funding would be available beyond that period. This was originally the basis of a sub-project on 'Safety Awareness'. This sub-project could be combined with Electronic Networking & Outreach to make a single large programme of substantial impact. Japan has also indicated that some funding might be made available for Networking activities from its contribution.

*R1: That Air Pollution, Marine Coastal Environment and Electronic Networking & Outreach sub-projects be adopted with activities based on (a) the September 1996 Workplan of NAT National Coordinators, (b) the Monaco PFM meeting plus Australian and Philippine proposals, and (c) the Nuclear Information Systems proposal put to the 19<sup>th</sup> WGM meeting by National Project Coordinators and RAS/0/019, respectively.*

*R2: That Project Formulation or Expert Advisory Group Meetings be held as soon as possible to finalise activities within the Air Pollution and Marine Environment sub-projects.*

## **4 ISSUES FOR CONSIDERATION**

### **4.1 NUCLEAR SCIENCE ACTIVITIES**

If the new Joint Project concentrated on just the three UNDP-funded sub-projects, then each could achieve high impact outcomes. It would also be in accordance with UNDP priorities.

However the project is a joint project, and RCA priorities are also valid. Restricting the project to the three sub-projects would mean that :-

- a) the only activity related to industry and economic growth left in the RCA programme would be in the Thematic Programme on Advanced Radiation Technologies;
- b) there would be no activities within the topic of Clean Drinking Water. This was the first priority of Member States and is a major development issue for most developing countries in the Region:

- c) there would be no further development of some core nuclear methods except as related to air and marine contamination. Examples are tracers (radioactive and stable), analytical techniques (NAT) and nucleonic control systems (NCS). These techniques have been developed to a stage where they are now of increasing use in improving industrial efficiency and in the measurement of ground and surface water pollution. In contrast, RCA has limited experience in their application to air pollution and marine environments, and basic development of methodologies and staff training is still required in most States.
- d) RCA Member States have not provided significant co-financing for the previous Air and Nuclear Information Systems sub-projects. This may be an indication of priorities/existing expertise in many Member States.

To restrict the new Joint Project to the UNDP-funded sub-projects may risk an imbalance to the overall portfolio of RCA activities. In particular, the project would initially be concerned mainly with training activities rather than with applications of techniques already developed to sustainable levels in earlier RCA and Joint Projects. There may also be some concern about Member States' commitment to co-financing.

## 4.2 FUNDING

- 4.2.1 UNDP has declined to fund project administration (US\$500k was requested). Examples of obligatory costs would be Tripartite Review Meetings, Project Evaluation Reviews and Reports and some official travel. If this amount has to be subtracted from sub-project funds, then true activity funding would be substantially reduced. This issue requires urgent clarification.
- 4.2.2 UNDP does not usually support the purchase of equipment from more than a small fraction of project funds. However, the cost of equipment needed for development of the Nuclear Information Systems network (US\$140k) and other similar costs appears to have been accepted.
- 4.2.3 The IAEA is willing to compensate for some of the shortfall in UNDP funding in order to enable the successful implementation of the project. It has so far indicated that a yearly contribution of US\$400,000 may be allotted, if the final sub-project proposals are of sufficient quality. This would be a significant increase over funding for the previous project. On this basis, the estimate for the Agency's indicated funding prior to the end of 1999 is taken as US\$1,200,000. A final allocation to specific project activities has not yet been made.

The Agency previously provided funds for a Chief Technical Officer (CTO). RCA should decide whether a CTO is required for the new Project. Assuming that Agency funds are used to cover the costs of a CTO and part of the administration costs, then a reasonable estimate of Agency funds available for direct sub-project activities would be about US\$700k.

- 4.2.4 Some US\$56k remains as a residue of the previous project. RCA and the Agency should request that these funds be made available for initial activities, such as project formulation, in the new project.
- 4.2.5 Early confirmation of Member States contributions would be of assistance.

*R3: That clarification be sought as soon as possible on funding for project administration; on the establishment and funding of a CTO position; on the use of residual funds from RAS/92/073; and on co-funding from Member States.*

## **5 OPTIONS FOR PROJECT ACTIVITIES**

### **5.1 Option 1: Base project on original proposal**

One option would be to attempt to carry out most of the activities of the original proposal. This could be done in several ways.

- a) Non-UNDP funding could be sought to make up the shortfall to the original amount requested. This is rejected as unrealistic in the time available.
- b) UNDP could be asked to re-consider their decision and to provide substantially greater funding. The Agency and UNDP have had discussions over many months and the total funding and priority aims of UNDP are very clear. This is also rejected as unrealistic.

UNDP has not, however, ruled out some increase in their funding provided there was increased cost sharing by Member States. UNDP also indicated that further funding could be available through the Asia-Pacific Information Development Programme for the Networking sub-project.

- c) A low level of activity with minimum funding could possibly be maintained in all proposed sub-projects not supported by UNDP. This would risk the outcomes having low impact and value, and is also rejected.

Overall, this option is not supported.

### **5.2 Option 2: Base Project Solely on UNDP Supported Sub-Projects**

This option is rejected, based on the arguments of section 4.1. Briefly, this option would lead to a high impact project and respond to the UNDP directions. However, several activities of importance would no longer be supported within either RCA or Joint projects.

*R4: That the options of basing the project on (a) all the original proposal activities or (b) on the UNDP supported sub-projects alone, be rejected.*

### **5.3 Option 3: Base Project on UNDP Sub-projects Plus an Extra Sub-Project(s)**

Rejection of options 1 and 2 leads to the conclusion that RCA should consider how to conduct a compromise project. A possibility is a project that includes the UNDP priority sub-projects and adds a further sub-project(s) that applies tracers, NCS and NAT in more traditional ways. The obvious possibilities would be based on the Clean Drinking Water and the Energy Efficient, Cleaner Industry sub-project proposals.

### **5.4 Option 3A: Extra Sub-Project on Access to Clean Drinking Water**

RCA made this sub-project their first priority. Within the previous project and other RCA work, training has been provided in using isotopes to monitor ground and surface water pollution. The possibilities for applications of stable and radioactive isotope tracers and of NAT in this topic are considerable. However, by early September, no firm proposals had been submitted by RCA Member States. Funding support would have to come from the Agency funds and from new commitments from Member States. It is also noted that several agencies in the Region, such as ESCAP, UNEP, ADB etc., have major development programmes related to the security of the water supply.

### **5.5 Option 3B: Extra Sub-Project on Energy Efficient, Cleaner Industry**

Several Member States have stated a preference to continue an emphasis on industrial and, therefore, economic growth within the Project. This sub-project was the RCA second priority. Previous training in tracers and NCS and, possibly, in NDE could be applied effectively in such a sub-project.

One specific new proposal tabled to date is an Agro-Waste treatment programme (Japan and Malaysia). This project could be moved forward at modest cost as a feasibility study prior to an application for major funding in 1999. RCA activities related to industrial efficiency are also contained in RAS/8/078 on Nucleonic Control Systems and Tracers.

Funding support could come from Agency funds and from new commitments by Member States. However, there are other possibilities to increase the size and impact of this sub-project that could also increase the opportunities to negotiate extra UNDP funding on the basis of greater co-financing of the project. One such possibility would be to incorporate RAS/8/078 (NCS and Tracers) into the Joint Project. Another would be to incorporate the RCA project on NDE (which is part of RAS/8/077) within the Joint project. This would reverse an earlier RCA decision to place NDE outside the Joint Project. However, Member States have provided strong financial support recently for NDE, and if this financial support was transferred to the Joint Project, there could be a case to re-negotiate funding with UNDP.

### **5.6 Option 3C: Two Extra Sub-Projects**

Member States may also wish to consider carrying out activities in both Clean Drinking Water and Energy Efficient, Cleaner Industry sub-projects. This would have implications both for funding and for project outcomes and impact.

### **5.7 Funding Issues Related to an Extra Sub-Project(s)**

The only cash funding available for Options 3A, B and C appears to be from Agency funds and from any further contributions from Member States. There is an option to request UNDP

to reduce their funding in one or more of their sub-projects and redistribute it to the extra sub-project(s). This is considered unwise at this time.

Japan has indicated that strong support for RCA is likely to continue but that this will be directed towards its traditional areas for support of radiation technology, protection and medicine. Some support for the Networking sub-project is possible. Support for "environmental" projects is unlikely. Australia and the Philippines have indicated support for activities within the UNDP funded sub-projects.

Section 4.2.3 noted that a reasonable estimate for the amount of Agency funding available for sub-project activities was US\$700k. It would be prudent to assign about US\$200k to back-stop the UNDP funded sub-projects, leaving US\$500k for the extra sub-project(s). Further Member States' cash contributions up to the end of 1999 are conservatively estimated at US\$100k. The total available for an extra sub-project(s) is, therefore, about US\$600k. This is shown as 'unassigned' in Table 1.

One extra sub-project funded to about US\$600k would be of comparable size to the UNDP funded sub-projects, and should ensure significant outcomes and impact. However, to split this amount between two sub-projects may risk neither being adequately resourced.

*Recommendation 5: That efforts be made to also fund an extra sub-project on either Clean Drinking Water or Energy Efficient, Cleaner and Competitive Industry, but not both; and that the 1997 RCA General Conference Meeting decide which of these options to adopt.*

*Recommendation 6: That, if an "industrial" sub-project is adopted, RAS/8/078 (Tracers and NCS) be incorporated within it, and that consideration be given to the incorporation of the NDE component of RAS/8/077.*

*Recommendation 7: That a Project Formulation meeting be authorised for the sub-project adopted, and that Member States and the Agency consider activities that they wish to propose and co-finance.*

## **6. POSSIBLE PROJECT SCOPE**

Table 2 outlines the overall design of a possible new Joint Project. It contains the three UNDP funded sub-projects and, for discussion and a decision, both the extra sub-projects. The Table distributes Agency funding among the sub-projects, but this is for guidance only. The precise distribution would be a matter for further consideration.

**TABLE 2: OUTLINE OF A NEW JOINT PROJECT (FOR DISCUSSION)**

|  |                                  |
|--|----------------------------------|
| Sub-project: #1  | Title: Air Pollution Assessments |
| Goal: Application of isotope techniques to assessment of air pollution, particularly its trends and movements in the region. | Funding: UNDP @ \$500,000        |
| Basis: Work plan put forward by last NCM of old project  |                                  |
| Notes: Coordinators/Expert Group to revise work plan in view of funding 'increase'   |                                  |

|  |  |
|--|--|
| Sub-project: #2  | Title: Marine Coastal Environment  |
| Goal: Applications of isotope techniques to the improved management of the marine coastal environment and its pollution. | Funding: UNDP \$250,000; Australia \$325,000 (approx)*; Philippines \$50,000 Agency \$100,000* |
| Basis: Work plan of 1995 Project Formulation in Monaco; Australian AusAID proposal; Philippine proposal on Red Tide      |  |
| Notes: Project Formulation to reduce scope of Monaco workplan to fit reduced budget and incorporate Red Tide proposal    |  |

|   |   |
|---|---|
| Sub-project: #3   | Title: Electronic Networking & Outreach                                 |
| Goal: Upgraded electronic networking capability for National Nuclear Research Institutes and their end-users; Improved awareness of the availability, benefits and safe practices of radiation and isotope applications among end-users | Funding: UNDP \$300,000; Australia \$425,000 (approx)*; IAEA \$100,000* |
| Basis: NCM recommended workplan; Australian AusAID proposal   |   |
| Notes: Confirm possibility of further UNDP funding  |   |

|  |   |
|--|---|
| Sub-project: #4A   | Title: Clean Drinking Water                             |
| Goal: Applications of isotope techniques to problems related to access to clean drinking water | Funding: IAEA \$500,00*<br>RCA contributions \$100,000* |
| Basis: To be decided at Formulation Meeting  |   |
| Notes: Member State proposals required   |   |

|  |  |
|--|--|
| Sub-project: #4B   | Title: Energy Efficiency & Cleaner Production in Industry                    |
| Goal: Applications of isotope techniques to enhance energy efficiency, cleaner production and competitiveness in major | Funding: IAEA \$500,000*<br>Transfer of RAS/8/078 and NDE part of RAS/8/077? |

|  |                              |
|--|------------------------------|
| regional industries.   | RCA contributions \$100,000* |
| Basis: Agro-waste proposal; RAS/8/078; if agreed, NDE activities.<br>Project Formulation required. |                              |
| Notes: Further Member State proposals required   |                              |

|  |                          |
|--|--------------------------|
| Sub-project: #5  | Title: Administration    |
| Goal: Effective implementation and reporting                                       | Funding: IAEA \$500,000* |
| Basis:   |                          |
| Notes: Clarify UNDP position on funding; then use minimum IAEA funds for shortfall |                          |

\* to be confirmed; tentative only.

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# RCA ACTIVITIES AND BUDGET IN 1997

## 1. PROJECTS

### A. Number

|                               |           |           |
|-------------------------------|-----------|-----------|
| • Number of Projects          |           | <b>22</b> |
| <i>(1 January 1997)</i>       |           |           |
| • From Previous Years         | <b>11</b> |           |
| • New                         | <b>11</b> |           |
| • Completed through           |           | <b>5</b>  |
| <i>(25 September 1997)</i>    |           |           |
| • To be completed by year-end |           | <b>2</b>  |
| • On-going                    |           | <b>17</b> |



# RCA ACTIVITIES AND BUDGET IN 1997

## 1. PROJECTS (cont'd)

### B. Funding

- |   |  |           |           |
|---|--|-----------|-----------|
| • | Funded by the <b>Agency</b>                                    |           | <b>11</b> |
| • | Fully  | <b>10</b> |           |
| • | Partly (seed money)  | <b>1</b>  |           |
| • | Funded Jointly by the<br><b>Agency and RCA Countries</b>       |           | <b>4</b>  |
| • | Funded by <b>RCA Member<br/>States jointly or individually</b> |           | <b>6</b>  |
| • | Funded by <b>UNDP (RAS/8/071)</b>                              |           | <b>1</b>  |



# RCA ACTIVITIES AND BUDGET IN 1997

## 1. PROJECTS (cont'd)

### C. **Financial Summary** *(25 September 1997)*

|                       | <i>(US\$ Million)</i> |
|-----------------------|-----------------------|
| • Adjusted Programme  | <b>3.0</b>            |
| • TCF Funds           | <b>1.9</b>            |
| • Implementation Rate | <b>29.5%</b>          |
| • Earmarkings         | <b>2.1</b>            |



# **RCA ACTIVITIES AND BUDGET IN 1997**

## **2. CO-ORDINATED RESEARCH PROJECTS (CRPs)**

- **Six** RCA-related CRPs are being implemented in 1997 by the Department of Research and Isotopes



# **RCA ACTIVITIES AND BUDGET IN 1997**

## **RCA-related CRPs implemented in 1997**

1. Air Pollution Using Nuclear Related Analytical Techniques
2. The Standardization of I-131 Treatment for Hyperthyroidism with an Intent to Optimize Radiation Dose and Treatment Response
3. Radiation Processing of Indigenous Natural Polymers
4. Isotopic Evaluations in Infant Growth Monitoring
5. Market Development of Irradiated Food in Asia and the Pacific
6. Compilation of Analytical, Physiological and Metabolic Characters for a Reference Asian Man Studies



# RCA ACTIVITIES AND BUDGET IN 1998

## 1. PROJECTS

### A. Number of Projects

|                         |    |
|-------------------------|----|
| • ALL                   | 15 |
| • Started in 1997       | 11 |
| • Started prior to 1997 | 4  |



# RCA ACTIVITIES AND BUDGET IN 1998

## 1. PROJECTS (cont'd)

### B. Funding

- Funded by the Agency 9
- *To be funded jointly by UNDP/RCA/IAEA* 1
- Funded by RCA Member States 3
- Footnote a/ projects awaiting donors (partially funded by the IAEA in 1997) 2



# RCA ACTIVITIES AND BUDGET IN 1998

## 1. PROJECTS (cont'd)

### B. Funding (cont'd)

|                              |                       |
|------------------------------|-----------------------|
| • BUDGET ESTIMATE            | <i>(US\$ million)</i> |
| • TCF funding (hardcore)     | <b>2.604</b>          |
| • RCA Member States' funding | <b>0.320</b>          |
| • UNDP                       | <b>0.350</b>          |



# **RCA ACTIVITIES AND BUDGET IN 1998**

## **2. CO-ORDINATED RESEARCH PROJECTS (CRPs)**

- ◆ **Eight** RCA-related CRPs are expected to be implemented in 1998 by the Department of Research and Isotopes



# **RCA ACTIVITIES AND BUDGET IN 1998**

## **RCA-related CRPs expected to be implemented in 1998**

1. Air Pollution Using Nuclear Related Analytical Techniques
2. Ingestion and Organ Content of Trace Elements of Importance in Radiological Protection
3. The Standardization of I-131 Treatment for Hyperthyroidism with an Intent to Optimize Radiation Dose and Treatment Response
4. Radiation Processing of Indigenous Natural Polymers
5. Isotopic Evaluations in Infant Growth Monitoring
6. Market Development of Irradiated Food in Asia and the Pacific
7. Research and Development in Radiation Vulcanization of Natural Rubber Latex
8. Compilation of Analytical, Physiological and Metabolic Characters for a Reference Asian Man Studies



## RCA PROJECTS TO BE CONTINUED BEYOND 1997

| <i>No</i> | <i>Code</i> | <i>Project Title</i>                            | <i>1998</i> | <i>1999</i> | <i>2000</i> | <i>2001</i> |
|-----------|-------------|---|-------------|-------------|-------------|-------------|
| 1.        | RAS/0/021   | Nuclear Power Planning                          | x           |             |             |             |
| 2.        | RAS/0/022   | Public Acceptance & Trade in Irradiated Food    | x           |             |             |             |
| 3.        | RAS/0/023   | Energy, Electricity & Nuclear Power Planning    | x           |             |             |             |
| 4.        | RAS/0/024   | Project Formulation Mtgs.                       | x           |             |             |             |
| 5.        | RAS/7/008   | QA in Rad. Sterilization of Tissue Grafts       | x           |             |             |             |
| 6.        | RAS/8/078   | Nucleonic Control Systems & Tracer in Industry. | x           |             |             |             |
| 7.        | RAS/9/006   | Strengthening of Rad. Protection Infrastructure | x           |             |             |             |
| 8.        | RAS/9/018   | Rad. Protection Infrastructures (Phase III)     | x           |             |             |             |



## RCA PROJECTS TO BE CONTINUED BEYOND 1997 (cont'd)

| No  | Code      | Project Title  | 1998 | 1999 | 2000 | 2001 |
|-----|-----------|--|------|------|------|------|
| 9.  | RAS/4/016 | Preparation for<br>LILW Disposal<br>from Non-Power<br>Sources    | x    | x    |      |      |
| 10. | RAS/6/027 | QA in Radiation<br>Therapy                                       | x    | x    |      |      |
| 11. | RAS/6/029 | Improved Training<br>for Nuclear<br>Medicine<br>Technicians      | x    | x    |      |      |
| 12. | RAS/8/076 | Better Manag. of<br>Environment &<br>Industrial Growth           | x    | x    |      |      |
| 13. | RAS/8/077 | Them. Progr. on<br>Advanced<br>Techniques for<br>Industry (UNDP) | x    | x    |      |      |
| 14. | RAS/0/025 | Development of<br>TCDC in Asia &<br>the Pacific (Phase<br>III)   | x    | x    | x    | x    |
| 15. | RAS/6/028 | Them. Programme<br>on Health Care                                | x    | x    | x    | x    |

## **COUNTRY STATEMENT**

### **AUSTRALIA**

#### **TWENTY SIXTH GENERAL CONFERENCE MEETING OF THE REPRESENTATIVES OF RCA MEMBER STATES**

**VIENNA 1 OCTOBER, 1997**

Mr Chairman, Delegates, Ladies and Gentlemen

On behalf of the Australian delegation I wish to congratulate you, Mr Chairman, on your election to the position of Chairman for the 26th General Conference Meeting of Member States. The Australian delegation is appreciative of the excellent arrangements made by the Myanmar Government in hosting the 19th RCA Working Group Meeting in Yangon, including the arrangements made to celebrate the Silver Anniversary of the RCA. We also welcome the activities this week to further mark this 25<sup>th</sup> anniversary, including the reception and the commemorative publication "RCA: A Window to the Future" co-ordinated by Dr Carlito Aleta.

Australia congratulates Dr Carlito Aleta on his appointment as RCA Coordinator and ensures him of our continuing support and assistance in his endeavours to achieve the aims and objectives essential to the ongoing strength of the RCA Programme.

#### **RCA Management**

Australia strongly supports the moves being made to transfer more of the operational management of the RCA programme to RCA Member States and is appreciative of the continuing efforts of the Department of Technical Co-operation to stimulate and facilitate these changes on an evolving basis.

To the above end, Australia urges that priority be attached to the necessary actions associated with the revision of the procedures and practices governing the management of the RCA. Much of the groundwork for this has already been completed. At the 25th RCA General Conference Meeting held in Vienna in 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. The document prepared by Mr Cherif from the Director General's Office entitled "Guidelines and Operating Rules for the RCA Programme" provides a helpful and detailed set of procedures based on the new RCA management arrangements.

At this time in the history of the RCA, it is appropriate to also look ahead and Australia therefore welcomes the consideration at this meeting of the vision paper, "RCA in the Next 25 Years" co-ordinated by Professor Djaloelis, Indonesia.

### **Australian Funded Projects**

Australia is considering providing approximately A\$1.5 million over the next three years in support of a project on "The Application of Radioisotope Technology to Sustainable Infrastructure Development in Asia and the Pacific". We envisage that two of the components of this project relating to coastal zone marine pollution and electronic networking and outreach in the terms of distance learning and education in the strengthening of radiation protection infrastructures would be included within the new UNDP supported project.

Australia is pleased to note positive progress with a number of ongoing projects financially supported by Australia as outlined below.

### **Industrial Applications of Isotope and Radiation Technology**

This sub-project has been designed to achieve technology transfer through a series of regional training courses and national seminars. The activities covered a range of subjects such as application of nuclear techniques to process optimisation in the chemical and refining industries, application of nuclear techniques to the metal and manufacturing industries and application of nuclear techniques to coastal engineering.

An important component has been the transfer of column scanning technology to Bangladesh, Indonesia, Korea, Thailand, Myanmar and the agreement by Australia to provide the technology to Vietnam from residual project funds. In addition, this technology is also being transferred to Cuba, Bolivia, Algeria and regional Latin America.

### **Industrial Radiation Protection**

This sub-project aims to improve the knowledge and expertise of users of radioactive materials in industry. The application of distance learning techniques has provided a useful approach to the problems associated with the development of basic minimum radiation standards and practices as well as the infrastructure for the implementation of these standards and practices.

An IAEA/RCA Regional Workshop on the Distance Learning Project on Radiation Protection was held at Lucas Heights in March 1997. Fourteen countries were represented. The participants were supplied with draft copies of 19 of the 25 planned modules, Introductory Notes for Supervisors and Introductory Notes for Regulatory Authorities and Supervisors. A total of 15 modules were reviewed by the participants.

Trials of the material will commence early in 1998 and will be co-ordinated by ANSTO. Three countries (Philippines, New Zealand and Korea) have confirmed their

intention to participate in the first phase of the trials. Mongolia and Thailand have expressed informal interest in participating in the trials.

### **Nuclear Medicine**

The objective of this sub-project is the development of a program of distance education for nuclear medicine technologists by the provision of practical training materials which can be used either for self-study or as a component of training courses being offered.

The Pilot Study for Part 1 of the Distance Assistance Training Programme for Nuclear Medicine Technologists has been completed and refinements to all the teaching materials are nearing the final format for publication. The final assessment visits in November/December 1996 found that several students had not demonstrated they had completed all requirements. An extra three months was allowed for completion and four students undertook a further final assignment which was designed specifically to further assess their understanding of subjects and concepts. This extra assessment was successfully completed and a full set of results submitted to the IAEA in June 1997 for the issue of the final certificates.

In activities running parallel to the pilot study, Bangladesh has advised that the materials are being trialed independently along with tutorials and is forming the basis of the country's first training course for nuclear medicine technologists; in China the material has been translated; in Pakistan it is being used alongside their developing one year diploma course; and the Philippines, Thailand and Sri Lanka are considering inclusion of the material in other courses including physician training in nuclear medicine. At the request of a number of Members States, SPECT modules will be developed and trialed during the next phase of the project.

### **Other Australian Involvement in the RCA Programme**

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.

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) held 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) held 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 program, including the Project Formulation Meeting for the Project to Strengthen Radiation Protection Infrastructures held in Korea from 24-28 February, 1997, the Workshop on Waste Inventory, Waste Characteristics and Reference Site Candidates held in Shanghai on 7-9 July 1997, and the Expert Meeting on Development of a Sectoral Strategy for Nuclear Medicine in Health Care held in Jakarta from 1-5 September, 1997.

### **The New Joint UNDP/RCA/IAEA Project**

Australia has been pleased to note the generally positive response from the UNDP on its financial support of the new project proposal RAS/8/076 entitled "Better Management of the Environment, Natural Resources and Industrial Growth through Isotope and Radiation Technology" and looks forward to the early commencement of this important project. Australia is planning to provide financial support for the new project as indicated above.

### **TCDC in the RCA Programme**

Australia looks forward to the issue associated with enhancing the implementation of the TCDC modality being further pursued during this meeting and also during the subsequent Tripartite meeting with the other two Regional Agreements. The paper circulated by Dr Sobri, Malaysia, represents a useful summary of the status of TCDC within the RCA. There are a set of recommendations relating to the implementation of TCDC arising from the 1996 RCA General Conference and Tripartite meetings which remain to be fully addressed and this needs attention by both the Secretariat and Member States.

### **Conclusion**

Australia indicated in its statement to this year's General Conference that "of enduring concern to us in the technical co-operation area is the IAEA's Regional Co-operation Agreement for Asia and the Pacific which, in 1997, is marking its twenty-fifth year. This programme has proved to be an important and effective tool for promoting regional co-operation in the nuclear area. In fact, the RCA has now become the key regional instrument in that respect, with a heavy emphasis on regional management arrangements pursuant to the objectives of TCDC. Australia sees it as important, incidentally, for the RCA to broaden its funding base, both externally from relevant international organisations and from within the RCA framework. The increasing number of RCA Member States making direct financial contributions to the program is particularly welcome."

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 over the next 25 years in providing an effective means for providing the benefits of the peaceful applications of nuclear science and technology to our Region.

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**COUNTRY STATEMENT ON RCA :  
PEOPLE'S REPUBLIC OF BANGLADESH**

**Mr. President  
Distinguished Delegates  
Ladies and Gentlemen**

Bangladesh has accrued benefit from RCA 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 result 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, and national research institutes in RCA countries and all others who have contributed to the success of the objectives.

I would now like to relate the salient points of our involvement in various RCA projects. In NDT, our activities encompass three distinct directions, namely development of human resources, dissemination of the techniques and providing services to local organizations. NDT services using Radiographic, Ultrasonic, Eddy current, Magnetic particle and Liquid dye penetrant testing methods were provided to local power stations. We continued our training and certification programmes aimed at strengthening the infrastructure.

Under industrial Tracer Technology a physical model (Closed Circuit Flow Rig) was installed and used for conducting experiments like RTD analysis, Flow-rig measurements, Dead Volume measurements, Mixing Studies, Recalculation Studies and Parallel Flow Studies. A tracer laboratory with financial inputs of the Government was also set up. Some supporting equipment was received. 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 was held.

Under the programme on radiation technology, Polymers and composites under UV radiation have helped improving mechanical strength of the materials. These findings will be of much help to the implementation of the Pilot Plant that is under the active consideration of the government. 200 KCi Gamma Source is envisaged for this Pilot Plant on Wood Plastic Composite (WPC). The project on the improvement on natural rubber latex is in a stage of further improving the testing strength of rubber. Some additives have already been identified in this respect.

In the field of nuclear analytical techniques, BAEC continued to provide services to different local organizations, both in the public and private sectors on analysis

of various parameters of industrial, agricultural, biological, clinical and environmental samples. Based on the expertise attained analytical in analytical method, the BAEC was selected as a member of the National Technical and Expert Committee on Arsenic contamination in ground water of the country and 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 under taken 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.

### **Ladies and Gentlemen**

In the field of Food and Irradiation Process Control and Acceptance, evaluation of process control aspects, economic analysis and consumer acceptance was studied. Also, scaled up semi-commercial irradiation processing of prospective food items like onions, pulses and dried fish were carried out employing GMP and GIP in accordance with Codex Standards and Codes of Practices.

Under the project on research reactor utilization, R & D activities on neutron scattering included, among others, investigation of crystallographic and magnetic structure of iron-aluminum alloy by neutron diffraction, study of multi-phase ceramic samples to determine various phase distributions. Neutron Activation Analysis (NAA) included participation in the IAEA's AQCS Intercomparison Study on the determination of toxic and other trace elements in IAEA-390 set of algae materials; IAEA's AQCS Intercomparison Study on the determination of trace elements in environmental samples of Baltic sea and New York Harbor; determination of mercury and selenium concentration through radiochemical separation technique followed by Instrumental Neutron Activation Analysis(INAA); and determination of low level (ppb) arsenic content in water.

Production of radioactive isotope has been continued which are being supplied on a continuous basis to various Nuclear Medicine Centres and replacement for import. Construction of Glove Boxes for Mo/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.

Medical and Biological applications of nuclear and radiation techniques are being widely appreciated in Bangladesh. At present, fully operational Nuclear Medical Centres and one Institute of Nuclear Medicine in Bangladesh providing services, these NMC's and 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 included RIA for Hepatitis B Diagnosis. Under the project on Strengthening of Nuclear Medicine, BAEC has been conducting training of its different categories of nuclear medicine technicians.

### **Ladies and Gentlemen**

The objective of the project on Radiation Sterilization of Tissue Grafts 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. 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 orthopedic and dental patients.

The project on Fixation of Atmospheric Nitrogen 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 N isotopic technique. There were three varieties of each of the crops tested against single and mixed culture inoculants. Experiments on some other products are being conducted. Distinct beneficial effect of inoculants was observed in most of the demonstrations, indicating a great prospect of rhizobial bio-fertilizer technology in Bangladesh. The project has helped generate interest among the farmers on use of the bio-fertilizer 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.

### **Ladies and Gentleman**

The project "Maintenance Of Nuclear Instruments", 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.

Under the project "Energy And Nuclear Power Planning, 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.

The RCA Nuclear Information System Project activities 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 IAEA and other regional Counterparts.

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. The Nuclear Safety and Radiation Protection Rules, 1997, prepared by BAEC, has already been promulgated. A Project Concept Paper on Waste Processing and Storage Facility 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". 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.

**Mr. President**  
**Distinguished Delegates**  
**Ladies and Gentlemen**

Participation of Bangladesh in various RCA projects has immediately benefited the country in several ways as follows:

- 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.

Bangladesh wants to reiterate that it finds the RCA to be a 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.

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## **Country Statement of the People's Republic of China The Twenty-Sixth General Conference Meeting of Representatives of the RCA Member States**

1 October 1997, Vienna, Austria

### **Mr. Chairman, Distinguished Delegates, Ladies and Gentlemen.**

On behalf of the Chinese delegation I wish to extend our sincere congratulations to the Chairman of this twenty-sixth General Conference of the Representatives of the RCA Member States, held today 1st October 1997. I am convinced, that under your wise guidance and your able leadership this meeting will be successfully meet its objectives.

Overall the RCA has yet again had a successful year, this is the silver Jubilee Year, continuing to provide an effective and efficient vehicle for the peaceful application of nuclear science and technology in regional member states. I wish to recall that China has maintained its active participation in the RCA programmes since the beginning, and intends to remain the active member in the future. We do believe that through this regional cooperation the transfer of nuclear science and technology has been enhanced and more impact and effectiveness.

A brief description of activities in the various projects in China during 1997 and our suggestions and comments for future RCA activities are given in below:

### **I. UNDP/IAEA/RCA Industrial-Environmental Project**

#### **1. Tracer Technique Application**

The Regional Workshop on Tracer Technique for Oil Field Development was held in Dagang-Tianjin, 15 participants from RCA member states attained. Dagang Oil Field Company and China Institute of Atomic Energy were the host.

#### **2. Nucleonic Control System (NCS)**

The Regional Training Workshop on the application of NCS to paper Industry was held in Shanghai and Canton, 11-20 Nov. 1996.

The National Workshop on NCS Application in Cement Industry will be held in Beijing, 4th Quarter 1998, the Chinese Academy of Constructive Industry and the China Institute of Atomic Energy will be the host.

### 3. Radiation Processing

Radiation Crosslinking application in China is still impressive. The throughput of radiation crosslinking products will exceed one thousand million RMB Yuan in 1996 and in 1997. Radiation Crosslinked wire, cable and shrinkable materials are widely used in China, this is a matured technology.

China also actively participated all radiation sterilization and Radiation Vulcanization of Natural Rubber Latex RCA activities.

### Radiation Curing

The National Workshop on Radiation Curing was held in Zhang Jiajie, Hunan China from 21-24, Sept. 1997. More than two hundreds participants attained, 48 papers presented, 60% participants from industry, Ventures, including seven from foreign ventures, the rest (40%) from universities and institutes. Now there are more than 30 production lines of UV and EB used for paper, wood and electron circuit plates industries in China.

Some Special subject Workshops will be held in 1998:

A Wood products radiation curing workshop will be held in northeast China.

A printing circuit plate radiation curing workshop will be held in South China.

The 7th Rad tech Asia Meeting will be held in China, 1999.

### Radiation Engineering

Now there are more than sixty  $^{60}\text{Co}$   $\gamma$  facilities and 46 industrial EB accelerators has been in operation in China. The total installed capacities are 10 Mci  $^{60}\text{Co}$  and 2000 KW respectively.

The National Workshop on Economic Beneficial Operation of Gamma Facilities was held in Qingdao from 27-30 May 1996. The proceeding of this workshop has been published. This is a very successful workshop.

The National Workshop on Economic Beneficial Operation of EB Accelerators will be held in Zhengzhou from 21-26 October 1997. Some experts from France and Switzerland will give lectures.

The National Workshop on Regulation and Standards for Radiation Facilities will be held in 4th Quarter 1997 in Beijing.

The National Workshop on Medium and Small Size  $^{60}\text{Co}$  Gamme Facilities Application was held in Yangzhou, from 22-26 April 1997, 50 participants attained.

The National Workshop for EB Accelerator end-users was held from 19-22 June 1997 in Changshu.

The National Training Course for EB Accelerator Operators was held in China Institute of Atomic Energy.

The National Workshop on Quality and Standard of Radiation crosslinked Wire and Cable will be held 1998 in Shanghai, co-hosted by Radiation processing committee, China Isotope and Radiation Association and China Cable Industry Association.

The National Workshop on Radiation Processed Products Application will be held Sept. 1998 in Beijing, co-hosted by Radiation processing committee, China Isotope and Radiation Association and China Constructive Industry Association.

#### Radiation and Environment

The Regional Workshop on Radiation Treatment of Waste water and Drinking water is proposed held in 1997 in Shanghai, but be postponed to May 1998 in Shanghai, Shanghai University will be the host.

A Flue Gas EB Radiation Treatment Plant for removing Sulfur dioxide has been established in Chengdu, Sichuan, China. This is Japan-China bilateral cooperation product, IAEA also supported this project. The Japanese Ebara Company was the main investor.

#### 4. Non-Destructive Testing (NDT)

A Regional workshop on Application of Nuclear Techniques in NDT of pipelines and plant pipework is proposed in Beijing, September 1998.

#### 5. Nuclear Analytical Technique (NAT)

The 5th National symposium on Nuclear Chemistry and Radiochemistry was held in Beijing, in May 1997.

A new method using Neutron Activation Analysis for tracer elements in Geogas for the detection of hidden multimetallic ore deposit was developed recently, and good results has been achieved.

The 1998 International Conference on Nuclear Analytical Methods in Life Sciences (NAMLS) will be held in September 1998 in Beijing, hosted by the China Institute of Atomic Energy (CIAE).

The third National Symposium on Radio Analytical Chemistry will be held in August 1998, in Zhang Jiajie, Hunan, China.

## **II. Food and Agriculture**

In 1996, China had irradiated foods about 50,000 tonnes (to October, 45, 000 tonnes), the main products are garlic, pepper, dehydrated vegetables.

In 1997, China had irradiated foods more than 30,000 tonnes (up to august). The main products are garlic, pepper, dehydrated vegetables and health food.

The National Workshop on Food Irradiation Commercialization was held from 7-8 July 1997 in Beijing, hosted by Ministry of Health.

The Second RCM on Development of Safe, shelf-stable Food through high-dose irradiation processing will be held in May 1998, Beijing.

The National Workshop on Management of Food Irradiation Processing and Quality Control will be held in Chengdu, from 25-30 May 1998.

The National Training Course on Food Irradiation will be held in September 1998, in Beijing.

A Regional Workshop on Radiation Mutation Breeding will be held in August 1998, in Beijing. The Institute for Application of Atomic Energy in Agriculture (IAAE)/Chinese Academy of Agricultural Sciences will be the host.

Regarding the New Project proposal on Food and Agriculture, we proposed following thematic programme:

1. Food Irradiation
2. Mutation Breeding (two proposals).
3. Yak Improvement

4. Dairy cow and buffalo RIA & EIA.
5. Grain Legumes (RAS/5/021)
6. Agroforestry Systems (RAS/5/029)
7. Feed Supplementation and Animal Production Strategies (RAS/5/030)

The details see appendix. We hope after discussion, the new thematic programme on Food and Agriculture will be formulated.

### **III. Nuclear Medicine and Health care**

China support all the nuclear medicine and health care projects.

National Training Course on QA in Radiation Therapy was held in Beijing from 25 May to 6 June 1997.

RAS/6/027 Quality Assurance in Radiation Therapy Project Formulation Meeting was held in Beijing, from 9-12 June 1997. Hosted by Cancer Institute, Chinese Academy of Medical Sciences.

The National Training Course on Nuclear Medicine Technician's Training will be held in Shanghai and Wuhan, October and November 1997 respectively. In the third Quarter, 1998. This courses will be held in Beijing, Shanghai and Wuhan.

Expert Workshop on Diagnosis of Hepatitis B and C Infection by RIA was held from 3-7 March 1997 in Beijing.

Regional Training Workshop on Production of Therapeutic Radiopharmaceuticals was held in Beijing, from 22 Sept. -3 Oct. 1997.

The RCM on Diagnosis and Management of Patients with unexplained back pain using bone SPECT will be held 2-4 March 1998 in Shanghai.

### **IV. Radiation Protection**

Workshop to Review Waste Inventory, Waste Characteristics and Reference Site Candidates (RAS/4/016) was held in Shanghai from 7-9 July 1997. The experts visited Shanghai LILW pre-disposal site. For the non-power LILW, particular the waste radiation sources, the pre-disposal storage site is important for big city. China would like to do some training-demonstration activity for Asian Pacific Region.

The Regional Training Course on Radiation Monitoring in Large Areas in Emergency Situations will be held in Taiyuan from 11-15 May 1998. The China Institute for Radiation Protection (CIRP) will be the host.

#### **V. Energy and General Projects**

In China, the nuclear power projects are actively processed. Qinshan and Daya Bay NPPs are in operation very well. China was a member of Nuclear Information System project. China will do some contribution for IAEA RCA Home page. One Chinese fellow have been worked in Agency for this .

This year 1997 marks the Silver Jubilee of the RCA, now RCA is matured. In the next 25 year, We hope, RCA will become a respected Regional Resource Community (RRC) of nuclear science and technology; play a significant role; formulate and implement problem solving, end-user and high impact oriented programmes; use the resources of facilities, funds and manpower; better management, information network and collaborations. For the benefits of this region, for peace and socio-political stability, economic growth and industrialization, RCA should solve following problems:

Food & Nutrient Security and Food Safety, Health Care, Industrial Development, Environmental care, Nuclear Power and Nuclear Safety.

Regional Resource Unit (RRU) is very important for matured RCA. China will contribute her related institutes for RRU.

TCDC is a very important concept for RCA, China will contribute her experts, equipments, facilities, isotopes, RIA kits and many others for the benefits of regional member states.

So many projects need us to do, the Development of Finance Resource is very important, a broad, diverse base of funding is needed. Obtaining outside funding is one of key points. Bilateral, multilateral and commereial institutions should be considered. As a case history, China Chengdu flue gas EB treatment plant is a good example (Japan/ China cooperation)

China support all the good new project proposal. Particularly the project for market competitive high added value products, for problem solving, and for the benefits of end-users.

We support the UNDP/IAEA Joint industrial/Environment projects. We proposed a thematic food/agriculture programme. And also support the accelerator application, red tide and other project proposal.

China will continue to contribute towards these broad objectives as in the past. And I would like to reaffirm our continued strong support for the RCA projects.

## **COUNTRY STATEMENT - INDIA**

### **INTRODUCTION**

**India has been actively participating in several RCA activities of IAEA. Department of Atomic Energy has a vast mandate namely: building research reactors, R&D in the entire fuel cycle with the objective of production of safe and economic power from nuclear reactors, production of radioisotopes for applications in industry, medicine and agriculture, basic research in nuclear science and allied areas and R&D in the advanced technologies like lasers, accelerators, biotechnology, information technology and materials science. Self-reliance has been our motto since the inception and we have achieved to a large extent our objectives in all these areas. With the result that we are in a position to share our knowledge with the member states of the region. IAEA has always been supportive of our RCA activities; in fact on several occasions we have received special invitations to join some CRP or provide expert services or training facilities etc., for which we are thankful to the Agency.**

### **CO-ORDINATED RESEARCH PROJECTS (CRP)**

**India has been an active member in IAEA (RCA) CRPs. Our participation has been in a variety of disciplines like Reactor Engineering and Safety, Material Sciences, Isotope Application in Industry, Medicine & Agriculture, Radiation and Environmental Safety, Thorium Utilization, Bio Technology, Development of Nuclear Analytical Techniques for various applications.**

**Currently we are participating in over 50 Coordinated Research Programmes of the Agency. There were four research coordination meetings of various CRPs during the last one year period. Some of our major RCA programmes are given below.**

### **RESEARCH REACTOR UTILIZATION**

**We operate several research reactors at Trombay, Mumbai which include APSARA, our first swimming pool type research reactor built in 1956 with maximum rated power of 1 MW, a 40 MW research reactor CIRUS (1960) and the 100 MW research reactor DHRUVA (1985). These reactors have been used for a variety of research reactor utilization purposes like isotope production, neutron activation analysis, engineering experiments and neutron beam research in condensed matter physics. Production activities of radiopharmaceuticals and various industrial and technological applications of radioisotopes are carried out. The neutron beam research group of BARC is well established and well recognized community in the region.**

**In the recent years, the availability of the high flux ( $2 \times 10^{14}$  n/sq cm/s) Dhruva reactor, coupled with indigenously built sophisticated beam-line instruments, has considerably enhanced the scope of research reactor utilisation in neutron beam research at BARC. All the instruments at the Dhruva reactor are extensively used for a variety of studies in condensed matter physics.**

**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 emphasized 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.

India participated in the Experts Meeting for "National Programmes for Neutron Radiography" in 1996 at Serpong, Indonesia and Indian participant presented a talk on Neutron Radiography in India : An overview of NR methods, facilities and applications. We are in a position to provide expert assistance in the design and construction of beam instruments and peripherals. Our facilities can be made available for collaborative research for member countries through CRPs and IAEA.

Our sustained commitment to this national and international activity mainly arises because it has been our experience that an active research reactor programme provided right opportunity and environment for initiating a programme in nuclear based sciences, and has proved to be vital pre-requisite for a successful nuclear power programme.

#### **MEDICAL AND BIOLOGICAL APPLICATIONS**

In the vital area of Nuclear Medicine, we are participating in the following CRP RCA Projects.

a) Certification of QC and Preventive maintenance (Asia & Pacific) (1995-1997) :

The aim of the project is

**i) to continue to promote Q.C.of advanced nuclear medicine equipments in India.**

**ii) to identify and select nuclear medicine centres to participate in the inter-laboratory comparisons.**

**iii) to establish the appropriate methods of Q.C. & P.M.**

**Efforts are on to establish PC based communication with various nuclear medicine departments in India using modem and internet service in order to have remote dial-up QC and diagnostic station in RMC.**

**b) Evaluation of  $^{99m}\text{Tc}$ -HiG for infection inflammatory foci imaging :**

**The project was started from 15.12.96. The aim of the study was to find out ideal chelating (agent) ligand for labeling of HiG with  $^{99m}\text{Tc}$ . To make single labeling kit preparation and clinical evaluation of  $^{99m}\text{Tc}$ -HiG in patients having various inflammatory lesions. So far we have studied the evaluation of  $^{99m}\text{Tc}$ -HiG in animal model. The labeling of HiG with  $^{99m}\text{Tc}$  was done by using 2-mercaptoethanol reduction and Sn-MDP transchelating method.**

**The future studies includes the use of different commercially available HiG and different chelating ligands for libeling of HiG with  $^{99m}\text{Tc}$  to use in patients.**

**c) Comparison of therapeutic efficacy of  $^{32}\text{P}$  &  $^{89}\text{Sr}$  in relief of bone pain from skeletal metastases :**

**The aim of the treatment of the study was to provide an improved quality of life by palliative treatment (with  $^{32}\text{P}$  and  $^{89}\text{Sr}$ ) to patients with bone**

metastases who have their primary in prostate, breast or lung when other modes of therapy like Chemotherapy, external radiation therapy, analgesics etc. became ineffective in controlling the pain in the later stage of the disease.

Management of patients with advanced bone metastases and interactable bone pain is a challenging clinical problem and the availability of therapeutically effective bone seeking radiopharmaceutical like Strontium-89 and Metastron-89 have been found effective as a simple, safe and effective method for palliation of bone pain rather than cure of the disease. A group of 28 such patients were selected and categorized into two groups - one group for treatment with  $\text{Sr}^{89}$  and the other with  $^{89}\text{P}$ . The final results obtained were presented at the final RC Meeting on the above research project held at Slovenia - April 2-4, 1997.

d) IAEA - Coordinated Research Programme on validation of IBM PC interfacing with Gamma Camera to appropriate application software for data processing of clinical studies (1995-1997) :

With the advances in the computer technology, computers used in earlier versions of gamma cameras have become obsolete. These gamma cameras can be used more efficiently by interfacing them to the IBM personal computers. This not only requires the development of interface hardware but also the development of IBM PC software for quality control and clinical evaluation of imaging studies.

In the field of Radiation Oncology, Tata Memorial Hospital is actively involved in the following projects of Coordinated Research Programme (RCM) of IAEA:

**1. A study of CRP on "Modern Techniques in Brachytherapy with Special Reference to Developing Countries" is undergoing since December 1993 on "Radical Irradiation for Conservative Management of Early Breast Cancer and Role of Bio-effect Models : Contract No. 7676/RB".**

**2. A study of "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".**

#### **Radiation Sterilization of Tissue grafts (RAS/7/003)**

**a) Freeze dried, gamma-irradiated tissue grafts were prepared and utilized in a variety of clinical conditions in patients from hospitals all over the city.**

**b) A paper was presented on "The Role of a Tissue Bank in Clinical Practice" at a clinical meeting in the Tata Memorial Hospital.**

**c) A colour booklet produced by us, detailing the allografts produced by the Tata Memorial Hospital Tissue Bank and their clinical usefulness, has been mailed to members of the Association of Orthopaedic Surgeons of India and the Association of Dental Surgeons of India, practicing in Mumbai.**

**Work planned for the next two/three years :**

**1) Assist in the establishment of a Tissue Bank.**

**2) Deliver the IAEA curriculum and certification for tissue bank operators.**

**3) Conduct a clinical study in co-ordination with the IAEA on the evaluation of amnion as a biological wound dressing.**

- 4) Foster public awareness and acceptance of radiation sterilization of tissue grafts.
- 5) Conduct a workshop on Tissue Banking for potential local users of our allografts.
- 6) Arrange for Scientific visits to established Tissue Bank personnel in introducing changes to assume product quality excellence.

## **RADIOPHARMACEUTICALS**

### **Diagnosis of Hepatitis-B by Radioimmunoassay - RAS/6/18 :**

**Regional Centre for Radiopharmaceuticals, BRIT, Bangalore was one of the Expert Centres involved in the evaluation of Hepatitis-B kits and bulk reagents, procedures and in trouble shooting of problems.**

**As a sequel to RAS/6/18 a project on "RIA of Tumor Markers" is being taken up in 1997. This project utilizes the infrastructure setup in earlier RCA projects.**

**An IAEA Workshop on Brachy Therapy Sources and Application was held in 1997 as part of BRIT's activities.**

## **RADIATION PROTECTION INFRASTRUCTURE**

**The major achievements during 1997 are:**

### **1) Formulation of proposals for Phase-III Projects on Enhancement and Harmonization of Radiation Protection :**

**India has contributed significantly to the formulation of proposals for the next phase, Phase-III, 1998-2002. In view of significant contribution from India in the RCA activities of Phase I & II and the availability of**

**expertise in the field, RCA members expressed strong desire and agreed that India should organize four workshops at BARC during Phase-II; two workshops on Latest Recommendations, Concepts and Approach by ICRP & IAEA one during 1999 and the other during 2001, one workshop on Radiation Protection in Medical Exposure for Regulators and Hospitals staff including protection of patients, medical staff and public either during 1998 or 1999 and other workshop on for Environmental Radiation Monitoring either during 1998-2000. These workshops will be helpful to RCA member states in achieving the objectives of enhancement and harmonization of Radiation Protection.**

**2) Distant Learning in Radiation Protection :**

**RCA sponsored a project on developing a distant learning course in radiation protection for use in the Asia/Pacific region. The aim is to enable the users to acquire sufficient knowledge to work safely with sources of ionizing radiation by self learning at his place of working without and enable them to obtain relevant license for working with radiation. This is envisaged of significant value for users at remote and distant places especially in large countries, who are not able to attend the recognized courses of long duration.**

**3) Expert Meeting on External Dosimetry Intercomparison will be held from December 1 to 5, 1997 in BARC :**

## **RADIATION TECHNOLOGY**

### **a) DRINKING WATER TREATMENT**

**Realizing the immense potential of utilizing radiation technology in the environmental management, Isotope Division, BARC commissioned Asia's first sewage sludge irradiator (SHRI) in 1992 for treating 110 m<sup>3</sup> domestic sludge per day at Baroda. Since then, considerable experience has been gained in utilizing radiation technology for waste treatment on a large scale. Laboratory scale experiments have been successfully carried out at Isomed, BRIT for sterilization of water in packed pouches that can be beneficial to medical industry. However, no large scale studies have still been carried out on treatment of drinking water by radiation.**

**A pilot scale study utilizing the present 2-MeV electron beam accelerator will be conducted for the treatment of natural water and drinking water supply. Chemical and biological characteristics of the untreated as well as treated samples will be evaluated for standardization of the process.**

**A Meeting of (RCA) National Coordinators on "The use of isotopes and Radiation to strengthen Technology and Support Environmentally Sustainable Development" was held here in December 1996 and was attended by 16 Member States. We are planning to have a meeting of RCA National Coordinators for Radiation Technology here early next year.**

**b) UPGRADING OF CELLULOSIC AGROWASTES TO USEFUL PRODUCTS**

Earlier this year there was a proposal on the above programme. India is among the largest agriculture producers in the world. There is enormous scope for upgrading many agricultural wastes to useful products and thus help agriculturists in rural area to generate employment and human resources development.

The Cellulosic agricultural wastes like Sugercane bagasse, Groundnuts (peanuts) shells, Silk cocoon protein (chitin and chitosan), Rice and wheat chaff and Coconut shell are likely to be useful for developing radiation processing methods for upgradation.

Radiation processed biodegradable polymer composites containing agriculture waste products can also be produced. For example it is possible to create composite, biodegradable polymers by combining synthetic polymers like polyethylene and agro-wastes such as wheat and maize chaff.

Member countries like Bangladesh, Srilanka, Malaysia, Philippines may also be interested in these programmes.

**c) STERILE INSECT TECHNIQUES (SIT)**

The feasibility of use of Sterile Insect Technique (SIT) for the control of insect pests is well established. Modern concept of pest management involves contribution of several pest control strategies to achieve desirable level of pest management, a concept termed as Integrated Pest Management (IPM). Sterile Insect Technique (SIT) is not only eminently suitable for incorporation in an IPM strategy, but is also an ecofriendly approach. Further,

**this approach to pest control involves nuclear tools and techniques, and therefore research / developmental work in this field is relevant to IAEA's activity. Insects of Public Health Importance like Mosquito and insects of agricultural importance like Diamond back moth, Bullworms of cotton and Fruitflies could be taken up under SIT programme.**

**d) ISOTOPE HYDROLOGY**

**The isotope hydrology is today an essential tool to study water resources . In the Asia Pacific region, with extreme diversity in the climatic and hydro geological and geochemical conditions, isotope methods have even a more important role. IAEA could therefore expand its activities in these areas which are highly relevant to social benefits.**

**NUCLEAR INSTRUMENTATION**

**Gamma Camera to PC Interface Card (Anugami-S) :**

**IAEA had placed an order for 70 cards to be supplied to Latin American, African and Asian countries to upgrade old analog gamma cameras. 43 cards have been fabricated, tested and supplied. Rest of the cards will be supplied soon.**

**We participated in the following Expert Missions :**

**China : To evaluate extension of Anugami cards for SPECT upgradation, networking of gamma cameras and to prepare TECDOC on Upgradation of Gamma camera.**

**Philippines : To evaluate user feedback on EPC Expert System and Protection of Nuclear Medical Imaging Systems.**

**Slovenia : For software validation of Nuclear Image Processing Package developed by various countries.**

**Our Plan for 1997-99 in this field includes :**

- a) Fabrication, testing and supply of gamma camera to PC interface cards.**
- b) Design and evaluation of SPECT to PC interface.**
- c) Networking of Nuclear Imaging Systems for sharing resources and processing power.**

### **DESALINATION**

**Water desalination is another area of importance where IAEA could initiate major programmes in the Member State Countries. This is also an area where we have a lot of experience and can therefore contribute to IAEA's efforts. Desalination based on waste heat from reactors can be commercially viable. IAEA should view this as a high profile area and with the attendant social benefits, the Agency will stand to earn a name for itself.**

### **NON-DESTRUCTIVE EVALUATION**

**As part of our efforts to make available advanced NDT techniques to industries, the 14th WCNDT conference was conducted at New Delhi during December 8-13, 1996. 1500 participants including 500 from outside India participated in this conference where about 700 technical papers were presented. An exhibition of NDT equipments was also held. Indian Society for Non-Destructive Testing (ISNT) has constituted a board for certification**

and examination in NDT. Representatives from India participated in the IAEA seminar on "Testing of Concrete" held in Singapore. 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.

### **NUCLEAR INFORMATION SYSTEM**

India has been actively participating in this programme. India hosted an IAEA-RCA Workshop on International Nuclear Information System in 1995 and the response from RCA countries was excellent.

It is proposed to hold another IAEA-RCA Workshop for the benefit of RCA countries sometimes in 1998. The proposed IAEA/RCA workshop besides covering INIS input preparation and output product use, the participants will be exposed to the potential capabilities of E-mail and Internet for information dissemination and retrieval. Hence, it is also proposed to cover basic aspects of computerized information processing, computer networking, E-mail and Internet by having BARC and NCST. Other areas planned to cover are information retrieval from on-line database hosts like STN International, Knight-Ridder Information and also CD-ROM databases available in Library and Information Services Division. It is planned to cover patents and standards.

India has strongly supported the proposal to have a new IAEA/UNDP project under RCA on an information system to exchange information on all aspects of nuclear energy and on economic and environmental facets of fossil and other conventional sources of energy in order to achieve

**sustainable development.**

#### **RCA MEETINGS & SYMPOSIA:**

**One of the major activities of the Department within the scope of the RCA is organizing various meetings such as RCA National Co-ordinators Meetings, Research Co-ordination Meetings, Expert Advisory Group Meetings, Training Courses of short & long term durations and Regional Workshops.**

**In the last one year, 10 such meetings have been organized. Noteworthy among them were the Regional Training Course / Workshop on Preventive maintenance, Quality Control and Upgrading of Nuclear Medicine Instruments, Implementation of the IAEA Basic Safety Standards and International Symposium on Harmonisation of Health Related Environmental Measurements using Nuclear and Isotope Techniques where RCA members participated. One more Workshop on Personnel dosimetry inter-comparison is also planned for 1997.**

#### **TRAINING & FELLOWSHIPS**

**During 1997, training was provided to 8 IAEA Fellowship holders including scientific visits. They were from Zambia, Ethiopia, Sudan, Bangladesh, Sri Lanka, Rep. of Korea and Myanmar. The training provided were in Nuclear Medicine, Groundwater Hydrology, Nuclear Instrumentation, Electronics and Reactor Control, Radiation Processing, Radiation Sterilization, Radiometry and Dosimetry.**

## **CONCLUSION**

**Currently India has apart from the Country Coordinator, RCA National Coordinators in 16 disciplines, ranging from Energy and Nuclear Power Planning, Research Reactor Utilization to Radiation Technology. Of these 16, two are from an Aided Unit of DAE, Tata Memorial Hospital, which is India's foremost Cancer hospital and another Coordinator from International Crop Research Institute for the Semi-Arid Tropics, Hyderabad.**

**India hopes to further strengthen its ties with the Agency for Regional Cooperation Programmes and would be willing to extend our services to the Member States in the region on the nuclear fuel cycle, application of radiation & isotope technology in industry & medicine as well as in related areas, thus increasing the in-kind contribution.**

## **COUNTRY STATEMENT - INDONESIA**

AT THE 26<sup>th</sup> GENERAL CONFERENCE OF THE REPRESENTATIVE OF THE RCA  
MEMBER STATES .

Vienna, Austria, October 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 this 26<sup>th</sup> General Conference of the Representatives of the RCA Member States, held today. I am convinced that under your wise guidance and your able leadership, this Meeting will successfully meet its objectives.

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 that have been carried out in my country in the framework of the RCA programme.

### **1. Regional Industrial and Environmental Projects**

#### **1.1. Radiation Technology**

1.1.1. It has been recognized that UNDP/IAEA/RCA projects have made valuable contribution to the man power development and to the promotion of the application of the radiation technology in Indonesia. Therefore, BATAN will use every opportunity to send staff members to participate at various occasions of RTC, ITC, Workshop and Seminars on radiation technology and related matters.

- 1.1.2. 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  $\gamma$ -ray irradiation facility for Radiation Vulcanization of Natural Rubber Latex (RVNRL).
- 1.1.3. 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.
- 1.1.4. 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 sub-project on RVNRL, entitled "Indigenous Polymers and Agrowaste Treatment".
- 1.1.5. Regional Training Course on RVNRL was conducted at CAIR-Batan, Jakarta, 21-25 July 1997.

## **1.2 Non-Destructive Examination (NDE)**

- 1.2.1. BATAN has actively promoted the use NDE technology through seminars, workshops and training course for practitioners and decision makers.
- 1.2.2. For 1996/1997, The NDE programme in Indonesia has been concentrated mainly on training. The training programme was focused on the training of personnel for level I and II of RT, UT and Surface Methods.
- 1.2.3. A National Training Course on UT level III, has been conducted on 15 December 1996 - 3 January 1997. There were 25 local participants attended the course and 1 (one) expert from Australia (Mr. Roy Gilmore) was also invited to this course.
- 1.2.4. For the next activities BATAN proposes:
  - A National Training Course on Surface Method level III. This course will be held in October/November 1998. We expect that the Agency can provide 2 or more experts.

- A two-day National Seminar on Advanced NDT and Remaining Life Assessment. This seminar is scheduled to be held in November/December 1998. We expect that the Agency can provide 2 or more experts.

### **1.3. Tracer Industries and Nucleonic Control Systems.**

1.3.1. 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 performed (October 1996).

1.3.2 To determine 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 in this experiment (November 1996).

1.3.3. NEMS on Nuclear Techniques in Erosion and Sedimentation Jakarta, 2-5 December 1996. Twenty 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.

1.3.4. Four experiments of leakage problem at PUSRI (fertilizer plant) have been conducted in between December 1996 to January 1997. Two experiments were carried out at the ammonia converter and another two were carried out at the heat exchanger.

1.3.5. Level catalyst scanning has been carried out at the ammonia converter at PUSRI III.

1.3.6. In between January 1996 - August 1997, three experiments were carried out. These activities were:

- Flow pattern of the sediment at the harbour area and its vicinity at the oil harbour of PERTAMNINA, Balongan, West Java.
- Sediment movement at Surabaya Harbour, East Java.
- Sediment movement at Semarang Harbour, Central Java.

1.3.7. Two staffs (one from BATAN and another one from State Oil Company, PERTAMINA) attended Regional (RCA) Training Workshop on Tracer Technology in Oil Field Studies for Secondary and Tertiary Recoveries, Beijing, China, 16-24 June 1997.

#### **1.4. Nuclear Analytical Techniques.**

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.

1.4.2. A terminal review meeting was held in Jakarta on 17-17 July 1997 and attended by the delegation from the UNDP, IAEA, Australia, New Zealand, the Philippines, Vietnam and Indonesia. The objective of this meeting is to discuss the Terminal Report of the UNDP/RCA/IAEA Project on the Use of Isotopes and Radiation to Strengthened Technology and Support Environmental Sustainable Development.

1.4.3. By implementing Total Quality Management according to international standards, e.g. ISO-25 and ISO-9000, Nuclear Analytical Laboratories at the National Atomic Energy Agency improves its performance significantly. A two-day visit of IAEA expert mission (Prof. Tian Weizhi) in mid of November 1996 has guided and advised the local staffs on the practical implementation of ISO-25 standard.

1.4.4. Under fellowship programme of the UNDP/RCA/IAEA Sub Project Nuclear Analytical Techniques, BATAN received Ms. Luz V. Esguerra from Philippine Nuclear Research Institute (PNRI). She stay at Research Centre for Nuclear Techniques, Bandung for four months (February - June 1997) to carry out neutron activation analysis of airborne particulate matter.

1.4.5. BATAN is interested in participating Joint UNDP/RCA/IAEA Project on the Better Management of the Environment, Natural Resources and Industrial Growth Through Isotope and Radiation Technology: Sub Project on Urban Air Pollution (1997-1999).

BATAN also interested in hosting Training Workshop on Chemometrics and Advanced Statistical Techniques which will be held in the first quarter of 1998.

## **2. Medical and Biological Applications of Nuclear Techniques**

### **2.1 Radioimmunoassay for Hepatitis B Diagnosis**

2.1.1. Indonesia is one of the countries that has an indication of a high prevalence of Hepatitis B. Therefore, since 1992 Indonesia has been participating in the TC Project of Radio immunoassay for Hepatitis B Diagnosis (RAS/6/018). Indonesia 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). The products of Hepatitis B reagents produced by BATAN has been distributed to local participating laboratories for clinical studies.

2.1.2 This project will be extended to Hepatitis C in term of production of the reagents as well as clinical study.

2.1.3. The main future activities are nation-wide application of HBV and HCV RIA reagents and establishment of the preparation of HCV locally.

### **2.2 Radiation Sterilization of Biological Tissue Graft.**

2.2.1. Dissemination of information on donor selection criteria and demos on application of radiation sterilized bones grafts to several hospitals is being done 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.

2.2.2. IAEA Regional RCA Consultants Workshop on Total Quality System in Producing Radiation Sterilized Tissue Grafts in the Asia and Pacific Region has been carried out in Jakarta on 1 - 5 September 1997. This workshop was attended by 13 participants

from 11 countries and 5 observers from Indonesia. Four experts Ms. Carolyn Woodruff (Australia), Prof. Dr. Rudiger von Versen (Germany), and Dr. Hideo Tatsuzaki and Dr. Reyad Kamel (both from IAEA) were also participated in this workshop.

### **2.3. Nuclear Instrument Maintenance.**

2.3.1. 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.

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

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

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

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

### **3. Research Reactor Utilization and Energy and Nuclear Power Planning.**

#### **3.1. Research Reactor Utilization.**

3.1.1 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.

3.1.2. Some efforts have been made to increase the availability and reliability of irradiation and experimental facilities and to upgrade the manpower capability.

3.1.3. Establishing computer code system for design, analysis and operating of the reactor and its systems by 1997 to support safe and optimal operation and utilization were established.

### **3.2. Energy and Nuclear Power Planning.**

3.2.1. A national seminar for the decision makers on the benefits of nuclear power in the long run has been held on 19 - 20 August 1997.

3.2.2. Two BATAN staffs attended Workshop on Financing of NPP, Manila, 25 - 30 August 1997.

3.2.3. Two BATAN staffs have been selected to participate in the Training Workshop on WASP IV, which will be held at KAERI, Taejon, 13 - 24 October 1997.

3.2.4. The future activities should be focused on regional seminars/workshops and training mainly on: the identification of infrastructure needs in various countries of the region; 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 sittings.

## **4. Radiation Protection Projects.**

### **4.1. Radiation Protection Infrastructure.**

4.1.1. BATAN has involved in Strengthening of Radiation Protection Infrastructure Project (RAS/9/006) from the beginning.

- 4.1.2. BATAN has and will use the opportunities to send staff members to participate at various occasions of RTC, ITC, Workshop and Seminars on radiation protection and related matters.
- 4.1.3. A BATAN staff (Mr. Mulyono Hasyim) participated in Korean Emergency Response Exercise, ROK, 9-13 September 1996 as an observer.
- 4.1.4. Mr. Gatot Suhariyono participated in Regional (RCA) Training Workshop on Contamination Monitoring which was held at JAERI, Tokai, Japan, 21 - 25 October 1996.
- 4.1.5. Mr. M. Zainuddin participated in IAEA/RCA Regional Workshop on Distance Learning Project in Radiation Protection, which was held at ANSTO, Australia, 17 - 21 March 1997.
- 4.1.6. Mrs. Yanti Lusiyanti has been accepted to participate in the IAEA/RCA Training Course on Biological Dosimetry, which will be held in Japan, 29 September - 3 October 1997.
- 4.1.7. Project Formulation Meeting for phase 3 for RAS/9/018 has been held in Taejon, ROK, 24 - 28 February 1997. Due to unforeseen circumstances, Mr. A. Razak was unable to attend this meeting, Therefore, Indonesia was not represented in this meeting. However, the meeting offered Indonesia to be the host of the following activities:
- Workshop on Monitoring, Control and Disposal of Sources, to be held in 1998.
  - TC on Optimization of Collective Dose from Uses of Diagnostic Radiography, including QA System and Dose Assessment, to be held in 2001
  - Mid-term review Meeting, to be held in 2000.
- BATAN agree to be the host of those activities.

#### **4.2. Reference Asia Man**

4.2.1. Indonesia has been actively 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 Nausea 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 by government budget.

#### **5. International Nuclear Information System (INIS).**

5.1. The project RAS/0/019 will be finished in 1996. The next project will be started on 1997 for 5 years. Considering the important of this project, BATAN will joint it.

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

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JAPANESE COUNTRY STATEMENT

at

The 26th General Conference Meeting of the RCA

Vienna, 1 October 1997

Mr. Chairman, distinguished delegates, ladies and gentlemen,

On behalf of the Japanese delegation I should like to extend my warmest compliments to you on your appointment as Chairman of the 26th General Conference Meeting of the Representatives of RCA Member States. Japan will extend its fully cooperation to you for the success of the meeting.

I should like to take this opportunity to join the Chairman and all participants in celebrating the 25th Silver Jubilee Anniversary of the RCA and to express our appreciation to the IAEA and RCA Office for their service and efforts to facilitate RCA activities. It is sincerely hoped that the RCA will develop into a even more effective and efficient arrangement and serve as a viable model for other international/regional cooperative arrangements.

After 25 years, the RCA can be considered a matured arrangement. Japan has contributed substantially to RCA activities since it joined the RCA in 1978. Japan's total contribution to RCA to date amounts to US \$6,666,720. Member-States, however, should contribute more actively in terms of project conception, planning and implementation. The promotion of TCDC within the RCA is strongly encouraged in this regard. It is also strongly recommended

that RCA Member-States and the IAEA work together, based on agreed strategies, to seek collaboration and association with other international organisations, including UNDP. Such joint efforts with international organisations will surely expand the expertise upon which the RCA may draw and provide opportunities for a more solid financial basis for RCA activities.

At this critical time RCA Member-States should conduct their endeavors in a cost effective and efficient manner. Japan, like many other countries, is currently pursuing drastic reform of its financial structure with a view to the challenges of the 21st Century. In this connection, Member-States may be required to be resolute in deciding which existing projects must be streamlined.

#### Japanese Funded Projects

Japan has participated actively in and contributed to such main fields as "Industry and the Environment", "Human Health" and "Radiation Protection".

In the field of "Industry and the Environment", Japan has submitted new sub-project proposals to the IAEA for inclusion in the 1997/98 Technical Cooperation Programming Cycle. These proposals are (1) Harmonization of Qualification and Certification of Level 3 Non-Destructive Testing (NDT) Personnel, (2) NDT in Concrete Buildings and Bridges and (3) Training of Operation and Management Staff on Radiation Vulcanization of Natural Rubber Latex. These activities shall constitute a Japanese-led proposal for a

renewed project on Advanced Techniques for Industrial Applications which was originally introduced under the field of "Industry". Japan believes that the new project meets the present and future needs of the Member States concerned and will continue to enjoy the contribution of the IAEA and Member-States concerned.

With respect to the project, "Preparation for Disposal of LILW from Non-power Sources", I regret to note that Japan has had to withdraw from the project due to financial constraints.

In the field of "Human Health", initiated by a proposal from Japan, we will continue to extend as much support as possible to such projects as "Radiotherapy of Cancer" and "Nuclear Medicine". We are very pleased to note that the project on "Transfer of Technology for the Production of Co-60 Sources for Brachytherapy" will commence this year with the endorsement of last year's General Conference and the Beijing Working Group which met last May.

With regard to the field of "Radiation Protection", Japan will continue to support the "Strengthening of Radiation Protection Project" with a view to improving nuclear safety in RCA Member States. This has been an ideal and successful project in that most Member States are donors providing financial support and equipment.

Japan also remains prepared to contribute in practical terms to such sub-projects as (1) Intercomparison and calibration of personal dosimeters, (2) Intercomparison of radioactivity measurement of environmental samples, and (3) Complication of analytical, physiological, and metabolic

characteristics for a Reference Asia Man.

#### New Joint UNDP/RCA/IAEA Project

It is rather disappointing that the UNDP did not include the joint proposal from Malaysia and Japan on upgrading of cellulosic agro-wastes to useful products, which was reflected in the Project Formulation Format (PFF), in the New Joint UNDP/RCA/IAEA project. Japan <sup>and Malaysia</sup> is ready to consult with the IAEA ~~and Malaysia~~, if necessary, on the feasibility of carrying out the proposal as a project independent from the new Joint Project.

It is inevitable that the RCA will face new challenges and opportunities as it continues to grow. On this special occasion of the 25th Anniversary, RCA Member-States and the IAEA should tackle the challenges in a cooperative and constructive manner, and provide the RCA with new dynamism and strength.

Finally, Japan should like to express its sincere hope that the RCA will continue to broaden its expertise and sphere of cooperation for the further development of the Asia and Pacific Region.

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**Korea, Republic of**  
**Country Statement**  
**26th GCM of RCA Member States**  
**1 October 1997, VIC, Austria**

The Republic of Korea continues, as always, to believe that the RCA is one of the most effective tools to promote the practical applications of nuclear technology in the Region for improved quality of life as well as to provide quality products. Following this belief, the Republic of Korea has been actively participating in various RCA projects since its inception 25 years ago.

The RCA has given tremendous benefits to all its member states, including the ROK, through providing expert services, coordinated research programs, sponsorship of seminars and workshops, organizing working group meetings, and particularly through providing regional training courses.

The Republic of Korea pledges its firm commitment to intensely participate in all RCA endeavors in the coming 5 years and beyond.

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

**1.1 Tracer Technology and Nucleonic Control Systems**

The Korean National Trace Group (NTG), which was formed within the Korea Atomic Energy Research Institute has placed great

emphasis on the development of tracer development techniques. The group, with its expertise, is ready to share its experiences and new techniques with other member states in the Region.

An NTG member has been at Myanmar, Bangladesh and Sri Lanka to provide expert service in tracer technology, particularly in the area of setting up flow rigs for tracer experiments in November, December 1996 and May 1997, respectively. Consultations have also been made on tracer data analysis. The NTG will further focus on advanced tracer technology development for maximum use by the industry.

## **1.2 Non-destructive Testing and Evaluation**

In Korea, NDT and NDE technologies are widely used in various industrial sectors. Efforts for advanced technology development have been extensively made in the past and the benefits were significant. The Korea Atomic Energy Research Institute(KAERI) has been playing an pivotal role in the development of advanced technologies and in transferring those NDT and NDE technologies to local industries.

A recently concluded research agreement between the Agency and a local NDT company demonstrates the government's strong intention to promote NDT technologies among the local nuclear-related industries. This particular agreement is concerned with the development of protocols for corrosion and deposit determination in pipes by use of radiography.

Korean NDT/NDE experts are ready to share their experiences with RCA member states in every field of endeavor. Because of the importance of NDT/NDE techniques for practical industrial applications, it is most desirable to further support the project as envisaged under the RCA framework.

### 1.3 Radiation Technology

Research on the radiation treatment of pollutants such as flue gas and liquid waste has been actively carried out in Korea. Local companies have been continuously expressing their keen interest in radiation treatment technology and its practical applications. Further support from the UNDP/RCA is greatly needed so that advanced radiation treatment technologies can be developed and actively used by the industries.

### 1.4 Nuclear Analytical Techniques

The Republic of Korea wants to actively participate in the joint UNDP/RCA/IAEA project on the Better Management of the Environment, Natural Resources and Industrial Growth through Isotope and Radiation Technology when this project is defined and established.

In particular, the Republic of Korea eagerly hopes to participate in a new RCA/CRP on environmental monitoring using nuclear analytical techniques which will be implemented within the framework of a global coordinated research program on bio-monitoring of trace element air pollution.

## **2. Medical and Biological Application of Nuclear Technology**

### **2.2. Radiation Sterilization of Tissue Grafts(RAS/7/003)**

A tissue preparation room has been renovated at a local university (Dan Kuk University) with a full complement of equipment.

Studies are being carried out on demineralized bone powder in the basic cellular form. Animal experiments have also been conducted. A protocol regarding guidelines for human bone sampling, as well as for preparation of clinical use, has been outlined.

A cooperation is planned with a local Organ-donation Center to get human bones, tendons, ligaments and skin, etc. There are also plans to obtain human amniotic membranes from a local university hospital for burn treatment. Current plans call for the establishment of a central tissue bank in Korea in the near future for radiation tissue graft needs.

### **2.3 Nuclear Instruments Maintenance (RAS/4/008)**

A Regional Training Workshop on Quality Control of Multi-head Gamma Camera Systems was held August 26 through September 6, 1996 in Seoul. 15 participants from 8 RCA member states attended.

In 1997, necessary information is being collected from pilot hospitals on the maintenance status of nuclear medicine equipment. Technical advice on quality control and preventive maintenance

of nuclear medicine has been provided. Inter-hospital comparison of nuclear medicine work is also being carried out. The 2nd Research Coordination Meeting on Research and Certification of QC and Preventive Maintenance of Instruments in Nuclear Medicine Centers in Asia and the Pacific will be held October 13-15, 1997 in Seoul.

### **3. Agricultural Projects**

#### **3. 1 Food Irradiation Process Control and Acceptance (RAS/0/022)**

Korea has one commercial Co-60 irradiator, mainly used for food preservation and medical supply sterilization. It is planned that 2 more commercial irradiators (multi-purpose with a maximum capacity of 3M ci) will be built by local industries under the technical assistance of the Korea Atomic Energy Research Institute(KAERI) in 1998. Between 1996 to 1997, the nation's sole commercial irradiator has treated dried vegetables and spices for domestic consumption. Current government regulation allows for the irradiation of 18 kinds of food items.

A national seminar on the Safety of Irradiated Food, to be organized by KAERI in collaboration with the National Institute for Safety of Food and Drugs, will be held during November 24-27, 1997. Experts from the IAEA will give lectures.

### **4. Research Reactor and Energy-based General Project**

#### **4.1 Research Reactor Utilization (RAS/4/011)**

In 1997 and 1998, a regional training course on neutron radiography (2 weeks in Taejon, Korea) and a regional workshop on current techniques and applications of SANS(Malaysia) are planned.

It is noted that at the 1996 Bangkok NCM, requests were made to include the research reactor utilization project in the RCA 1999-2000 program for further implementation.

Korea will positively participate in the 1998 RCA program meetings and workshops when they are finalized.

#### **4.2 Energy and Nuclear Power Planning (RAS/0/023)**

Recently, some of the Southeast Asian countries expressed their interest in nuclear power programs. With regard to this, RAS/0/023 can contribute to the establishment of national energy policies of those member states with nuclear power intentions. Korea is ready to share its experience in nuclear planning and implementation activities with the member states in the region.

#### **4.3 Nuclear Information System (RAS/0/019)**

It is recognized that integrated parts of the project should include upgrading telecommunication capability and expert training. This project will promote quick information exchange between the member states.

#### 4.4. Nuclear Power Planning (RAS/0/021)

Korea has committed voluntary contributions to this Footnote A project(RAS/0/021) with \$200,000 in 1994.

In connection with the Footnote A project, a workshop on Effective Strategies for Nuclear Power Programs among RCA Countries was held in Korea from 12 to 16 June, 1995. Another workshop on the Infrastructure Requirements and Organizational Aspect of NPPs was held in Indonesia from 21 to 27 April in 1996.

An expert meeting on the Economics and Financial Aspects on Nuclear Power Program and Strategies for Localization, Standardization and Technology Transfer was also held under the project from 25 to 29 August in 1997 in the Philippines.

### 5. Radiation Protection

#### 5.1 Radiation Protection Infrastructure (RAS/9/016)

Korea hosted a third phase (1998-2002) Project Formulation Meeting of this project at Taejon during February 24-28, 1997 with the recommendation from both the NCM in Malaysia (1995) and the EAGM in Australia (1996). In the PFM, 15 RCA member countries participated. At the meeting, future action plans were discussed.

Korea will strongly support this RCA project and has plans to actively participate in it.

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**Country Statement of Malaysia  
Twenty Sixth General Conference Meeting  
of the  
Representative of RCA Member States  
1 October 1997**

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On behalf of the Malaysian delegation I would like to congratulate you, Mr. Chairman, on your election to the position of Chairman for the Twenty Sixth General Conference Meeting of Representatives of the RCA Member States. I believe that with your able leadership and guidance the meeting will be a successful one.

Based on our experience and the progress of projects under this Agreement, we are confident that this cooperation will continue to flourish in the future to the benefit of all its Members. This is reflected by Malaysia being one of the earliest member states to sign the RCA Extension Agreement this year.

A summary of activities carried out in 1997 as follows:

1. **Industrial and Environmental Project:**

**Non-Destructive Testing (NDT)**

MINT has established a group specializing in the application of NDT for nonmetallic materials. In 1996 a procedure for the inspection of concrete buildings and bridges was developed and used to provide inspection service to the construction industries in the country. In response to a new regulation requiring all gamma projectors in the country to be certified by an approved maintenance center, MINT has established a National Center for Gamma Projector Maintenance.

**Tracer Technology**

MINT has established a pool of specialist in the research and development as well as the applications of tracer and sealed source. The group has successfully developed the techniques known as TAFLOSS for analysing the integrity of storage tank floor and COLSCAN for external scanning of distillation columns. Both techniques are non-evasive inspection methods which are used for rapid diagnostic tools in petrochemical industry. The group has also successfully developed a prototype physical model of radiotracer technique in evaluating flowrate, residence time distribution, channelling and mixing characteristic which will be transferred to the local industries. Malaysia plans to host Regional Training Course on Nuclear Gauges in the Oil and Gas Industry in April 1998.

### **Radiation Vulcanisation of Natural Rubber Latex (RVNRL).**

The commissioning of RVNRL pilot plant in March 1996 had contributed a significant progress to the project. A total of an approximately 80 tons of RVNRL had been despatched to latex products industries in Malaysia and to 13 other countries worldwide. Locally, industrial scale productions of medical gloves and toy balloons had successfully being carried out. These achievement had initiated an aggressive RVNRL marketing activities jointly done by MINT and local industries. Current research activities are focused on improving the mechanical properties of the products and the clinical evaluations of RVNRL products.

MINT had sent a lecturer and two participants for the Regional Training Course on Quality Control of RVNRL held in BATAN, Indonesia from 21 - 25 July 1997.

### **Nuclear Analytical Technique**

A study on the 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.

### **Measurement of Marine Contamination and Transport**

MINT in collaboration with other research organizations such as the Department of Environment, National University, Department of Marine Sciences and Chemistry, Department of Fisheries, Agricultural University and Fisheries Research Institute has successfully conducted a study on marine pollution and transport phenomena. To date sampling of marine sediment along the Straits of Malacca has been completed. Pollutants such as petroleum hydrocarbons and chlorinated compounds and other pesticides residue were ascertained and a technique for sedimentary layer dating was developed.

## **2. Medical and Biological Applications of Nuclear Techniques**

### **Radiation Sterilization of Tissue Grafts**

Malaysia participated in the Regional Workshop on Implementation of Total Quality System in Producing Radiation Sterilised Tissue Grafts for Safe Clinical Use held in Jakarta from 1 - 5 September 1997. The two tissue banks namely the national Tissue Bank located in Science University of Malaysia (USM) and the research Tissue Bank at the Malaysian Institute for Nuclear Technology Research (MINT) will be audited internally with the assistance of IAEA expert by the end of 1997.

### **Strengthening Nuclear Medicine in RCA Countries**

Malaysia has benefited from participating in a "Pilot Project in Distance Assisted Training Programme for Nuclear Medicine Technologist". Malaysia hopes that this project will become a regular training programme for technologists in the region. It is noted that this pilot project does not include SPECT which is one of the most important aspects in nuclear imaging.

### **Maintenance of Nuclear Instrument**

All nuclear instrument in the country are sent to MINT for preventive maintenance. Currently, efforts are being made to promote quality control for nuclear medicine instruments. A Nuclear Medicine Society was established through the joint efforts of MINT, IAEA and various nuclear medicine centres in Malaysia with the objective to better coordinate and facilitate the Nuclear Medicine Programme in Malaysia.

### **RIA of Tumor Markers for Detection and Management of Cancer**

Malaysia participated in the National Coordinator Meeting on Radioimmunoassay of Tumor Markers for Detection and Management of Cancer held in Colombo from 25 - 30 May 1997. In addition Malaysia participated also in the **Expert Advisory Group Meeting on Development of Sectoral for Nuclear Medicine in Health Care in Asia Pacific** held in Jakarta from 1 - 5 September 1997.

## **3. Agriculture Projects**

### **Public acceptance and trade in irradiated food**

Malaysia hosted the Second Research Coordination Meeting of the CRP on Public Acceptance and Trade Development in Irradiated Food in Asia and the "Pacific on 25 - 29 August 1997

## **4. Radiation Protection**

### **Strengthening of Radiation Protection Infrastructure Project**

Malaysia has actively participated in personnel training and laboratory intercomparison programmes and benefited in the form of upgrading skills and competency of personnel and upgrading capability of laboratories. Malaysia will Continue participate in future activities in order to further strengthen radiation protection programmes in the country. Malaysia will host the Regional Training, Course on Radioactive Waste Management on 29 Sept. - 18 Oct. 1997.

5. **Energy-Based Project**

**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 modelling aspect of the IAEA released WASP 111/IV electricity generation planning package.

Finally, the Malaysian delegation would like to reiterate our continuous participation in RCA activities and appreciation to the IAEA, donors and all member states for the successful implementation of RCA programme.

Country Statement of the Union of Myanmar  
at the  
Twenty-Sixth General Conference Meeting of Representatives of the  
RCA Member states  
October , 1997, Vienna, Austria.

Myanmar hosted the 19th Working Group Meeting of (Meeting of Representatives) RCA in Yangon from March 10 to 14, 1997. Along with the meeting, the Silver Jubilee of RCA was celebrated. Part of the Celebrations include an exhibition on "Nuclear Science and Technology Applications" highlighting RCA activities and the role IAEA. The meeting and the Silver jubilee events were attended by representatives of sixteen member states. From the Myanmar side, Ministers, Deputy Ministers, Directors-General and prominent people from education, science and industry were present. The event in general, and the exhibition in particular, gave publicity and awareness in the role of nuclear science and technology. For the first time, too, TV and press reported on the RCA meeting. It generated keen public awareness of the activities of RCA and IAEA.

A brief presentation about our IAEA and RCA related activities during 1996-97 are:

1. Industrial and Environmental Projects

1.1 Non-Destructive Testing

The use of NDT has been actively promoted through seminars, workshops and training courses. National Training Course on Non-Destructive Radiographic Testing was held last August by the help of IAEA experts from Malaysia under the NDT project. We are now able to promote NDT applications in various areas. Non destructive Testing service is now provided by NDT group at MSTRD. However, it is necessary to improve and to become a competent organization in the field of NDT. Cooperation with Malaysia (MINT) is progressing. Last August a national seminar for promoting NDT was held, with Drs M. Azali and I. Nassir of Malaysia as main speakers; attendance and interest from industry was impressive.

1.2 Tracer Technology and Nucleonic Control System

Gamma-ray transmission scanning has been applied to investigate the distillation performance of two columns from Thanlyin refinery in December 1996 by the supervision of IAEA expert Dr. Siripone from Thailand under project RAS/8/073. It was a good demonstration and gave basic training for Myanmar technicians. However, they would need more experience and on-job training to be competent.

1.3 Radiation Technology

Studies on Radiation effects on natural polymer materials, such as to cashew nut shell liquid (CNSL), rubber, wood, bamboo, etc. are in progress using irradiation in the small irradiator which has been in use for mutation breeding in Myanmar Agriculture Services. Physical properties such as surface characteristics, hardness, impact, strength, water absorption, etc. are studied after the natural polymers are irradiated. Some interesting results are obtained with CNSL treated timber.

#### 1.4 Nuclear Analytical Techniques (NAT)

The research contract "Air pollution Studies in Myanmar by nuclear related analytical techniques" is continued. New research contract entitled "Biomonitoring of Air Pollution through trace element analysis" is proposed to the IAEA as new research contract.

#### 2. Medical and Biological Application of Nuclear Techniques

2.1 The TC project "RIA Reagent for Neonatal Hypothyroid Screening" is being carried out as a joint project between Department of Medical Research and Yangon General Hospital. The Department of Medical Research is also running TC project "Nuclear Techniques in Diagnosis of Tuberculosis" with the objective to establish and transfer PCR-linked radioisotope technology for the early diagnosis of tuberculosis. In addition the DMR is performing a TC project "production of in house Reagents for Radio-immunoassay".

#### 2.3 Tissue Bank Project

The Agency has awarded TC project "reactivation and upgrading of Tissue Bank with the objective : to assist in renovation and upgrading of the infrastructure of the Myanmar Tissue Bank. With the resources available it is doing fairly well. There is a need for a new irradiator with sufficient activity, as well as upgrading of buildings etc by the counterpart institute.

#### 2.4 Nuclear Instruments Maintenance

The Agency has provided fellowships and equipments under TC project "Network for Repair and Maintenance of Nuclear Instruments" to upgrade the Nuclear Electronics Laboratory and establish a national network for repair of maintenance of nuclear instruments. Nuclear equipments from Department of Atomic Energy and various Universities/institutions have been repaired by the recipient institute, Department of Fine Instrument, MSTRD.

#### 3. Agricultural Projects

3.1 Project on Mutation proceeding in Grain legumes is continuing.

#### 3.2 Hydrology

The application of Nuclear Techniques in hydrology and management of water resources is a new field for Myanmar. Few participants got opportunity to attend IAEA and RCA training courses. There is still a need to get started in this area.

#### 3.3 Food Irradiation

Work in this area is constrained by the available irradiator.

#### 4. Reactor and Energy

4.1 Myanmar does not have a nuclear power program or a research reactor yet. However, in preparation for the early twentieth century, education and training are just started in 1997.

#### 4.2 Nuclear Information System

Myanmar needs to be linked to nuclear information network in RCA member countries.

Electronic networking and outreach is now particularly important for Myanmar as no other ways of getting information are very limited. Concerted efforts by Ministry of Science and Technology to conduct post-graduate courses in Science and Engineering disciplines would certainly benefit from this project.

#### 5. Radiation Protection

Atomic Energy Law which has been prepared with the help of IAEA expert missions, is expected to come out in the near future. IAEA Model project "Establishment of Radiation Protection and Waste Management Infrastructure" (1997-2000) is progressing according to work-plan except in the case of fellowship training nominations.

#### 6. Need for a Multipurpose Irradiation Facility

It is necessary to have a multi-purpose irradiation facility in Myanmar for applications in various areas. The IAEA mission for feasibility study of a multipurpose Irradiator has already completed by Dr. K. Zaman of Malaysia and it is hoped that the Agency will pursue the prospects further and that the RCA will have an interest in this case.

#### 7. Conclusion

Finally, Myanmar delegation is very pleased to report that the formation of a new and separate "Department of Atomic Energy" has been approved very recently and that the organization of the new Directorate is in progress.

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## **COUNTRY STATEMENT**

### **NEW ZEALAND**

#### **The 26<sup>th</sup> RCA General Conference Meeting**

**1 October 1997, Vienna**

Mr Chairman, distinguished delegates, ladies and gentlemen

The New Zealand delegation congratulates you, Mr Chairman, on your election to chair this important meeting. A highlight of the past year was the Working Group Meeting held in Myanmar which was notable for the ceremonies commemorating the 25<sup>th</sup> anniversary of RCA and the friendship and hospitality of the host country. This meeting signals the start of the next quarter of a century of RCA progress and several challenges must be met to ensure a good start to this new era.

**Activities** - New Zealand has been less active within RCA during the past year than in the previous two years. This has been caused mainly by the ending of the Joint UNDP/IAEA/RCA project and uncertainty about funding for a new project. The Joint Project contained the science activities of most interest to New Zealand's lead agency in RCA matters, the Institute of Geological and Nuclear Sciences (GNS).

New Zealand was proud to organise, host and provide experts and local costs for a Regional Training Workshop on Nuclear Methods in Monitoring Wear and Corrosion in Industry during May 1997. Twelve participants from ten developing countries were informed about thin layer activation techniques and shown examples of the use of the methods at industrial sites.

An expert was supplied to assist in a Regional Training Workshop on Nucleonic Control Systems in the Paper Industry held in Shanghai, Peoples Republic of China, in November 1996. In the same month a scientist from GNS attended the EAGM meetings in Hyderabad, India on Applications of Chemometric and Advanced Statistical Techniques in Data Evaluation.

We remain involved with the sub-project on Nuclear Information Systems but our National Project Coordinator left our service during the year, and the new appointee was unable to attend the NCM meeting.

In the area of Radiation Protection, New Zealand experts contributed to a Project Review on Distance Learning (Australia, March 1997) and to a Training Course on Basic Safety Standards (India, November 1996).

It is a cause for regret that New Zealand is still unable to identify local personnel and RCA activities that allow a fuller participation in Thematic Programmes in Health Care. We wish to assure RCA that we remain mindful of the importance of this programme.

**Future Activities** - New Zealand is pleased that UNDP support has been secured for the period 1997 - 99. We intend to be involved in all activities within the new project to the fullest extent possible. Although the total funding provided was less than had been hoped, it is still sufficient to carry out an effective and influential programme. Member States are urged to ensure that activities are commenced as soon as possible because the delay in the announcement of funding decisions has left little time to demonstrate progress before further funding must be sought.

**Management Issues** - This has been a difficult year for the management and implementation of RCA activities. It is hoped that disruptions will soon be behind us, and that we can move forward into the next quarter century with confidence.

Progress has been made on several important issues. Eleven of the twelve recommendations arising from the review of the management structure have been agreed and New Zealand believes that these will lead to significant advantages to RCA. New Zealand is also supportive of the one outstanding recommendation, that of a senior representative of RCA to be stationed eventually in the region. We hope that this meeting will continue to make progress on the implementation of the recommendations and in identifying and resolving outstanding issues.

**Financial issue** - New Zealand remains committed to providing funded contributions to RCA activities at a level of about US\$30 - 40,000 p.a. In the past year a problem has been identified in the operation of the existing MoU that controls the use of New Zealand's extra-budgetary contribution. This MoU is between the Agency and GNS, the New Zealand institute that supplies the funding.

New Zealand is pleased to notify RCA Member States that a new MoU has now been agreed that should satisfy the rules imposed on the Agency and GNS by their respective Boards. However the solution involves keeping the money outside the Agency financial system. Therefore, it appears that the New Zealand contribution will be designated an in-kind contribution in the future. It is regretted that our contribution may no longer be considered as a part of co-financing when dealing with outside Agencies such as UNDP.

**RCA Extension** - New Zealand supports in principle a further extension to the RCA Agreement. The formal legal requirements necessary within New Zealand to endorse the extension are underway.

**PAKISTAN**  
**COUNTRY STATEMENT FOR TWENTY SIXTH RCA**  
**GENERAL CONFERENCE MEETING**  
**VIENNA, 1 OCTOBER, 1997**

Mr. Chairman, distinguished delegates, ladies and gentlemen,

The delegation of Pakistan takes this opportunity to congratulate you on your election as the Chairman of the 26th RCA, GC Meeting. We are confident that the Meeting will have valuable outcome under your able guidance. Our commendations are also due to the previous Chairman of the 25th RCA General Conference Meeting under whose leadership the last Meeting achieved high standards of success.

Mr. Chairman my delegation also feels that RCA has been continuing to be an effective and well respected forum for the South Asian and Pacific Region countries for the promotion of nuclear technology in peaceful areas of their economic development through the mechanism of joint projects and through the spirit of TCDC. The RCA mechanism has forged a unity among all its seventeen member states for steering ahead the scientific and technical endeavours for their common benefits. Pakistan looks forward to the positive outcome from further strengthening the working of the RCA through the proposed restructuring of its management.

Mr. Chairman Pakistan would like to place on record its deep appreciation and joy of sharing with other fellow member states the achievements RCA has made during the past 25 years and for which it is so deservingly and rightly celebrating its silver jubilee this year.

May I recall that Pakistan has actively participated in almost all activities of the RCA since 1974 and will maintain its active contributions in the future RCA programmes. The summary of activities carried out in Pakistan during September, 1996 to August, 1997 is as follows:-

## **1. Industrial Projects**

Pakistan has effectively benefitted through the previous joint UNDP/IAEA/RCA Industrial Projects. We have taken active interest and have made positive contributions in the formulation of the new Industrial Project during the last year. Recognizing the importance of timely funding by the UNDP to commence the new Industrial Project and on the request of the Agency, Pakistan has officially taken up the matter at the UNDP's appropriate levels. We are glad that our efforts, alongwith these of the other member states have resulted in some success and the hope to start the Industrial Project soon has become a near reality

### **1.1. Non-Destructive Evaluation**

During the projected period, the National Centre for Non-destructive Testing (NCNDT) of PAEC has gained the confidence of the local industry by providing technical field support by generating the much needed trained and certified manpower in various techniques of NDT. Pakistani industry has started showing interest on the improved product quality and has developed quality control departments utilizing the various NDT methods. During the period under report the NCNDT has offered 20 training courses in various NDT methods out of which 3 were on non-certification topics like NDT Appreciation Course for Managers, Interpretation of Radiographs and Basic Course on Acoustic Emission. Out of a total of 207 participants 95 were certified.

NCNDT, apart from training and certification activity also offers inspection and testing services to the local industry. During the reported period NCNDT undertook and successfully completed inspection and testing jobs like tension tests, bend tests, hydrostatic and flattening tests, fracture mechanics analysis, ultrasonic testing, magnetic particle testing, radiographic testing and similar other works for a fertilizer company, gas company, electric power authority and water supply project. NCNDT has also continued to publish a quarterly NDT Newsletter that is circulated to over 300 NDT related organizations and the personnel throughout the country. To strengthen the objectives of the project further the Pakistan Society for NDT which was formed in January 1996 is functioning effectively. The present number of its life members is over 50.

### **1.2 Tracer Technology & Nucleonic Control Systems**

With the growing awareness of potential of nuclear techniques, several private and public sector enterprises are approaching PINSTECH, Islamabad for industrial process investigation and trouble-shooting. Use of tracer techniques is being made in Pakistan at a good pace. The following studies have been undertaken during the reporting period.

### **1.2.1 Determination of Density Profile of a Refinery Distillation Tower**

Gamma Ray Scanning of a Crude Distillation Tower at a refinery was done by employing gamma ray absorption technique. Analysis of the density profile revealed that a part of a tray was damaged and another tray was displaced downward in the upper portion of the tower. It also indicated high vapour densities and tray overloading in this region.

### **1.2.2 Measurement of Level of Catalyst in a Closed Vessel**

A fertilizer plant was facing accumulation of a catalyst in its ammonia service vessel which was escaping due to damage of a huge catalyst basket in a adjacent reactor. Gamma ray absorption technique was employed to determine this catalyst level. The catalyst level was found to be in the lower portion of the service vessel.

### **1.2.3 Leakage Investigation in Plateforming Combined Feed Exchanger in a Refinery.**

The problem of contamination of the finished product with the raw input i.e. mixture of hydrogen and naphtha, in the Plateforming Combined Feed Exchanger system in a refinery was studied. The system consists of furnaces, reactors and a 25 meter high heat exchanger, etc. Tests undertaken by the plant operators and maintainors on the heat exchanger did not help in arriving at a definite conclusion. The problem was referred to the NTG at PINSTECH. Bromine-82 in the form of Paradibromo benzene was used as a tracer and the leak in the system was detected.

### **1.2.4 National Executive Management Seminar on the Application of Nuclear Techniques in Mining and Processing Industry**

The main purpose of the seminar was to provide a forum for discussion on different aspects of radiation and isotope applications in the mining and ore processing industry, especially in the newly flourishing coal mining and processing industry with special emphasis on power production. More than thirty executives and officials from national industrial sector, technological development institutes and universities participated in this seminar held at NCNDT, Islamabad from 3-5 December, 1996. The seminar mainly comprised lectures and panel discussions on industrial process investigation and control, in addition to basic principles and general applications. There were six technical sessions covering Mining & Exploration, Process Investigation, Site Evaluation Studies, Analytical Techniques, Radiological Safety Aspects and Cost Economics of Nuclear Techniques in Industry. Practical situations and specific industrial problems as presented by participants were also discussed.

### **1.3 Radiation Technology**

#### **1.3.1 Imparting of Transparency to Polypropylene for Fabrication of Medical Disposable Syringes**

Irradiation of medical sterliable goods faces the problem of decrease in transparency in the irradiated polypropylene. Introduction of nucleating agents during processing results in lowering of haze value in samples when compared to those not having the additives. This may be attributed to an early nucleation, resulting in reduction of size of spherulites. Rectification of the problem is likely to promote radiation sterilization technique to pharmaceutical industry. Keeping this in view, a study has been carried out with copolymers of PP with 6 % ethylene with nucleating agent p-(t-butyl) benzoic aluminum.

#### **1.3.2 Fabrication of Insulation for Radiation Resistant and Fire Retardant Thin Wire**

Radiation Technology Laboratory at PINSTECH, Islamabad is developing radiation resistant and fire retardant insulation material using a new fire retardant FR-1033. The performance of newly developed formulation particularly with reference to its fire retardancy is being evaluated.

#### **1.3.3 Grafting of Fire Retardant on the PE Base Formulation for Wire and Cable Insulation**

Work has been initiated on radiation induced grafting of FR-1033 to a PE based formulation for wire and cable formulation. The initial results indicate a low grafting yield. R&D for optimization of experimental parameters for a better grafting yield and characterization of grafted material in terms of gel contents, limited oxygen index and mechanical properties is underway.

### **1.4. Nuclear Analytical Techniques**

#### **1.4.1 Environmental Studies**

IAEA Research Contract Monitoring of Pollutants in Environmental Media using Nuclear and Related Analytical Techniques was renewed by IAEA and experimental work remained in progress throughout the year. Air samples were collected from industrial area of Islamabad, from adjoining residential areas as well as from low pollution rural sites during different seasons. Soil from same locations was also sampled. Analysis of air filters has been initiated using NAA. Initial analysis of soil samples was performed using AES. The National Coordinator for Nuclear Analytical Techniques Project participated in the Third National Co-ordinators Meeting held at Beijing, Peoples Republic of China from 2-6 September, 1996.

## **2. Medical Projects**

### **2.1 Radioimmunoassay for Hepatitis B Markers**

Technology transfer for local production of IRMA Reagents for Hbs Ag and Anti Hbs Ag markers for HB virus has been achieved at the Institute of Nuclear Medicine and Oncology, Lahore (INMOL). The unit established at INMOL is capable to produce and supply RIA reagents for these two markers as and when required to users within the country and to the member states. The technology developed is sustainable. Prevalence of HBs Ag infection evaluated among the high risk groups was 1) Blood Donors 6.4% 2) Pregnant mothers 2.3%. 3) Cirrhotics 13.3% Hepatocellular carcinoma 28.5% subjects and 4) Hospital staff 5%. Overall progress in the project was discussed during the last meeting of the national coordinators of the project held in Beijing 3-7 March, 1997.

### **2.2 Radioimmunoassay of Tumour Markers for Diagnosis of Cancer**

The coordinator of the above project participated in the project formulation first meeting of the national coordinators held at Colombo, Sri Lanka 23 to 27 June, 1997. During this meeting the project work plan was discussed. A proposal of the participating national coordinators to hold first training course for this project at INMOL, Lahore was discussed and agreed during the meeting.

### **2.3 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 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 a PC can be used for image formation and reconstruction in conjunction with the PIP software. This is a major break through because it makes one 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.

Such interfacing cards are still needed for the remaining institutes so as to improve the image quality from existing Gamma Cameras available there. The quality control and certification is also being assured in these Centres/Institutes.

#### **2.4 Radiation Sterilization of Tissue Grafts**

Freeze-dried radiation sterilized human amniotic membranes are being produced continuously. 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.

#### **2.5 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 training of the basic subject involved in the nuclear medicine procedures. 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**

It has been established that preservation of food by gamma radiation is technically feasible and economically viable in the prevailing climatic and economic conditions in Pakistan. Acceptance of irradiated food by the consumers is of great importance in the successful commercialization of radiation technology. In order to educate the consumers, the programme for dissemination of information regarding food irradiation was stepped up. A number of lectures/seminars on the subject were delivered in the national research institutions, postgraduate colleges and agricultural universities in the country. Besides, lectures were delivered to the scientists attending various international courses.

A number of food processing industries were visited and meetings were held with the officials to discuss the potential, advantages and economics of food preservation by radiation. The food industry is interested in the radiation technology. Some foods for example chillies, peppers and other condiments are being processed on large scale in Pakistan Radiation Services (PARAS) at Lahore. The commercial radiation of food has been followed after approval of the Food Irradiation Regulations, comprising all the foods in seven classes, in 1996 by the competent authority. The Pakistan Agricultural Storage and Supply Corp. (PASCO), is responsible for bulk storage of various food commodities and maintaining uniform supply to the markets. Meetings were arranged with the officials of PASCO, who were briefed about the economics and advantages of applying gamma radiation for the preservation of various food products on commercial scale. This organization is greatly interested to apply radiation for the preservation of their stored products.

#### 4. **Energy Based Projects**

##### **Energy and Nuclear Power Planning**

RCA activities in the field of nuclear power planning have been very useful for developing local capabilities for planning and implementation of nuclear power projects in RCA member states. PAEC has also benefited from these activities and has developed local expertise in this field. The Programme/Action Plan recommended by the Expert Regional Workshop on Effective Strategies for Nuclear Power Planning in RCA countries held at Taejon, Republic of Korea, 12-16 June 1995, is being implemented satisfactorily. Under this project, one workshop in Korea and a training course in Thailand were conducted in 1996, from which PAEC took benefit by sending its teams. In view of the usefulness of these activities, it is recommended that the remaining activities of the Action Plan be implemented, besides arranging additional training courses on various aspects of nuclear power planning.

#### 5. **Radiation Protection Project**

RCA/IAEA project Strengthening of Radiation Protection Infrastructure is currently in progress and will be complete by end of 1997. Meanwhile, during the period between September, 1996 to August 1997, the task group of five RCA National Coordinators constituted for the review of the phase-II programme and to prepare a draft proposal for the extension of phase-II (1993-1997) to phase-III (1998-2002) covering all left over activities in the field of radiation protection during phase-II had submitted its proposal. The same was discussed during project formulation meeting of all RCA/IAEA national coordinators meeting held at Taejon, Republic of Korea from 24-28 February 1997. The participants of the meeting extensively reviewed the entire programme and showed their satisfaction on the completion of phase-II programme and strongly agreed for its extension to phase-III.

In addition to above two parallel programmes given below have also been introduced in RCA/IAEA member states:-

- i. Interregional Model Project on Upgrading Radiation and waste Safety Infrastructure in West and East Asia and the Pacific.
- ii. Coordinated Research Project on Environmental Monitoring in RCA/IAEA Member States.

PAEC has already agreed to actively participate in these two projects and initial work has been started with the collaboration of PAEC Medical and Research Centres. PAEC has also offered to provide expert services in various fields under the interregional model project.

PAEC scientists have participated in seminars, workshops and symposium held under RAS/9/018 in the field of radiation protection during the subject period.

The national coordinator from Pakistan participated in project formulation meeting held in Taejon, Republic of Korea from 24-28 February, 1997.

## **7. Other Comments**

Pakistan believes that RCA objectives can be achieved in a better way if member states generously allow their training facilities and institutions to be utilised by scientists and engineers from other member states. With this conviction, PAEC is continuing to provide training facilities to the scientists of the Region at NIAB, Faisalabad, PINSTECH, Islamabad and at some of its renowned nuclear medical institutes in the country. Pakistan would also be willing to send its experts to other countries on short term basis to help foster the concept of TCDC in the Region.

In conclusion, Pakistan wishes to express its satisfaction on the implementation of various RCA activities in the Region during the past year. Pakistan would continue to support actively the activities and programmes of the RCA in co-operation with the IAEA. We are confident that RCA's programme will play an important role in promoting the applications of peaceful nuclear technologies in the member states and that Pakistan will extend its full cooperation to that end.

  
**HASIBULLAH**  
RCA National Co-ordinator  
from Pakistan

**PHILIPPINE COUNTRY STATEMENT**  
**26<sup>TH</sup> RCA GENERAL CONFERENCE MEETING**  
**Vienna, Austria**  
**01 October 1997**

On behalf of the Philippine Government, I wish to congratulate the delegate from Myanmar for chairing this RCA General Conference Meeting.

Let me also take this opportunity to congratulate the Member States on the occasion of the 25<sup>th</sup> anniversary of the RCA. It is but fitting that we congratulate ourselves for the relentless efforts we have made towards meeting the objectives of the Agreement and for the cooperation that we have shown.

The Philippines is looking forward to a revitalized RCA for the next 25 years when expectations of various Member States in terms of commitment, regional management and funding will be realized.

**Philippine Participation in RCA Activities**

**1. "The Use of Isotopes and Radiation to Strengthen Technology and Support Environmentally Sustainable Development"- RAS/92/073**

We noted that the recently-concluded UNDP project had demonstrated that TCDC activities are a significant part of all RCA projects. We wish to state our appreciation to Prof. Pham Duy Hien, CTO, for steering the project to a successful conclusion.

While officially the project terminated on December 31, 1996, project activities had been undertaken for the reporting period, and the project-related activities carried out even beyond the terminal date, are as follows:

- a. **Radiation Technology** - The Philippines participated at the Regional (RCA) Training Course on Quality Control of RVNRL, Jakarta, Indonesia on July 21-25, 1997 and at the UNDP/RCA/IAEA Regional Training Course on Radiation Curing which was held in Takasaki, Japan on November 18-22 1996.
- b. **Non-Destructive Testing** - Activities have been sustained despite the project termination. For the year 1997, the following training courses were conducted at the Philippine Nuclear Research Institute: one Level 2 course on Surface Methods, three Level 2 courses on Radiographic Testing, one Level 3 course on Ultrasonic Testing and four Level 2 courses on Ultrasonic Testing. Additionally, three National Certification Examinations for 1997 for all NDT Methods and Proficiency Levels were conducted.
- c. **Tracer Technology & Nucleonics Control System** - The Philippines participated at the Regional (RCA) Training Workshop on Tracer Techniques for Oil Field Development at Tianjin and Beijing, People's Republic of China on June 16-24, 1997. We will also participate at the Regional (RCA) Training Workshop on Nucleonic Instrumentation at Melbourne and Sydney, Australia on October 6-10, 1997.

- d. Nuclear Analytical Techniques** - We are interested in conducting a National Training Course on Chemometrics right after the Regional Workshop, the schedule of which is still unknown to the National Coordinator of the Project. Any feedback on the proposed Regional Workshop will be greatly appreciated.

The Philippines will participate in the new **CRP on Radiation Processing of Indigenous Natural Polymers and Radiation Vulcanization of Natural Rubber Latex** under the new RCA project. Though the Philippines will not yet participate in the **CRP on Upgrading of Cellulosic Wastes to Useful Products**, it will participate in the survey of local cellulosic agro-wastes.

**2. "The Standardization of I-131 Treatment for Hyperthyroidism with an intent to Optimize Radiation Dose and Treatment Response" -**

The project collected ninety (90) new hyperthyroid patients in line with the revised protocol which requires only 50 patients. The analysis and progress of the project will be reported at the 2<sup>nd</sup> National Coordinators' Meeting on October 20-22, 1997 in Bangkok.

**3. "Diagnosis of Hepatitis B By Radioimmunoassay" -RAS/6/018**

HBe markers are being assayed in pregnant mothers and volunteer blood donors to determine infertility rate of persons infected by HBSAg. A final report will be submitted as soon as assays for HBe in other risk groups have been completed.

**4. "Radiation Sterilization of Tissue Grafts" - RAS/7/003**

Amnion processing was transferred to the Biomed Section of the PNRI and a Memorandum of Agreement was forged between the PNRI Director and Dr. N. R. Agcaoili representing the Tissue Bank for the transfer of (1) unit of Freeze drier for use of the amnion project. There was an increase in the harvest of deep-frozen large segment allografts for reconstruction in limb saving surgeries for tumor and trauma cases. The information dissemination campaign was stepped up, spearheaded by Dr. Edward Wang, Chief of the UP-PGH Tissue Bank and Head of the Musculoskeletal Tumor Unit of the Department of Orthopedics of the Philippine General Hospital. These were carried out through exhibits in science fairs, presentations and lectures in conferences; and in teaching rounds for medical students.

The PNRI, in collaboration with four government hospitals, conducted a project on radiation-sterilized amnions as biological dressings for partial thickness wounds. The donors of fresh amnion membranes were tested for hepatitis and HIV contamination prior to processing and irradiation. To date, the PNRI produced and irradiated about 1,200 pieces of freeze-dried amnion. These were utilized by plastic surgeons in the treatment of partial thickness wounds in cases of burns, donor sites and reconstructive surgeries. The amnion membranes provided remarkable relief of pain, controlled oozing of tissue fluids and prevented infection in the burn wounds.

The Philippine National Coordinator attended the National Coordinators' Meeting at Gold Coast, Australia on September 30 - October 4, 1996 and the Distant Learning Programme on Tissue Banking Workshop held in Vienna..

Dr. Wang will attend the Convention of the International Society of Limb Salvage in New York on November 9, 1997. He will exhibit a poster presentation on the use of irradiated large segment allografts in limb saving surgery in the Philippines and will present the results of the operations.

We have nominated the tissue technician of our Tissue Bank to the forthcoming Regional (RCA) Training Course for Delivery of Curriculum and Tissue Bank Operators which will be held at Singapore on November 3-15, 1997.

#### **5. "Maintenance of Nuclear Instruments" - RAS/4/008**

The Philippine Nuclear Research Institute hosted the Working Group Meeting on "Drafting a Handbook on the Care, Handling and Effective Protection of Nuclear Medicine Instruments" on March 17 - 21, 1997. The objective of the meeting was to draft the handbook and the target readers of the said handbook will be physicians, technologists, and medical physicists who deal with nuclear medicine instruments and request rules and information to take care and properly maintain such instruments before and after installation. Seven experts from different member states (China, India, Pakistan, Austria, Philippines and a representative from the IAEA) attended the Working Group Meeting..

Two PC-AT Gamma Camera Interfacing cards from Slovenia and one Indian card were received for the project. Analog gamma cameras where the said cards will be connected are being evaluated.

#### **6. "Thematic Programme on Health Care" - RAS/6/028**

The Philippines participated at the Experts' Meeting on "Development of Sectoral Strategy for Nuclear Medicine in Health Care" in Asia and the Pacific Region on September 1-5, 1997 in Jakarta, Indonesia. We are ready to harness and commit facilities, resources and manpower for the accomplishment of the project.

The Philippine National Coordinator for the RAS project on "Radioimmunoassay of Tumor Markers for the Detection and Management of Cancer" attended the 1<sup>st</sup> RCM held in Colombo, Sri Lanka on June 23-27, 1997. It may be informed that in the Philippines, there are five (5) Nuclear Medicine laboratories which can be networked into the project, namely: the Philippine General Hospital, Rizal Medical Center, Veterans Memorial Medical Center, Santo Tomas University Hospital and Cebu Doctors' Hospital. Two other large institutions, Jose R. Reyes Memorial Medical Center and Makati Medical Center, can serve as collection centers for clinical specimens later.

#### **7. "Public Acceptance of and Trade Development in Irradiated Foods"- RAS/0/022**

The Philippines welcomed the three-man mission of Mr. Harry C. Mussman, Mr. Yves M. Henon and Mr. James Fons on October 7-18, 1996. The Mission felt that there

is a need for a medical products irradiator. The Philippine Counterpart Team learned much from the practical information that the mission had provided.

The PNRI is studying the efficacy of gamma radiation for the insect disinfection, microbial decontamination and shelf-life extension of rice and corn. Initially, it was found out that the microbiological quality of rice was effectively improved by a gamma radiation dose of 3.0 kGy. A reduction of about 3 log cycles at a dose of 5.0 kGy was obtained in the irradiated lots of corn.

#### **8. "Energy, Electricity and Nuclear Power Planning" - RAS/0/023**

The Philippines is pleased with the acceptance of our nominated participants to the Regional (RCA) Training Workshop on WASP-14 Computer Model which will be held at Taejon, Korea on October 13-24, 1997.

#### **9. "Nuclear Power Planning" - RAS/0/021**

The Philippines hosted the Regional Training Workshop on the Economic and Financial Aspects of Nuclear Power Programs on August 25 - 29, 1997 at the Philippine Nuclear Research Institute. This workshop was attended by twenty (20) foreign participants from Bangladesh, China, India, Indonesia, Republic of Korea, Malaysia, Pakistan, Thailand and Vietnam and four (4) Philippine participants. There were six (6) foreign lecturers including the IAEA Project Officer and four (4) local lecturers.

We sent a nomination for the IAEA/RCA RTC on Nuclear Power Project Planning and Implementation which will be held on November 3-21, 1997 in Taejon, Korea. We would appreciate being informed of the status of our nomination.

#### **10. "Nuclear Information System" - RAS/0/019**

The Philippine INIS Liaison Officer attended the 4<sup>th</sup> RCA Expert Group Meeting in Vienna on May 20, 1997 where the six centres which will receive the basic equipment were identified. We are indeed pleased to be a recipient of one PC + modem system and one laser printer. We hope to receive them towards the end of the year.

The Philippines will participate in the new proposed RCA project "Sustainable Nuclear Information Network in RCA Member States."

#### **11. "Radiation Protection Infrastructure" - RAS/9/018**

The Philippines participated in the Project Formulation Meeting held in Seoul, Republic of Korea on February 1997 to plan the next phase of this RCA as the current programme concludes this year. We take this occasion to commend the work of the RCA Task Group in putting together the draft report on proposals for Phase III of RAS/9/018 which largely facilitated the discussion during the formulation meeting not only resulting in a much focussed program but also addresses a broader scope of radiation protection issues and not just infrastructure development. We reiterate our strong support for this project

and fully endorse the project activities drawn for the next five years and also, the recommendations contained in the draft report of the formulation meeting.

The Philippines also participated in the Regional Workshop on the Development of Distance Learning Materials in Radiation Protection held at the Australian Science and Technology Organization in Sydney, Australia. We reiterate our commitment in trialling these materials in the country in accordance with the trialling mechanism agreed upon by the workshop participants.

We are pleased to host the Regional Workshop on Emergency Planning, Accident Assessment and Response to Nuclear and Radiological Accidents in Manila in November of this year.

### **NEW JOINT UNDP/RCA/IAEA PROJECT - "BETTER MANAGEMENT OF THE ENVIRONMENT AND INDUSTRIAL GROWTH"**

We acknowledge the difficulties in funding the new project by UNDP and appreciate its support to three (3) sub-areas: marine pollution, air pollution and electronic networking. The IAEA funding support is also appreciated. It is up to us, the Member States, to seek other funding sources if we are intent in having the total project implemented, or not being successful in that, to put together activities in the most urgent and priority sub-areas previously identified by the Member States.

### **RCA MANAGEMENT**

This has been discussed in the last 2-3 years and our views are as follows:

- a. On RCA Guidelines and Operating Rules - The Philippines is endorsing these new RCA Guidelines and Operating Rules.
- b. On RCA Representative in the Region - We hope that the results of the study will indicate the feasibility in terms of financial and geographical reach of this new management initiative.

### **DEVELOPMENT FINANCE**

We look forward to having mechanisms in place so that least developed countries in the region can avail of technology transfer via such mechanisms. The effort of the New Zealand representative, as well as other Member States, is appreciated.

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## COUNTRY STATEMENT -SRI LANKA

26th General Conference Meeting of the RCA Member States,  
Vienna, Austria - 1 October, 1997

Mr.Chairman, distinguished delegates and other participants. Please accept my congratulations on your selection to Chair this meeting.

The RCA, having completed twenty five years is looking forward to achieve a greater progress in the future. This meeting is a forum for us to take stock of past and to look for the future with a greater vision. For Sri Lanka, RCA is a model, worthy of emulation by all concerned about regional cooperation. During the last twenty five years, RCA programmes have helped Sri Lanka to assimilate technologies in the nuclear field and put such technologies into use in national development programmes. Needless to say that without RCA, some of the programmes which are making an impact on national technology transfer programmes would not have been at all possible.

Sri Lanka attributes, the success of RCA and its continuity to the present day to the articles of RCA, which are the cornerstones of RCA and the total commitment of RCA member states. Sri Lanka notes with appreciation the contribution made by Mr.John Rolland, the distinguished delegate from Australia and Mr.H.S. Cherif, Advisor to DG of the IAEA on revising the management structure of RCA. It is the expectation of my delegation that the measures to be adopted soon under the new management structure of RCA will provide a solid foundation on which RCA can build up in the next twenty five years. It is also necessary to work out a time frame to introduce new management structure preferably in a well documented form.

My delegation would also like to congratulate the distinguished delegate from Indonesia for preparing a paper on "RCA in the next 25 years ". It is noted with interest the proposed vision statement of RCA through which RCA can achieve important goals such as technical cooperation among developing countries (TCDC) through the network of regional resource units (RRU)

Under the "RCA in the next 25 years ", Sri Lanka made a proposal at the 19th Working Group Meeting held in Myanmar this year to explore the possibility of raising development finance within RCA for less developed countries. This was aimed at bringing benefits of RCA programmes to end users through greater private sector participation.

If this is proved practical it would also provide greater avenues for TCDC and provide opportunities to export technologies and services to less developed countries by developed countries in the RCA.

Sri Lanka delegation would like to thank the distinguished delegate from New Zealand for preparing a paper on "Development Finance" with the cooperation of distinguished delegates from Phillipines and Indonesia.

My delegation firmly believes that the proposed regional representative of RCA could play a role in this context as a negotiator of development finance on behalf of RCA with prospective lending organisations.

The paper on "TCDC in the RCA Programme" prepared by the distinguished delegate of Malaysia highlights the TCDC within RCA and propose very practical methods through which RCA can enhance TCDC activities. My delegation would like to thank the distinguished delegate of Malaysia for preparing this paper on TCDC and functioning as the TCDC contact point of RCA.

On behalf of the Government of Sri Lanka I wish to express my gratitude to IAEA , RCA member states, donor countries and UNDP for launching the project on "Better Management of the Environment, Natural Resources and Industrial Growth and securing funds for the Project .It is now needed to identify the sub projects under the titles.

Air Pollution Assesments  
Marine Coastal Environment  
Electronic Networking & Outreach

and the appointment of suitable national coordinators, followed by continuous monitoring of the progress of these sub projects with having identified realistic quantifiable indicators. This would enable RCA to secure enhanced funding from UNDP in future for regional projects.

In conclusion Sri Lanka sincerely hope that RCA would go from strength to strength with the support of the new management structure and to become a success story in the next twenty five years.

**Country Statement of Thailand**  
**at the 26<sup>th</sup> General Conference**  
**of Representative of RCA Member States**  
**1 October 1997**

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Mr. Chairman,

Distinguished delegates, Ladies and Gentlemen,

Firstly, on behalf of the Thai delegation, I would like to express my sincere congratulation to the chairman of the 26<sup>th</sup> General Conference of Representative of RCA Member States. It is my great pleasure to participate in this important meeting.

Secondly, please let us to express my appreciation to the government of Myanmar for the warmest hospitality during the 19<sup>th</sup> Working Group Meeting.

Thirdly, we would like to congratulate the IAEA for UNDP supporting project no. RAS/8/076 - Better Management of the Environment, Natural Resources and Industrial Growth through Isotopes and Radiation Technology. We believe that this support can be met the achievement regarding the environment and natural resource in the Asia and Pacific region.

In this occasion, we are pleased to mention that with kind contributions and collaboration among all the RCA Member States, UNDP and the IAEA, the RCA programs have significantly accelerated the peaceful uses of nuclear technology in the fields of medicine, agriculture, industry and the environment.

A brief summary of activities which have been implemented during the past year, in connection with their impacts to the development of Thailand is given as follows:

## REGIONAL INDUSTRIAL AND ENVIRONMENTAL PROJECT

### Nucleonic Control System

The benefit of NCS in Paper Industry and Coal Processing have been recognized in the RCA region through REM and RW programs.

### Tracer Technology

Thai Petrochemical industries have gained the benefit of the using gamma scanning technique. This technology would be enhanced through the region by TCDC mechanism.

The National Seminar on the application of Isotope Technique in Hydrology has been conducted in Thailand. About 35 persons had participated in the Seminar.

### Nuclear Analytical Techniques

The NAT activity is the research work under Coordinated Research Programme (CRP) entitled "Applied Research on Air Pollution using Nuclear related Analytical Techniques in Asia and Pacific Region" (RC no. 8548/R1). A hundred of air filter samples collected from urban residential areas per annum. The research work has made good progress.

### Non-Destructive Evaluation

The OAEP has organized national training courses on RT,UT and SM. There are 60 persons to be trained in 1997.

### Radiation Technology

There have been ongoing activities on Radiation Sterilization, RVNRL, Radiation Curing and Radiation Treatment of Sewage Sludge.

## MEDICAL AND BIOLOGICAL APPLICATIONS

### Radiation Sterilization of Biological Tissue Grafts

The Bangkok Biomedical Center in Thailand proposed to be the placement for IAEA fellowships in Asia and the Pacific region to be trained on Tissue Banking. The period of training should be 6 months. About 6 fellows can be accepted for training per annum.

### Nuclear Instruments Maintenance

LAN system has been set and linked between micro computer in Nuclear Medicine at Siriraj hospital. By using gamma camera image acquisition card (A/D interface card) providing from IAEA, Slovenia (GAMMA-PF) or India card (ANUGAMI-S), the system is able to collect data from gamma camera to PC and then transfer all the data files to the computer server. Hence it is ready either for linking or transferring the data to other Nuclear medicine sites which are outside Siriraj hospital.

### AGRICULTURE APPLICATIONS

#### PA and Trade in Irradiated Food

In 1997, 1,300 tons of irradiated foods including frozen shrimp, frozen chicken, onion, sausage, rice and mung bean were done at the Thai Irradiation Center, OAEP. About 200 tons of pork sausage were sold in markets in Bangkok per annum. At the present, eighteen items of irradiated foods have been approved by the Food and Drug Administration of Thailand.

### GENERAL PROJECTS

#### Nuclear Energy Planning

The cabinet has approved to establish the committee to study the possibility for constructing of Nuclear Power Plant in Thailand which chaired by the Minister of Science, Technology and Environment. The Secretary-General of OAEP is the secretary of the committee. Four sub-committees have been established and assigned by the committee to study

regarding safety and technology, economic feasibility, environment impact and public acceptance of Nuclear Power Plant. We expect that about 4-5 years the result can be concluded and submitted to the government for making the decision.

### Nuclear Information System

There have been ongoing INIS activities including compiling the information at OAEP. We also enhance the sharing and dissemination of nuclear information resources among member states in this region.

### Extra Budgetary Contribution

It is well recognized that the projects in the framework of RCA programme have provided the valuable opportunities for all member states to share our concepts and progress actions to apply the nuclear technology for economics & social development as well as environmental aspects. The outcomes of the projects have benefit the welfare of the people in the region. Thailand is pleased to share our activities with all of member states.

Finally, we would like to express our gratitude to IAEA, UNDP, all donor countries and also all RCA member states for kind contribution to Thailand during the past years.

Thank you

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**COUNTRY STATEMENT OF VIETNAM  
26<sup>th</sup> RCA GENERAL CONFERENCE MEETING  
OCTOBER, 1996**

Mr. Chairman, distinguished delegates,  
ladies and gentlemen,

On behalf of the Vietnam Delegation, I would like to welcome celebration of 25<sup>th</sup> Anniversary of the establishment of the RCA. I am very happy to state that RCA is an effective instrument of regional co-operation between all member countries and has played a noticeable role in the promotion of peaceful uses of nuclear science and technology for mutual benefits of this region.

It is regret that due to the historical circumstance, Vietnam only has opportunity to promote its participation in RCA activities in 10 passed years although it has joined RCA from 12/6/1972; so that disadvantages can not be avoided. Up to now, Vietnam has been participating in almost all activities of RCA and has benefited specially in manpower training from the technical co-operation contributing to the national socio-economic development

A brief description of the RCA activities in Vietnam is given below.

## **I. INDUSTRY AND ENVIRONMENT**

### **I.1. Advanced industrial techniques (RAS/8/077)**

#### **I.1.1. NDE**

The activities of the IAEA-TC-Project and the participation of Vietnam in the UNDP/IAEA/RCA industrial project have met the needs and requirements of economic growth of our country and they partly helped us to improve the situation on quality control of products.

The National Certificate Board and the National Examination Board of Vietnam were established. The National Technique Committee on NDT, named TC-135, was set up for compiling NDT standards. It is necessary to emphasize that, the need of NDE service in Vietnam is growing up with the rate of economical development. Vietnam is focusing in the hamonization:

1. Organization training course for level I,II, and III NDT personnel with national qualification and certification scheme (in concordance with international and regional schemes); National NDT standards (TCVN);

Regulation for NDE of National metallic products included exported and imported products. Regulation for NDE of non-metallic products especially for non-residential buildings and residential apartments. Regulation for NDT services of NDE Organizations.

2. Establishing some accredited NDE training Centers. These Centers need a strong budget support from the Government, International and regional projects.
3. Organizing good NDE services in the country. Continuing to develop and apply NDE methods for specific industries for metallic materials and for non-metallic materials. Developing NDE methods for assessment and quality control of civil engineering constructions.

### ***1.1.2. Radiation processing of polymers***

The research activities related to Radiation processing of polymers have been promoted in Vietnam. Some radiation facilities were established at Hanoi and Hochiminh City. Vietnam pays attention to developing some radiation technologies such as: radiation sterilization, radiation modification of polymer, radiation vulcanization of natural rubber latex, cross linking of polyethylene articles, radiation degradation of natural polymers.

Vietnam would like to express its warm welcome to the new project on "Radiation Processing of indigenous natural Polymers" and Applied Radiation Chemistry for Polymers".

### **1.2. Optimization of selected industrial processes through the use of nucleonic control system & tracer technology (RAS/8/078)**

With the assistance of IAEA experts under the project VIE/8/007 and through sub-project RAS/8/071, radioactive glasses Ir-192 for tracer experiments in sedimentology study were successfully manufactured in Vietnam. The main activities related to NCS and TT are promoted such as: preparation work for study of suspended sediment transport in Danhim dam; field experiments to study on sediment movement at dumping points of Haiphong port in the framework of the contract between Nuclear Research institute (NRI) and Vietnam Maritime Safety Agency (VMS). The first time Iridium-192 tracer has been manufactured and used for the field experiments. Underground water studies at Hochiminh City and other provinces.

The main achievements are: laboratories of sedimentology, hydrology and NCS have been established and reinforced in equipment and manpower. The tracer groups have grown up and have been capable to perform the field

experiments to investigate the bed-load transport at the harbours, the seepage in the hydropower dams, the filtration velocity of groundwater in Mekong delta, ect. A number of staff has gotten more knowledge and professional experience through the RTC, RW and REMS, EMG. It is a good chance for exchanging information and experience among regional countries.

### **I.3. Better management of the environment natural resources & industrial growth through isotope and radiation technology (RAS/8/076)**

This joint UNDP/RCA/IAEA project has been set up continuing RAS/92/073, Vietnam would like to express the deepest gratitude to UNDP and IAEA for their strong support enabling the expansion of industrial uses of isotopes and radiation as well as better management of the environment, natural resources.

The NAT related activities have been promoted in Vietnam with the main objectives:

1. Establishment of facilities and programme for the collection and analysis of the airborne particulate matter at urban and rural sites in all participating Member states; these activities are expected to lead to the generation of data which, for the first time ever in the member states, will provide comparative data on absolute and relative levels of air pollution in particle size range ( $<2\mu\text{m}$ ,  $2-10\mu\text{m}$ ) that have a direct impact on human health.
2. Promotion of the use of chemometrics and advanced statistical techniques in environmental research and monitoring.
3. Agreement to implement laboratory quality management systems modelled on requirement of ISO 25 and ISO 9000.

## **II. MEDICAL AND BIOLOGY**

### **II.1. Thematic programme on tissue banking (RAS/7/008)**

Up to now, two Tissue Banks have been established in Hanoi and Hochiminh City. Seven training courses on tissue preservation by radiation sterilization and clinical use were hold with 48 participants. Two doctors were trained in regional training courses. 4.174 products were made this year including: Amniotic membrane: 400 items; Frog's skin: 3.400 items; Dura mater: 20 items; Bone 329 items and Catilage: 15 items. 52 patients were treated bon allografts and 85 burned patients were treated by biomembrane which stelization

by gamma source. Two experts were provided on ad hoc request for attending the first national conference on Social and Medical Aspects of Tissue Donation and transplantation, Hanoi 25-26 and Hochiminh City 28-29 November 1996 cum final review of IAEA TA project VIE/7/004.

## **II.2. Maintenance of nuclear medicine equipment (RAS/4/008)**

In 1997 the project RAS/4/008 was continued with following main tasks: maintenance, repair, upgrading, manufacturing of nuclear medicine instruments and personnel training. The national training course on application SPECT was organized in Hanoi, Vietnam from 9 to 27 June, 1997.

We are warmly welcome to the new project on " Upgrading Analogue Gamma Cameras" for 1998-2002 years.

## **II.3. Radio-immunoassay (RIA) of tumour markers for the detection and management of cancer**

All activities of this new project are carried out in some Vietnam's hospitals. This is major field where nuclear applications are found most successful.

## **III. AGRICULTURE AND FOOD**

The last trial of 25 tones of irradiated rice was completed in 1997. No negative answer was received from consumers. The results are encouraging commercial partners to develop the marketing test in near future, from experience we could make the following comments:

1. Consumers prefer irradiated onions and rice against unirradiated ones. No adverse statements regarding quality of irradiated food were received from consumers. The fear of "irradiation" existed, but a proper explanation could resolve the problem.
2. Price of irradiated product must be the same as market price. We could not add the irradiation/ transportation cost to treated product because the Vietnamese buyers always look at price firstly. We could cover our expenses by off-season price for onions (2-5 times higher than a season price), or by stabilising factor in case of irradiated rice.
3. Demonstration of BBC and IAEA tapes of food irradiation in the central Television Programme was very useful in public education.

4. Active participation of trade partners either state or private plays a crucial role for commercial development of irradiation in Vietnam.

In the framework of RAS/5/030 the Third Regional Workshop on "Improving animal production through the application of feed supplementation strategies and immunoassay techniques" will be hosted from 9-13 February 1998, at the Institute of Agricultural Sciences of South Vietnam. The main objectives of the workshop are to review progress in the implementation of the project, to see the impact of UMMB supplementary feeding strategies adopted in the various participating countries and to agree on future workplan.

## **IV. RADIATION PROTECTION AND WASTE MANAGEMENT**

### **IV.1. Strengthening radiation protection Infrastructure phase III**

Situation of Radiation Protection is improved better day by day not only in the training, inspection but also in the legal system related to radiation protection:

- Ordinance on Radiation Safety and Control has been enacted and is in force since January the first, 1997
- Some documents are drafted such as :
  - + Governmental Decree on Implementation of this Ordinance
  - + Regulations on Radioactive Waste Management

120 radiation workers attended two local training courses which to be hosted in Vietnam: "Radiation Protection for Radiation Worker in Medical, Danang Province, from 29 to 30 July 1997 and "Radiation Protection for Radiation Worker in Viet-So Petrol", Vung tau City, from 4 to 13 August 1997.

### **IV.2. Preparation for disposal of low and intermediate level waste-non power sources**

The prepared activities to expand this new project were promoted in Vietnam with the main tasks:

- To measure the radioactive activity of Liquid waste and Solid in laboratories for processing of radioactive and rare ores.
- To research the technological flow-sheets for treatment of liquid waste and solid waste.

## **V. ENERGY AND NUCLEAR INFORMATION SYSTEM**

At the present time, the Vietnam Government has created different projects aimed to confirm the introduction of nuclear power in Vietnam. These projects are as follows:

- The national industrial project: "General survey studies for the introduction of nuclear power in Vietnam" sponsored by Ministry of Industry. The Institute of Energy of the Electricity of Vietnam and Nuclear Power Center of VAEC is the main responsible for this project. This project will be carried out in two years 1996-1998.

- In the frame of IAEA technical co-operation programme, the Vietnam Government has also submitted a request for IAEA the TC-Project: "Pre-feasibility study for introduction of Nuclear power in Vietnam", this project is ongoing in the years 1997-1998.

After the completion these two projects, the Government will have overall discussion related to the possibility of the introduction of nuclear power in Vietnam for making decision "To go Nuclear".

The information Centre of the VAEC has been continuing co-operative activities with other countries as well as has prepared to establishment to be provided from the new project for establishment of INTERNET link.

## **VI. CONCLUSION**

After 25 years of activities, the RCA has obtained excellent achievements and now RCA is facing the big changes. We can say that change is necessary, but carefulness and patience are needed to get a high consensus of all state members. Because this consensus is the drive force of RCA the success during 25 past years and surely in the next years.

We believe that RCA can and will continue to play a vital role in strengthening the 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.



# **EXTENSION OF RCA AGREEMENT**

## **Activities Related to the Extension**

- ◆ **At the RCA Working Group Meeting held in Beijing, China, 20-24 May 1996, participants agreed in principle that the Agreement should be extended.**
  
- ◆ **On 4 July 1996 the Agency circulated to RCA Member States a draft extension document for comments and proposals. Six countries accepted the proposed text of the extension document, and two countries notified the Agency of their decision to extend the Agreement.**



## **EXTENSION OF RCA AGREEMENT (cont'd)**

- ◆ **On 6 September 1996 Japan presented its comments proposing to correct the dates of the expiration and extension of the Agreement.**
  
- ◆ **On 9 May 1997 the Agency circulated a corrected text of the extension Agreement. No comments or proposals were received by the established time limit (23 May 1997).**



## **EXTENSION OF RCA AGREEMENT (cont'd)**

- ◆ **According to its terms the extension Agreement entered into force on 16 October 1996, and the 1987 RCA Agreement was extended for a further five-year period with effect from 12 June 1997. By that time 6 additional RCA Member States adhered to the extension.**
  
- ◆ **In July 1997 one more country notified the Agency of its decision to extend the Agreement.**



## **EXTENSION OF RCA AGREEMENT (cont'd)**

- ◆ **On 7 August 1997 the Agency circulated a letter inviting those RCA Member States that had not yet adhered to the extension to advise the Agency as to whether they intend to do so. Since then two countries have adhered to the extension.**
  
- ◆ **The Missions of RCA Member States in Vienna have been regularly informed of the situation with the extension.**
  
- ◆ **Six Member States have not yet adhered to the extension of the RCA Agreement.**



# **EXTENSION OF RCA AGREEMENT**

*Status as of 25 September 1997*

|     | <b>STATE</b>             | <b>Date of Notification<br/>of the Extension</b> |
|-----|--------------------------|--|
| 1.  | <b>Australia</b>         |  |
| 2.  | <b>Bangladesh</b>        | <b>16.10.96</b>                                  |
| 3.  | <b>China</b>             | <b>11.04.97</b>                                  |
| 4.  | <b>India</b>             | <b>18.04.97</b>                                  |
| 5.  | <b>Indonesia</b>         |  |
| 6.  | <b>Japan</b>             | <b>18.07.97</b>                                  |
| 7.  | <b>Republic of Korea</b> | <b>12.05.97</b>                                  |
| 8.  | <b>Malaysia</b>          | <b>14.03.97</b>                                  |
| 9.  | <b>Mongolia</b>          |  |
| 10. | <b>Myanmar</b>           |  |
| 11. | <b>New Zealand</b>       |  |
| 12. | <b>Pakistan</b>          | <b>05.02.97</b>                                  |
| 13. | <b>Philippines</b>       | <b>11.09.97</b>                                  |
| 14. | <b>Singapore</b>         | <b>24.09.96</b>                                  |
| 15. | <b>Sri Lanka</b>         | <b>09.06.97</b>                                  |
| 16. | <b>Thailand</b>          |  |
| 17. | <b>Viet Nam</b>          | <b>28.08.97</b>                                  |