



ARCAL

**ACUERDO DE COOPERACION PARA LA PROMOCION DE LA CIENCIA Y LA TECNOLOGIA
NUCLEARES EN AMERICA LATINA Y EL CARIBE**

**MINUTES OF THE QUADRIpartite FORUM
AFRA/ARASIA/ARCAL/RCA
VIENNA, 18 SEPTEMBER 2003
(Versión Original en Inglés)**

**V REUNION DEL ORGANO
DE COORDINACION TECNICA**

**(XXI REUNION
DE COORDINACION TECNICA)**

**CIUDAD DE GUATEMALA, GUATEMALA
24 AL 28 DE MAYO DE 2004**

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1. INTRODUCTION

The Quadripartite Forum was convened at the VIC on 18 September 2003. The participants included Representatives from AFRA, ARASIA, ARCAL and RCA and concerned staff of IAEA. The list of participants is attached in Annex-1.

The IAEA was represented by Ms. Ana Maria Cetto, DDG-TC, the Directors Mr. B-K Kim and Mr. P. Salema and the Regional Co-ordinators: Mr. M. Maksoudi (AFRA), Mr. S. Chaudhri (Head of the West Asia Section and Coordinator ARASIA), Ms. M. Zednik (ARCAL) and Mr. P. Dias (RCA) and other Agency Officials.

The main objectives of the forum were:

- To share experience and information with the aim to promote TCDC modality among the four Agreements;
- To present the achievements/success stories obtained under two successful projects in AFRA, ARCAL and RCA that could be of interest to the others;
- To discuss and agree on proposals for networking among Agreements and proposals for exchange of information and project experience.

The Chairperson of AFRA, Mr. Lumu Badimbayi-Matu, Director of the Atomic Energy General Commission of the Democratic Republic of Congo, made a few remarks and handed over the chair to the ARCAL Representative, Ms. Angelina Diaz García President of the Nuclear Energy Agency of Cuba, who thanked the AFRA representative for his successful guidance of the previous Tripartite Forum and expressed the honour to chair the Meeting. She spoke briefly about the benefits that can be derived from such Forum. She then invited Ms. Ana María Cetto, DDG-TC, to address the meeting (see Annex 3 for Ms. Cetto's opening remarks).

During the opening the DDG-TC, in her remarks, reiterated the purpose of the Quadripartite forum for facilitating the exchange of information among the 4 Regional Agreements; it is not a new organisation or mechanism for carrying out an interregional project; it is to exchange information on technology on selected cases and basis for co-operation. The forum should focus on substance, concrete results and good success stories.

The forum adopted the provisional Agenda (see Annex 2) and agreed on the following Bureau composition. Chairpersons: Mr. Rohini Hewamann representing RCA, Mr. Lumu Badimbayi-Matu representing AFRA and Mr. Ibrahim Othman representing ARASIA; rapporteur: Ms. Angelina Díaz Garcia representing ARCAL.

2. PRESENTATION OF SUCCESSFUL RESULTS ACHIEVED UNDER SELECTED PROJECTS

The successful projects presented by all Three Agreements are as follows:

- | | |
|--------------|--|
| AFRA | 1) AFRA experience with outsourcing: Lessons Learned |
| | 2) Guidelines and Indicators for the Establishment of Sustainable National Nuclear Institutions (NNIS) |
| ARCAL | 1) “Improving effectiveness in regulatory performance”- RLA/9/043- |
| | 2) “Improving safety in research reactors”-RLA/9/046- |
| RCA | 1) “Sectoral Area-Industry” |
| | 2) “Environment Sector-Thematic Lead Country New Zealand” |

The main results of the above projects are summarized in Annex 4.

3. NETWORKING BETWEEN AFRA, ARCAL AND RCA IN 2002

Similarly to 2001, the exchange of information and experience between the three sister Agreements was performed by means of exchange of experts and harmonized procedures and practices between the three regions as well as in the form of services and goods provided by ARCAL and RCA to AFRA.

1. Exchange of experts and harmonized documents

In 2002, several expert missions were performed by experts from Latin America and Asia to help AFRA Member states introduce improved protocols, practices and methodologies in several fields, including artificial insemination, mutation breeding, reactor utilization and irradiation processing. The experts helped African institutions to review and upgrade existing facilities and practices, introduce improved protocols, particularly in radio-sterilization of some medical supplies and breeding of rice, and maximize the utilization of available infrastructure. Training of African scientists and technicians has been included in all expert missions. Countries that have benefited from these missions include Algeria, Ethiopia, Kenya, Libya, Mauritius, Morocco, Sudan, Uganda, and Tanzania.

From the reports received from the experts and feedback submitted by the recipient institutions, there has been a real transfer of know-how and skills which helped improve the outcomes of the AFRA activities.

Recommendation:

- The identification of suitable experts from these regions is based -in most cases- on personal relationship between the experts and the Agency Technical Officers. It would be much more effective for networking and for enhancing TCDC modality if a formal mechanism is put in place so as to allow more experts from each region to be made available to the other regions.
- The exchange of experts and lecturers between the cooperative agreements will gain in significance if there is a way to monitor progress and to report on impact achieved through this TCDC modality.

2. Provision of goods and services

Here again, AFRA projects made attempts to get services from the other regions, including lecturing in AFRA training courses and workshops and participating in AFRA design and formulation activity. In two cases, experts from Latin America participated in AFRA Specialized Teams on repair and upgrading of gamma cameras.

The most important achievement is by far the adoption by a review and evaluation AFRA Panel of the Argentinean SPECT system for upgrading semi-digital gamma cameras instead of the system proposed by Slovenia.

The Argentinean system and associated software have been installed in two South African hospitals. Plans for the acquisition of additional systems from Argentina are being prepared.

Africa still has about 70 semi-digital gamma cameras in need of upgrading to SPECT.

Recommendation:

- Here again, there is a need to document the successful cases resulting from the application of the TCDC modality between the agreements and to circulate the information and advice to all Member States.
- Agreements can play an important role in the dissemination of relevant information and experience related to the upgrading of gamma cameras as most of our Member States have invested heavily in these facilities.

4. NEXT QUADRIPARTITE FORUM

The Forum agreed that the next quadripartite forum takes place at the time of the General Conference in September 2005. The Agenda of that meeting will follow the format of the present forum.

5. RECOMMENDATIONS

The Forum discussed and agreed on the following recommendations:

- As for the sharing of success stories amongst the Regional Agreements, suggestions were made on the possibility of assessing the best stories amongst the good stories presented by AFRA/ARCAL/RCA. Selected success stories should therefore be compiled in a document and circulated to National Nuclear Institutions and related websites through the office of each Agreement. The task of compiling the identified success stories will be performed by the Agreement, which has the chair of the year.

- The Forum considered that the possibility to use the LIVELINK system could offer an appropriate medium of exchange of information among agreements and therefore requests the support of the IAEA to consider financing the participation of a limited number of members of each agreement.

6. CLOSING

The Chairperson thanked the representatives of four Agreements for their participation in and contribution to this forum.

ANNEX 1

LIST OF PARTICIPANTS TO THE QUADRIPARTITE FORUM: AFRA, ARASIA, ARCAL, RCA & IAEA OFFICIALS

AFRA

ALGERIA	Mr. Messaoud Baalioumer Director of COMENA
CONGO	Mr. Lumu Badimbayi-Matu Fortunat Chairman of AFRA Director of CGEA
EGYPT	Ms. Laila Fikri Founar Director of the Nuclear Research Centre, EAEA
SOUTH AFRICA	Mr. Vuyolwethu Msutwana-Qupe AFRA National Coordinator and IAEA-IC Liaison Officer
SOUTH AFRICA	Mr. Thabo Mafoko Deputy Director International Affairs- Dept. of Minerals and Energy
SUDAN	Mr. Mohamed El-Tayeb Director General, Sudan Atomic Energy Commission

ARCAL

CUBA	Ms. Angelina Díaz García Chairperson of ARCAL President of the Nuclear Energy Agency
CHILE	Ms. Cecilia Urbina ARCAL National Coordinator-CCHEN
URUGUAY	Mr. Alvaro Bermudez Director Nacional de Energía-Comisión Nacional de Energía Atómica
URUGUAY	Ms. Sylvia Fascioli ARCAL National Co-ordinator Dirección Nacional de Tecnología Nuclear

RCA

AUSTRALIA	Mr. Ron Cameron Director, GPA-ANSTD
INDIA	Mr. K. Raguraman National Representative for India, Lead country for Industry
KOREA, REP. OF	Mr. John K. Chung Programme Officer-RCA Regional Office
KOREA, REP. OF	Mr. Chang-Woo Kim Past Chairman RCA and National Representative for Republic of Korea
NEW ZEALAND	Mr. Frank Bruhn National Representative of New Zealand, Lead country for Environment

PAKISTAN	Mr. Munim Awais RCA Chairman Elect and National Representative of Pakistan
PHILIPPINES	Ms. Alumanda M. Dela Rosa Director Philippines Nuclear Research Institution
SRI LANKA	Mr. Rohini Hewamanna Chairman of RCA Mr. Jim-Kyoung Kim Director-RCA Regional Office-RCARO

ARASIA

SYRIAN ARAB REPUBLIC	Mr. Ibrahim Othman Chairman of ARASIA Atomic Energy Commission of Syria
YEMEN	Mr. Mahfoudh Serhan Abdullah Director General-Atomic Energy Commission

IAEA OFFICIALS & STAFF PRESENT

1. Mr. B-K Kim -DIR-TCPB
2. Ms. Ana Maria Cetto -DDG-TC
3. Mr. German Piderit - SH-TCLAS
4. Mr. M. N. Razley - SH-TCAPS
5. Mr. Shamin Chaudri- SH-TCWAS
6. Ms. Maria Zednik - ARCAL Co-ordinator
7. Mr. Prinath Dias- RCA Co-ordinator
8. Ms. Gerardo-Abaya - TCLAS
9. Ms. Carmina Jimenez de Bergant-ARCAL
10. Mr. Kyoung-Pyo Kim- TCAPS
11. Mr. Suarez-Cruz -Nuclear Safety
12. Ms. Natalie Colinet- TCPC
13. Mr. Fathi Khanghi -TCWAS
14. Mr. O'Donnell-Nuclear Safety

ARCAL office support staff

Ms. Dragana Rajkovic
Ms. Lucia Albarran Aguilar

AFRA office support staff

Ms. Michaela Loidolt

ANNEX 2

AGENDA OF THE FORUM

QUADRIPARTITE AFRA/ARASIA/ARCAL/RCA FORUM

18 September 2003, Vienna, Austria

V.I.C., Room C07/V

15:00-17:00

- 15:00 1) Opening remarks by chairperson: AFRA Representative.
Hand-over to new Chairperson, ARCAL
- 15:15 2) Remarks by the DDG-TC
- 15:30 3) Designation of the bureau of the meeting by the new chairpersons:
ARCAL Representative
- Three vice chairpersons: AFRA, ARASIA and RCA
 - Rapporteur: ARCAL
 - Introduction of participants
 - Adoption of Agenda
- 15:45 4) Presentation by the Representatives of the Agreements on transfer
of technologies:
- Review of achievements during the previous year, for promotion of
TCDC among Agreements:
 - 1- Exchange of expertise between the regions
 - 2- Flow of nuclear services and goods between the regions
 - 3- Progress achieved under joint/common activities
 - Presentation of successful projects/stories
- 16:45 5) Adoption of major recommendations of the meeting.
- 17:00 6) Closing

ANNEX 3

Quadripartite Forum
Thursday, 18 September 2003, 15:00-17:00, V. I.C. C07 V

**Address by Dr. Ana María Cetto, Deputy Director General, IAEA
Head of the Department of Technical Cooperation**

Distinguished Representatives of the Regional and Cooperative Agreements

Ladies and Gentlemen:

I would like to welcome you all to this year's Forum: the representatives of the regional agreements AFRA, ARCAL and RCA, and especially of the cooperative agreement ARASIA, who is participating for the first time. For this reason, the Forum has changed its name from Tripartite to Quadripartite.

Cooperative agreements offer a special opportunity to use our imagination and initiatives to promote the spirit of south-south cooperation and the sharing of information and expertise in the field of nuclear science and technology, for the benefit and well-being of all Member States and their populations.

Many initiatives of the existing agreements have been incorporated in the updated TC strategy. This includes the concept of sustainability and self-reliance, building capable national nuclear institutions, good management practices and income generation. Regional and other cooperative agreements can thus play a key role in the promotion of such principles and initiatives.

As you are aware, the sustainability of national nuclear institutions is placed high on the Agency's priority list. Regional and other cooperative agreements should be the driving engine at local and regional level for sensitizing Member States about the need to promote sustainability and for facilitating the necessary changes. They can also promote ways and means for preserving nuclear knowledge by proposing sound succession plans, concrete solutions to brain-drain and realistic measures to secure well-qualified human resources.

The development of human resources in nuclear sciences and applications through regional training courses, workshops and expert missions is generally performed on a sub-regional or regional basis. Joint projects and activities can play a key role in the design and introduction of innovative training and learning materials and methodologies, using also the modern information and communication technologies, for the promotion of self-sufficiency in the field.

The Quadripartite Forum should continue to be a forum for promoting technical cooperation among developing countries through the exchange of experience and information, for learning about the successes from the other regions, and as a vehicle for expanding networking among countries or regions with similar needs or solutions. These are items included in the agenda for the present meeting, and I look forward to a successful outcome of your deliberations.

ANNEX 4

SUCCESS STORIES PRESENTED BY AFRA, ARCAL AND RCA

1) AFRA EXPERIENCE WITH OUTSOURCING: LESSONS LEARNED

INTRODUCTION

The concept of outsourcing Agency activities, particularly in the context of regional Agreements, started to be recognized a few years ago, firstly by the Agency Programme Coordination Committee (PCC) and then by TC. The aim of this initiative is to: i) enhance the utilization of national and regional capabilities and skills available to Member States, ii) promote TCDC, sustainability and self-reliance; iii) reduce costs where possible; and iv) alleviate the workload burden on TC staff.

Used correctly within a mature framework, such as the regional agreements, this initiative can rejuvenate national nuclear institutions, built credibility and recognition at both national and regional levels, enhance relevance and pave the way to sustainability. For these reasons, AFRA has adopted this initiative in 1999 and prepared the necessary procedures and regulations, which have been guiding the utilization of outsourcing in Africa.

GUIDING PRINCIPLES OF THE AFRA OUTSOURCING APPROACH

In accordance with the AFRA Principles, which encourage the optimal utilization of available regional infrastructure and expertise for the benefit of the African nuclear community, AFRA activities should be outsourced to African institutions where **this is technically feasible and economically cost-effective**. Along this line, AFRA Member States approved a set of guiding principle to regulate this important activity and to promote excellence and high quality services.

These are:

- Efficiency and cost-effectiveness should guide any outsourcing of AFRA activities;
- Maximum use should be made of Regional Designated Centres for outsourcing activities within their respective fields;
- In compliance with the AFRA “Least Intervention Principle”, outsourcing should be preferably awarded to African institutions and experts using the AFRA remuneration schemes;
- It is recognized that in some cases, potential experts from outsourcing institutions may be working in the private sector, or, although still working at national institutions, do so in a commercial environment where costs are expected to be recovered. In these cases, experts recruited will receive normal honorarium;
- Personnel from Government-subsidized institutions should still receive the AFRA expert Token Fee of \$750 per working week;
- Where possible, transfer of technology and know-how should be included in the subcontract to empower less advanced institutions;

- Regular assessment of outsourcing should be performed by the AFRA-Field Management Committee (FMC) to coincide with the relevant project Coordination Meetings; and
- The AFRA-FMC shall report on outsourcing annually to the meetings of the Technical Working Group.

SCOPE OF AFRA OUTSOURCING ACTIVITIES

Since the adoption by AFRA of this initiative and its approval by the IAEA, AFRA outsourced the following activities:

- 15 missions by AFRA Specialized Teams to condition radium sources and other sealed sources in 15 African countries. This activity was supported by dedicated equipment, particularly HEPA Filters which were purchased from Argentina at about \$ 6,000 piece. The Specialized Teams are drawn mainly from South African experts. This activity started in 1999 and is expected to continue as some African countries are still in need of assistance to condition available radioactive sources;
- **13 AFRA training courses and workshops** have been outsourced between November 2000 and September 2003; of which 10 training events were outsourced to South Africa, two to Tunisia and one to Egypt. Two other training courses will be outsourced to Egypt and South Africa in October 2003; bringing to 15 the total outsourced training events under AFRA during the above-mentioned period. **10 of these training events were outsourced to Regional Designated Centres in the fields of waste management, NDT and nuclear instrumentation.**

In most cases, the service provider institutions performed all tasks needed for the successful implementation of these training events. This included the preparation of the training programmes in collaboration with the Agency, the identification and recruitment of local lecturers (foreign lecturers are recruited directly by the Agency), the provision of pre-paid air tickets to all participants, the running and supervision of the training events and the administration of funds for the Agency.

In compliance with the AFRA rules and procedures, the service provider institutions receive in compensation for the services rendered only a fee for the management of the training event. No other costs are reimbursed, including costs for local transportation, local lecturers, logistics and facilities used to implement the training events.

In all cases, a contract has been signed between the Agency and the service provider institution to define responsibilities and tasks, spell out the mandate of the service provider within the framework of the specific training event, and determine the prices involved and how the funds should be utilized. The contract is signed by the TC after clearance by the Legal and Finance divisions.

Once the list of selected participants is finalized, TC forwards this to the service provider institution for action. As this initiative is relatively new and it is not known to the majority of counterparts, the AFRA Coordinator write to all participants giving them

detailed information about the process, including visas, tickets, payments and other arrangements. This is essential for the successful implementation of the training event.

LESSONS LEARNED:

1. Successful outsourcing requires an **active management**, to the right standards, by the **right people** in the Agency and the service provider institution, after the **right preparation**.
2. In almost all cases, the contracted institutions have tried to **drive costs hard and innovated in their particular field of expertise with great speed and depth**.
3. **Institutional commitment** of service providers is another key factor for success. The commitment of the course director or an individual person within the institution is not enough to secure success.
4. There is evidence that Member States have begun to recognize the **real value of outsourcing** and some have in fact taken steps to make use of this initiative by implementing AFRA training events for the Agency.
5. **Significant transfer of know-how benefited the service provider institutions**; in terms of technical knowledge, managerial skills and administration of funds.
6. There was no significant difference in the performance of Regional Designated Centres as compared to other institutions, which have outsourced the 13 AFRA training events. **There was a visible effort in all cases to comply with the Agency quality standards and procedures**.
7. In all cases, the service provider institutions made **commendable efforts** for the implementation of the training events. This included high standard arrangements for accommodation and training, generous hospitality and social programmes.
8. On the whole, the workload on TC staff has **slightly decreased as a result of outsourcing** the 13 AFRA training events. However, **this reduction has not been up to the expectations** of the staff concerned. This seems to be caused by the internal procedures and the many clearances, particularly of financial nature, which are presently required for outsourced activities. This is also due to the fact that these procedures have not been standardized yet within the TC Department.
9. As it can be seen from the attached table, the reduction in the cost of training through outsourcing is **not really decisive. It is within the range of the average costs of AFRA training events**. This is probably because of the low number of outsourced training events among others reasons..
10. There has been a **visible ownership** of the outsourced activities by the institutions, which hosted them. This is also expected to enhance TCDC in the region through exchange of experience and information and the sharing of available facilities and expertise.

CONCLUSIONS AND RECOMMENDATIONS

The first conclusions and lessons learned from this initiative led to the following comments:

- Globally, the initiative is strategically sound and seems to be cost-effective, particularly in the context of AFRA efforts and activities that have been designed to promote TCDC modality and to maximize the utilization of regional expertise and infrastructure.
- The contracted host countries and institutions (whether public or private) usually made the necessary efforts to meet the required quality standards at both organizational and educational levels in compliance with the Agency and AFRA procedures and rules;
- First hand analysis concluded that the cost-effectiveness of out-sourcing is real and therefore needs to be quantified and documented. This should be performed by the AFRA-FMC based on statistics and information to be provided by the Agency;
- The AFRA procedures and guidelines for outsourcing are relevant and should be complied with in all cases;
- The scope of outsourcing should be expanded to cover other potential countries of AFRA where the necessary infrastructure and expertise are available but sufficient awareness is still to be built.
- A special attention should be paid to the promotion of this initiative within the recognized AFRA Regional Designated Centres.
- The Agency procedure for outsourcing needs to be streamlined and simplified. The contract between the Agency and the service provider institution should be improved to include clearer instructions on health insurance, transportation and implications resulting from non- participation of selected candidates
- This initiative should be pursued and African institutions should be encouraged to participate in this process as a way to build capacity and to promote the transfer of know-how.

AFRA OUTSOURCED TRAINING EVENTS 2000 – 2003

Events	Dates & Venues	Title	Number of Participants	Total cost in US\$	Cost per participant in US\$
RAF/0/010-001	13-17 Nov. 2000 Pretoria, SAF	Workshop on Public Relations	16	33,000.00	2,603
RAF/0/017-001	27-31 August 2001 Pretoria, SAF	Design, Development and Maintenance of Country Homepages	21	38,226.29	1,820
RAF/0/014-001	27-31 August 2001 Pretoria, SAF	Integration of National Programmes, Marketing and Efficient Management	22	40,698.52	1,850
RAF/4/015-009	9-13 July 2001 Pretoria, SAF	Management of Disused Sealed Radioactive Sources	22	32,776.00	1,490
RAF/4/016-002	16-27 July 2001 Pretoria, SAF	Experimental Design and Sampling Methodology	19	47,172.49	2,483*
RAF/8/025-007 (partly outsourced)	12-16 Nov. 2001 Johannesburg, SAF	Fabrication of NDT Test Pieces	23	37,566.20	1,633
RAF/0/014-002	23-27 March 2002 Cairo, Egypt	Sustainability and Self-reliance of Radiation Protection Institutions	24	43,394.70	1,808
RAF/0/014-003	27-31 May 2002 Tunis, Tunisia	Sustainability through Integration of National Programmes, Marketing and Good Management	26	55,570.90	2,137
RAF/0/017-002	23-27 September 2002 Pretoria, SAF	for PRO on Management Practices and Relations with Customers	25	49,115.07	1,965
RAF/4/016-003	25-29 November 2002 Pretoria, SAF	QA in NAA as related to mapping and pollution monitoring	19	43,524.89	2,291
RAF/8/032-003	25-29 Nov. 2002 Johannesburg, SAF	Training in NDT Level 3	21	44,650.81	2,126
RAF/4/017-006	4-15 October 2003 Cairo, EGY	Utilization of Modern Troubleshooting Tools and Instruments	upcoming meeting – no final data available yet		

RAF/4/018-001	27-31 October 2003 Pretoria, SAF	QA and QC of Nuclear Analytical Techniques	upcoming meeting – no final data available yet	
RAF/4/018-002	23-27 June 2003 Pretoria, SAF	TC on Quality Management	17	45,434.07
RAF/8/032-004	9-27 June 2003 Johannesburg, SAF	NDT Level 3	18	72,160.67
RAF/8/032-005	5-9 May 2003 Johannesburg, SAF	Managerial Practice, QA Systems and Strategies for Marketing NDT Services	18	36,157.80
RAF/4/017	16-20 June 2003, Tunis, Tunisia	Project Coordination meeting	16	37,970
	TOTAL	13 TRAINING EVENTS	307	619,210
				2,672
				4,008**(Three- week training course)
				2,008
				2,373
				2.017***

* Two-week training courses; ** Three-week training courses

*** This figure represents the average cost per participant

2) AFRA EXPERIENCE: GUIDELINES AND INDICATORS FOR THE ESTABLISHMENT OF SUSTAINABLE NATIONAL NUCLEAR INSTITUTIONS (NNIS)

Why?

Why the emphasis on sustainable NNIs?

Why use sustainability indicators?

CHALLENGES FACING NNIs

- i) Declining donor support for the promotion and development of nuclear science and technology in Africa as a result of shifting in government priorities, general "donor fatigue" and re-direction of aid to other sectors;
- ii) Declining relevance, public perception and credibility at national level;

CHALLENGES FACING NNIs

- iii) Lack of a clear vision, strategic plans and managerial skills;
- iv) Lack of enforced legislative framework in some countries;
- v) Lack of good institutional governance, including accountability and auditing systems.

BROAD CONCEPT OF SUSTAINABILITY

Multi-dimensional and complex interactions between human-beings and their ecosystems

Meeting the needs of the present generation without compromising the needs of future generations

Intra-generational justice, environmental protection and respect for life

The triple bottom line: economic, social, environmental

Sustainability of NNIs

The ability to remain functional and relevant, with an agreed level of dependence on government support and the capacity to adapt to changes in the external environment

How do we plan for sustainability?

Assess the NNI situation:

- SWOT analysis
- Consult with stakeholders

Define mandate and vision of NNI in collaboration with all stakeholders

Formulate a Strategic Action Plan (SAP)

Implementation of the SAP

- ◆ Develop business plans
- ◆ Develop human resources
- ◆ Secure funding
- ◆ Establish physical facilities
- ◆ Establish legal framework

Implementation of SAP (cont.)

- ◆ Build partnerships
- ◆ Involve stakeholders
- ◆ Develop marketing plans
- ◆ Improve public relations
- ◆ Establish business mechanisms

Sustainability indicators

Dimensions of sustainability

Legislative
Institutional
Physical facilities
Financial resources
Human resources

Legislative sustainability

- ◆ Enabling act
- ◆ Rule of law
- ◆ Ability to draft legislation
- ◆ Ability to implement agreements

Institutional sustainability

- ◆ Approved Strategic Action Plan
- ◆ Demonstrated Corporate governance
- ◆ Capacity for planning
- ◆ Operational Information and communication schemes
- ◆ Ability to mobilize support
- ◆ Cooperation
- ◆ Ability to undertake commercial activities
- ◆ Operational Logistical infrastructure

Sustainable physical facilities

- ◆ Adequate Physical infrastructure
- ◆ Ability for maintenance and repair
- ◆ Capability for upgrading and renewal
- ◆ Nuclear safety and security capacity
- ◆ Capability for environmental monitoring
- ◆ Operational Quality management system

Sustainable financial resources

- ◆ Adequate Government budget consistent with the SAP
- ◆ Ability for income generation
- ◆ Demonstrated financial management capability
- ◆ Ability to mobilise funds
- ◆ Operational Business and marketing processes

Sustainable human resources

- ◆ Adequate Personnel
- ◆ Available development and succession plans
- ◆ Human resource management strategy
- ◆ Knowledge development and preservation
- ◆ Occupational health and safety plans
- ◆ Healthy Labour relations

Using the sustainability indicators

- ◆ Agree on the need for sustainability!
- ◆ Understand the terminology
- ◆ Understand the methodology sheets
- ◆ Select appropriate indicators from all dimensions
- ◆ Measure for your institution

Using the indicators (cont.)

- ◆ Encourage discussion and debate
- ◆ Assess the usefulness of the indicators
- ◆ Supply a feedback report to the FMC
- ◆ Exchange experience with other NNIs
- ◆ Set targets and measure over time

Feedback report

- ◆ Indicators used
- ◆ Value derived
- ◆ Problems experienced
- ◆ Fulfillment of criteria
- ◆ Proposals for improvement
- ◆ Suggestions for moving towards AFRA V success

Examples

Terminology

Dimension
Indicator name
Definition/description
Measurement unit
Method of measurement
Sources of information
Limitations
Linkages

Enabling Act

DEFINITION: An Act defining the mandate, organization structure, objectives, budget and management practices of the NNI consistent with the national and international instruments and safety requirements

MEASUREMENT UNIT: Yes/no

METHOD OF MEASUREMENT: Existence of duly enforced act

Enabling Act (cont.)

SOURCES OF INFORMATION: Act and Statutes

LIMITATIONS: Comprehensiveness of Act and Statutes; consistency with other acts

LINKAGES: All other dimensions of sustainability

Maintenance and repair

DEFINITION: Preventative maintenance and repair schemes for equipment and instruments, including plans for the provision of vital spare parts, and availability of skilled personnel to perform the work

MEASUREMENT UNIT: % of unscheduled downtime and seriousness of impact on product and service delivery

Maintenance and repair (cont.)

METHOD OF MEASUREMENT: Determination of extent of unscheduled instrument downtime and of the impact thereof on delivery of products and services

SOURCES OF INFORMATION: SAP, maintenance dept. records, spare part inventories, sales records, etc.

Maintenance and repair (cont.)

LIMITATIONS: Accuracy, reliability and relevance of records

LINKAGES: Personnel, Physical infrastructure, Corporate governance, Legislative framework

Income generation

DEFINITION: Demonstrated ability to generate income through the provision of services and products in order to secure an agreed level of self-funding.

MEASUREMENT UNIT: Percentage of total revenue that is generated from sales of products and services.

Decide whether salaries are included or not!

Income generation (cont.)

METHOD OF MEASUREMENT: Compare Government grant with revenue from sales.

SOURCES OF INFORMATION: Financial reporting, including income statements.

LIMITATIONS: Accuracy and reliability of financial information.

LINKAGES: Various

Labour relations

DEFINITION: Appropriate labour relations, policies and procedures.

MEASUREMENT UNIT: Degree of compliance

METHOD OF MEASUREMENT: Review of existing documents and procedures, e.g. agreements with labour unions, conditions of service, disciplinary code, grievance procedures.

Labour relations (cont.)

DATA AVAILABILITY AND SOURCES: Documents and procedures.

LIMITATIONS: Labour relations practices in the country.

LINKAGES: All HR indicators

Conclusion

Can these indicators assist in achieving sustainable NNIs?

If not, let us improve them.

If yes, let us use and still improve them.

We manage what we measure!

1) ARCAL EXPERIENCE: RLA /9/043 (ARCAL LXVI) IMPROVING EFFECTIVENESS IN REGULATORY PERFORMANCE

Background

- ◆ ARCAL Project XX, RLA 9/028
- ◆ TECDOC 1113
- ◆ TECDOC 1217
- ◆ Qualification and training of regulatory personnel

Purpose

- ◆ Training and qualification of inspectors and evaluators from Regulatory Authorities in Latin America, regarding implementation of regulatory control by practice and, of an assessment system for verifying effectiveness of that control

ARCAL LXVI

Conduction of seven training courses for regulators on the subjects:

- Organization and Implementation of a National Regulatory Program for Control of Radiation Sources;
- Radiation Protection and Safety in: Industrial Radiography, Nuclear Medicine, Diagnostic and Interventional Radiology, Industrial Irradiators, Radiotherapy and, Industry sources.
- Assessment of systems for control of radiation sources by means of performance indicators. This included review of TECDOC 1217

Outcomes and impact

- ◆ 17 countries:
 - 8 for ARCAL Project
 - 9 for the Model Project
- ◆ 137 staff members of Regulatory Authorities:
 - 120 from countries participating in ARCAL
 - 17 from countries in the Model Project
- ◆ 47 experts, from six countries of Latin America, took part as lecturers 4 of these courses were attended by technical officers of the Agency.

Sustainability of achievements

- A document was developed that allows assessment of effectiveness by the system of regulatory control, helping self assessment by Regulatory Authorities in discharging their duties.
- The extent of interaction achieved among Regulatory Authorities through Project Managers and experts, will help exchange of national experiences for:

Sustainability of achievements

- Allowing continuation of benefits achieved with the project by developing new Training Courses for Regulators.
- Resolution of common problems.
- Establishing collaboration agreements among countries.
- Establishing devices for enhancing source control and avoiding illicit traffic of radiation sources.

2) ARCAL EXPERIENCE: PROJECT RLA /9/046 (ARCAL LXVIII) IMPROVING SAFETY IN RESEARCH REACTORS (2001-2002)

INTRODUCTION

BACKGROUND

The project RLA /9/033 (ARCAL XLIV) "Safety in Research Reactors" was implemented in 1999-2000 to improve the capacity of the participating countries for the management of aging and reactor calculations using Monte Carlo techniques.

Introduction – Background cont.

- The project RLA9046 (ARCAL LXVIII), hereby presented, was considered necessary as an extension of this previous project to obtain practical solutions to aging problems, such as the estimation of experimental devices in a bundle of neutrons, in-core experiments and others.

Participating Countries

- Argentina
- Brazil
- Colombia (as of Nov 2001)
- Chile
- Mexico
- Peru

OBJECTIVES

To improve the safety of the research reactors of the region through:

- a) The application of Management Aging Programmes to pre-selected reactors of each participating country in the region.
- b) Facilitating the exchange of information (including preparation of nuclear databases) and, if necessary, of experts in the region.
- c) The improvement of calculating capacities using Monte Carlo techniques
- d) The development of experimental techniques to verify valuable calculation results for reactors in the region, specially, for silicide low enriched uranium cores (fluids, energy spectrums, reactivity, feedback factors)
- e) The study of protection systems applicable to the different types of reactors of the region, their development and construction feasibility

OBTAINED RESULTS

- a) The management aging programmes were applied to the components of the research reactors selected in each country with satisfactory results. A common methodology for aging management was elaborated based on reports presented by the participants and on related TECDOCs of the IAEA. The methodology provides the general guidelines for aging management of research reactors in the region
- b) Estimation capacities were improved with implementation of an advanced course in the use of the MCNP-4B code. The concepts and tools were applied in the modelling and experimental contrast of the cores of the reactors RP-0 and RECH-1 in Chile.

OBTAINED RESULTS

- c) The experimental results from a fresh silicide low enriched uranium core were compared with estimations using the Monte Carlo technique satisfactorily. Consensus values were obtained of reactivity, position of the control rods and the spatial distribution of the fluids.
- d) Workshops held on modernization of the instrumentation concluded with an architecture of the Protection System, the basic design of the instrumentation modules and a set of plans for the development of software systems for critical safety functions.

MAIN PROJECT CONTRIBUTIONS TO THE PARTICIPATING COUNTRIES AND THE REGION

- ◆ A methodology was established for Aging Management common for all the reactors in the region.
- ◆ Activities have been recorded in a shared database of aging management that serves as a reference for countries in the region
- ◆ Participating countries acquired the knowledge for modelling and estimation of the research reactor cores using the Monte Carlo technique, and identified problems and solutions of this modelling.

MAIN PROJECT CONTRIBUTIONS TO THE PARTICIPATING COUNTRIES AND THE REGION

- ◆ The establishment of direct contacts between the specialists in the region, for a better interaction, contributing to the exchange of experiences to find solutions for identified current or future shared problems.
- ◆ The design of the protection system for research reactors showed that sharing knowledge and experiences can result in finding solutions to reduce the costs of each country's needs. The methodology used demonstrated that a modern system could be constructed at a very low cost to replace those currently in use.

PROJECT SUSTAINABILITY

- ◆ In a joint effort it would be possible to develop and apply a prototype of safety protection system. The involvement of the participating countries in such activity would guarantee that each country can cover the post-construction and post-maintenance costs of the units installed.
- ◆ Nevertheless, this would only be possible if exchange of knowledge between the experts continues with a strong support from the authorities of each country and with an initial financial investment.

PROJECT SUSTAINABILITY

- ◆ Even without the construction of the prototype, the methodology learnt once adopted will contribute to the safe and efficient use of research reactors.

1) RCA EXPERIENCE: SECTORAL AREA – INDUSTRY

Ongoing Projects Under Industry

Overall Lead Country - INDIA

1. RAS/8/085 - Non - Destructive Testing and Evaluation (extension) : 1999 - 2004
Budget (2003-2004) - USD\$ 220,000 [FOOT NOTE]
Participating Countries with Government Commitments -
BGD,CPR, IND, INS, MAL, MON, MYA, PAK, PHI, ROK, SRL, THA, VIE (13)
2. RAS/8/091 - Process Diagnostics and Optimization in Petro-chemical Industries (extension) : 2001 - 2004
Lead country - India
Budget (2003-2004) - USD\$ 325,000 [H.C. = 275,000 & FN = 50,000]
Participating Countries with Government Commitments - BGD,CPR, IND, INS, MAL, MON, MYA, PAK, PHI, ROK, SRL, THA, VIE (13)

Ongoing Projects Under Industry [Cont]

3. RAS/8/094 - Optimization of materials in industry by using on-line bulk analysis techniques: [Old RAS/8/089]
Lead country - AUS assisted by NZ
Budget (2003-2004) - USD\$ 260,000
[H.C. = 230,000 & FN = 30,000]
Participating Countries with Government Commitments -
AUL, CPR, IND, INS, JPN, MON, PAK, NZE, THA, VIE (10)
4. RAS/8/096 - Modification of Natural Polymers Through Radiation Processing: [Old RAS/8/090] (E+N): 2001 - 2004
Lead country - Japan
Budget (2003-2004) - USD\$ 200,000 [FOOT NOTE, JPN]
Participating Countries with Government Commitments -
BGD, CPR, IND, INS, JPN, MAL, MYA, PAK, PHI, ROK, THA, VIE (12)

Basis/Impacts:

- ◆ All projects were based on Radioisotope/Radiation Technology demonstration and had immense impact and benefit to the region.
- ◆ Resulted in Human Resource Development and Capacity/Infrastructure Building.
- ◆ Resulted in industrial process optimization and reduced plants downs.
- ◆ Resulted in Quality bulk materials and minerals.
- ◆ Development of new and environment friendly materials.
- ◆ End - user Involvement
- ◆ Sustainability
- ◆ Economic Benefits.

Non - Destructive Testing and Evaluation - RAS/8/085

Problem

- ◆ Certification of integrity and quality of critical industrial components and assemblies essential to avoid their premature failure or rejection.
- ◆ Economic losses due to rejection of un - reliable/ sub-standard traded materials
- ◆ Availability of trained manpower essential to carry out such inspections.
- ◆ Harmonization of training schemes between the MSs and different regions essential for mutual recognition.

Non - Destructive Testing and Evaluation - RAS/8/085

Partner Organisations

- ◆ Construction and Fabrication industries for steel structures, concrete structures, pipelines, pressure vessels etc.
- ◆ Self funding and also by Government agencies

Non - Destructive Testing and Evaluation - RAS/8/085

Techniques Applied

- ◆ Gamma radiography, Digital radiology and Ultrasonic Testing including other surface/ sub - surface NDT methods
- ◆ Training courses on all NDT methods as per ISO 9712 standard and IAEA TECDOC -628

Non - Destructive Testing and Evaluation - RAS/8/085

Technical Outputs

- Technology for NDT testing for welded specimen, castings, forgings and other structures and concrete structures is now available in RCA region
- Trained manpower to carry out NDT generated in the region

Non - Destructive Testing and Evaluation - RAS/8/085

Qualitative Impact Statement

- General awareness about quality control for industrial projects has improved leading to the acceptability of these products at Regional /international levels
- Availability of trained manpower
- Creation of jobs, self-employment, small-scale fabrication industries and private inspection agencies

Non - Destructive Testing and Evaluation - RAS/8/085

Quantitative Economic Data

- Depends on type of problem and end user involved. In general, the use of NDT technology has resulted in producing quality products, has reduced the premature failures of industrial systems, saved human life, reduced pollution and resulted in millions of dollars savings to the industries.

RAS/8/085

Non - Destructive Testing and Evaluation:

Success Stories: All participating countries benefited

1. TRAINING COURSES AND QUALIFYING EXAMINATIONS ON NDT AS PER IAEA TECDOC-628 & ISO 9712
2. FABRICATION OF WELDED TEST PIECES WITH KNOWN DEFECTS AND PROFICIENCY TESTING.
3. TESTING OF CONCRETE STRUCTURES.
4. IN-SERVICE INSPECTION IN PETROLEUM INDUSTRY.

5. LEAD IN HARMONIZATION OF NDT TRAINING SCHEMES ESTABLISHED OVER OTHER REGIONS.
6. GUIDEBOOKS ON TESTING OF CONCRETE STRUCTURES AND FABRICATION OF WELDED SPECIMEN.
[IAEA Guidebooks.]
7. INITIATION OF DIGITAL RADIOLOGY TECHNIQUES.
8. PROVIDING EXPERTS/FELLOWSHIPS TO OTHER OTHER REGIONS ON REQUEST.

Process Diagnostics and Optimisation in Petro-chemical Industries - RAS/8/091

Problem

- On-line techniques essential for troubleshooting and process optimisation of industrial process systems to improve product quality and process efficiency.
- Huge economic losses due to malfunctioning and unplanned shut downs of industrial process systems.

***Process Diagnostics and Optimisation
in Petro-chemical Industries -
RAS/8/091***

Partner Organisations

- Oil and Gas, Petroleum, chemical and petrochemical, R & D and other small scale industries
- Self funding and also by Government agencies.

***Process Diagnostics and Optimisation
in Petro-chemical Industries -
RAS/8/091***

Techniques Applied

- Radiotracer and gamma transmission techniques

***Process Diagnostics and Optimisation
in Petro-chemical Industries -
RAS/8/091***

Technical Outputs

- Technology for leak/blockage location and RTD measurements now available in the Region
- Lesser dependence on advanced countries
- Gamma scanning technology established.

***Process Diagnostics and Optimisation
in Petro-chemical Industries -
RAS/8/091***

Qualitative Impact Statement

- General awareness about use of radiotracers and sealed source application in industrial process systems in the region has improved. This has led to improved design of process vessels, improved efficiency, reduced shut down times and improved product quality
- Availability of trained manpower
- Creation of jobs, self-employment, small-scale fabrication industries and private inspection agencies.

***Process Diagnostics and Optimisation
in Petro-chemical Industries -
RAS/8/091***

Quantitative Economic Data

- Depends on type of problem and end user involved. In general, the use of Radioisotope techniques for troubleshooting and process optimisation has cost to benefit ratio ranging from 1: 10 to 1: 100. The use of this technology has saved human life, reduced pollution and resulted in millions of dollars savings to the industries.

***RAS/8/091-
Process Diagnostics and Optimization in
Petro- chemical Industries***

Lead Country: India

Success Stories

Success Stories

RAS/8/091 [Contd]

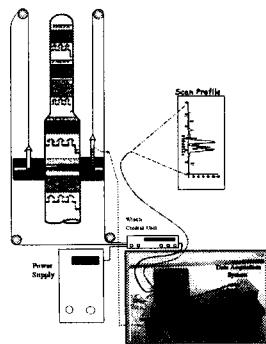
- ✓ Enhanced awareness regarding benefits of tracer technology created among potential users.
- ✓ Use of different radiotracers propagated.
- ✓ New and improved methods of column scanning have been successfully tried in actual working conditions.
- ✓ Large diameter column scanning technique successfully established.
- ✓ Technology for inspection of FCCU units initiated.

Success Stories

RAS/8/091 [Contd]

- ✓ Technology for tomography of small trickle bed reactors initiated.
- ✓ Enhanced use of Tracers in oil field investigations.
- ✓ Awareness among member states on use of CFD in process modeling created.
- ✓ Leak/ blockage location and RTD measurement methodology for pipelines and industrial systems established in most of the MSs.
- ✓ 2 Guidebooks on process optimization and use of tracers in oil field investigations published.

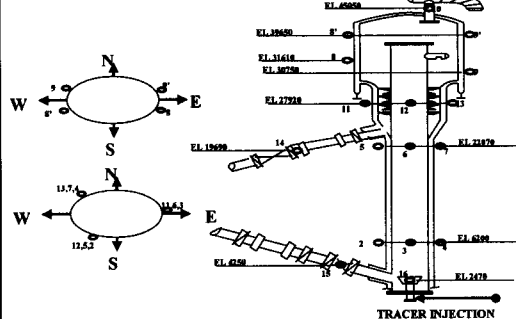
9.5 Diameter column scanned



Radiotracer Investigations in FCCU



DETECTOR LOCATIONS IN RISER & REACTOR OF FCCU

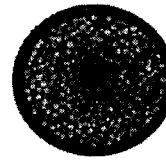


Feasibility Study on CT Scanning of Industrial Process Column

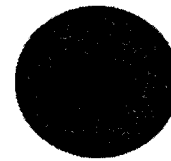
Preliminary studies on the feasibility of applying computed tomography imaging to industrial process columns were carried out using a 160 kV X-rays based experimental CT system developed for NDT applications of low-density specimen. The test specimen was a small trickle bed reactor column made of Perspex filled with alumina granules. In the initial test runs, cross-sectional CT images were obtained showing the dry and completely flooded bed with relative geometrical shapes.



Photograph of the small trickle bed reactor used in the experiment.



Dry alumina packing in 5mm thick Perspex container



Alumina packing in 5mm thick Perspex container under trickle flow

*Optimisation of materials in industry by
using on-line bulk
analysis techniques:
RAS/8/094*

Problem

- Need in minerals and processing industries for the implementation of ever-faster and more accurate technologies for on-line characterisation of materials. It is usual to monitor materials qualities by sampling. However, random samples may not be truly representative of the bulk of the material, and gauges that are able to measure all of the process flow are preferred.

*Optimisation of materials in industry by
using on-line bulk
analysis techniques:
RAS/8/094*

Partner Organisations

- The minerals mining & processing in participating Member States and associated planning Agencies.

*Optimisation of materials in industry by
using on-line bulk
analysis techniques:
RAS/8/094*

Techniques Applied

- Prompt gamma neutron activation analysis [GNAA] and Dual energy X-ray absorption [DEXA] gauges Nucleonic control systems [NCS] technology.

*Optimisation of materials in industry by
using on-line bulk
analysis techniques:
RAS/8/094*

Technical Outputs

- A demonstration centre established in Vietnam. Another planned in China
- A core of Decision makers and executives in appropriate target industries can now advise on advanced on-line bulk analysis gauges NCS technology
- The reduction in the risk and possibility of public health problems from poor quality control in processing.

*Optimisation of materials in industry by
using on-line bulk
analysis techniques:
RAS/8/094*

Qualitative Impact Statement

- General awareness created about Optimisation of industrial processes through improved in-situ, off-belt and on-line bulk analysis using PGNAA and DEXA nucleonic analysers.
- Availability of select trained manpower.

*Optimisation of materials in industry by
using on-line bulk analysis techniques:
RAS/8/094*

Quantitative Economic Data

- Trial evaluations of the technologies by industrial end-users have shown immediate economic advantages. In a study with coal blending in Australia for example, the immediate benefit has been estimated at more than \$2 million/year/mine. It has been shown that on-line quality control can be increased through the use of bulk analysis instrumentation. It is necessary to maintain tight control of minerals used in the manufacture of cement to achieve the desired strength and other properties.

RAS/8/094
Optimization of materials in industry by
using On- line bulk analysis techniques
[Old RAS/8/089]

Success Stories

1. A regional demonstration center set up in Hanoi, Vietnam.
2. Use of more versatile PGNAAs techniques initiated.
3. A new regional center planned in China.
4. Demonstration of bore hole logging and bulk materials NCS instrumentation planned.

Modification of Natural Polymers Through
Radiation Processing
- RAS/8/096

Problem

- The area of radiation processing of natural polymeric material has largely remained unexplored as most of them degraded when exposed to radiation. It has been realized that radiation processing can also be beneficially utilized either to improve the existing methodologies used for processing natural polymers or to impart value addition to such products by converting them into more useful form

Modification of Natural Polymers Through
Radiation Processing
- RAS/8/096

Partner Organisations

- The important natural polymers that have the potential to be modified include cellulose and its derivatives, chitin-chitosan, alginates, carrageenans, starch which occur abundantly in the South-east Asia region. These polymers are now being explored for potential applications in agriculture, food, medicine and cosmetic industries due to their unique structure, biodegradability, bio-compatibility and non-toxicity.

Modification of Natural Polymers Through
Radiation Processing
- RAS/8/096

Techniques Applied

- Radiation processing.

Modification of Natural Polymers Through
Radiation Processing
- RAS/8/096

Qualitative Impact Statement

- Establishing a method for extraction of chitin/chitosan from shrimp waste under the milder conditions and development of radiation-processed products containing chitin/chitosan for a variety of applications. These included development of PVA based hydrogels containing carboxymethyl chitosan for use as wound dressing .

Modification of Natural Polymers Through
Radiation Processing
- RAS/8/096

Quantitative Economic Data

- Depends on type of problem and end user involved. Needs to be worked out.

RAS/8/096
Modification of Natural Polymers
Through Radiation Processing:
[old RAS/8/090]
Lead Country: JAPAN
Success Stories

- Large field tests for irradiated alginates as plant growth promoter for various plants such as tomatoes, tea, carrots, cabbage and grapes have been completed. Radiation processed low molecular weight alginate has been established as a wholesome specific plant growth promoter with no side effects.

Modification of Natural Polymers
Through Radiation Processing
success Stories [Cont]

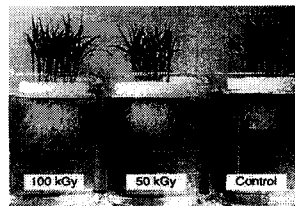
- A combined method using radiation and chemical techniques has been standardized to obtain very low molecular weight Chitin/Chitosan. The low molecular weight Chitin/Chitosan produced has been shown to possess bactericidal properties under acidic conditions. Although Chitin/Chitosan generally undergo degradation upon irradiation, conditions have been optimized to obtain crosslinked Chitosan.

Modification of Natural Polymers
Through Radiation Processing
success Stories [Cont]

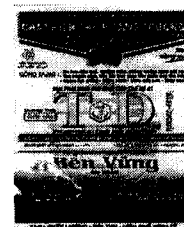
- MINT produced nearly 50,000 tons of fermented products from oil palm cellulosic waste for animal feeding test. Plans to upgrade the technology to full-scale plants.
- Philippine Nuclear Research Institute (PNRI) started the small scale project to process fermented sugarcane bagasse.
- Vietnam has commercialized the irradiated alginate as plant growth promoter.

Plant Growth Promoter from Radiation
Depolymerized Natural Polymers -
Vietnam

Promotion growth of rice plant by depolymerized alginate



Vietnam - Japan



Vietnam Commercial Product

Anti- microbial Effect of Irradiated
Chitosan - Japan

12 days



17 days

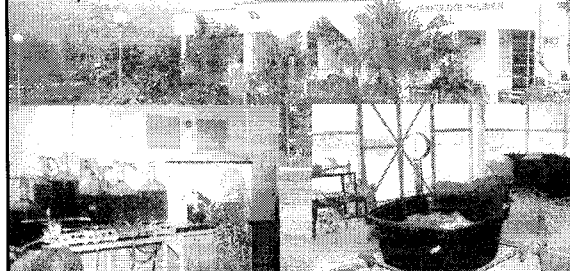


Control Irradiated Chitosan 1.5% Unirradiated Chitosan 1.5%

RADIATION PROCESSING FACILITIES:
MALAYSIAN EXPERIENCE

Agrowastes - Malaysia

STERIFEED. Animal feed plant for processing of oil palm fibers waste into animal feeds



**RADIATION PROCESSING FACILITIES:
MALAYSIAN EXPERIENCE**

Natural polymer applications - Malaysia

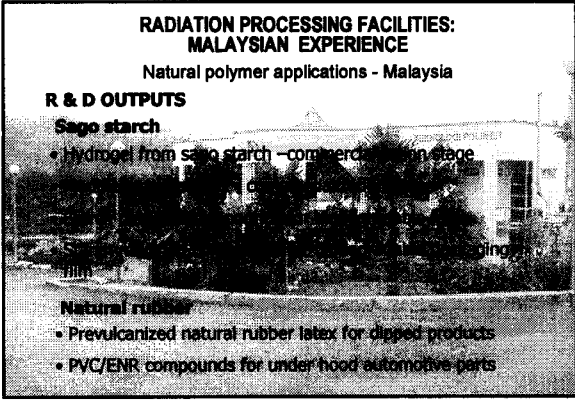
R & D OUTPUTS

Sago starch

- Hydrogel from sago starch - commercial in stage

Natural rubber

- Pre-vulcanized natural rubber latex for dipped products
- PVC/ENR compounds for under-hood automotive parts

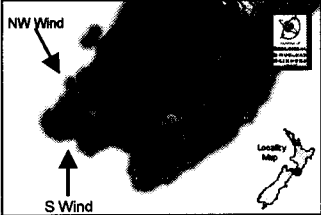


2) RCA EXPERIENCE: RCA ENVIRONMENT SECTOR – THEMATIC LEAD COUNTRY NEW ZEALAND

RCA Environment Sector – Thematic Lead Country New Zealand

Programmes (short titles):

- Urban air quality management
16 member states
- Groundwater contamination
12 member states
- Marine coastal environment
13 member states
- Geothermal water resources
10 member states
- Dam safety & sustainability
12 member states
- Environmental emergencies
5 member states



NW Wind

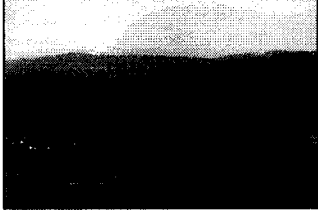
S Wind

Locality Map

→ Air pollution

RAS/7/013– Improved information of urban air quality management in the RCA region

Air pollution is identified as one of the major environmental problems in Australasia. This programme tackles local and transboundary air pollution issues.

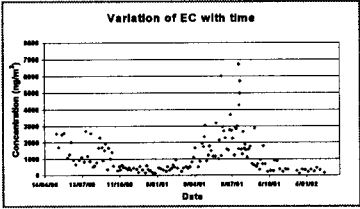


The programme focuses on the regional aspect (transboundary air pollution) after having achieved an awareness of air pollution in the RCA region. Regional interest is supported by regional action plan by ESCAP member states; also Asian countries.

→ Air pollution

SUCCESS STORIES

- o With the help of this programme, the legislation was changed in Bangladesh and the Philippines resulting in a reduction of lead in petrol.
- o Well established national programmes, like to one running in Australia, are enjoying strong government and commercial support. ANSTO in Australia has just finished a two year Australian Coal Assoc. Res. Project (ACARP) for A\$220,000.
- o Upcoming participants, such as Thailand and Sri Lanka, are having now strong links to overseas laboratories (RRUs) that enable them to measure filters on time and elements they could not access, such as Na, S, Si, Pb etc. Their national reputation is increasing resulting in leadership positions in their countries.




Variation of EC with time

Conductance (µmhos/cm)

Date


→ Groundwater pollution

RAS/8/097 – Isotope techniques for groundwater contamination studies in the urbanized and industrial areas



Similar to air pollution, groundwater pollution is one of the major issues in Australasia in environment.

Establishing access to clean water is a primary objective of all programmes running in groundwater pollution.



SUCCESS STORIES

- o This new programme is based on the previous success story of identifying arsenic (As) in groundwater (GW) in Bangladesh.
- o It focuses on the development of methodologies on GW pollution with the aim to have an impact on management decisions.
- o Regional interest is supported by regional action plan by ESCAP member states.

→ RCA programmes 05/06