

**REGIONAL CO-OPERATIVE AGREEMENT
INTERNATIONAL ATOMIC ENERGY AGENCY**

STUDY ON REGIONAL RESOURCE UNITS (RRUs)

A. K. ANAND

Former RCA National Representative, INDIA

February 2002

STUDY ON RRUs (REGIONAL RESEARCH UNITS)

1.0 Background

1.1 This report is made by the author on a service contract by the Agency. The terms of reference were as follows:

- ❖ To analyse and determine the relevance and/or usefulness of the RRUs in the RCA programme;
- ❖ To review the current method of designating RRUs and the qualification criteria, and recommend improvements;
- ❖ To identify constraints, if any, which hinders full utilization of RRUs;
- ❖ To recommend measures to increase the utilization of RRUs in the region.

1.2 Technical Cooperation Programme is a major programme of the IAEA under which many technical cooperative activities are implemented. RCA (Regional Co-operative Agreement) for the Asia-Pacific region, for Research, Development and Training related to Nuclear Science & Technology, is in force since June 1972.

1.3 Until the RCA Working Group meeting in China in 1996, the RCA programme was formulated, implemented and reviewed by the Agency through the RCA office in Vienna. During the working group meeting in China, there was a move to initiate the regional ownership of RCA programme, although earlier DDGTC had made a statement to this effect during the 24th RCA General Conference in September 1995. It was during the Working Group meeting in 1996 in China that for the first time the terminology of 'RRUs' was used. The concept of RRUs as included in the New UNDP Project Proposal and PFF (Project Formulation Framework) was discussed in detail. The concept was seen as central to the New Project Proposals achieving regional ownership and sustainability and as central to enhancing TCDC (Technical Co-operation among Developing Countries). A working group chaired by Australia was established to prepare

a paper on the selection criteria for RRUs. The working group presented its report, subsequently, this report, attached as Annexure-1, was agreed to, by the meeting. Criteria for selection/identification of RRUs have remained the same. The 'Lead Country' concept was also introduced almost at the same time for enhancing the ownership programme. During the 26th RCA GC in 1997, LC (Lead Country/Focal Points) were nominated for already defined thematic areas and new LCs were designated during the working group meeting in 1998 in New Zealand. A lot of discussion has taken place over the years on the Lead Country concept and RCA ownership and management and some documents have been prepared. These documents are 'Role of Lead Countries', 'The Lead Country Concept within the Management of RCA', Report of the Ad-hoc Committee to study the structure of RCA' and 'Transition in the RCA programme ownership and management'. 'Lead Country' concept is now working very well; LCs are chosen by consensus and is a part of the 'ownership' by the MSs. Similar formal & detailed discussion has not taken place regarding the current method of designating RRUs and their relevance/usefulness etc., although reference is made in a number of documents.

2.0 RRUs – Facilities in the NNRI (National Nuclear Research Institutes) – And their usefulness

2.1 Even prior to 1997, when the RCA programme was managed and directed by the Agency, several facilities within the NNRI (National Nuclear Research Institutes) in the developing countries had started taking leadership roles by hosting training events and accepting IAEA trainees from other countries. The developing MS started making available the local experts and the laboratories for the training events. The details can be seen in the RCA annual reports. Over the years these facilities have developed into RRUs. Though, these are called Regional Research Units, these are owned by the respective MS. After the transition to the 'regional ownership' of the RCA, the MS from the developing countries (with a pride!) have offered their facilities for the use of RCA events. Over the years, they have reduced the load on the facilities of the developed countries, who find it expensive to hold the events, as the cost of infrastructure is higher than in the developing countries. Many of these facilities have reached this level,

because of the help/assistance given by the Agency, in the form of equipment supply and manpower training. Earlier, many of the training events were held in the developed countries and for the training events being held in the developing countries, most of the experts/lecturers were drawn from the developed countries. Attached tables 1 to 4 give the details of the RCA training events held in 1997, 1998, 1999 and 2000. These include the data on the experts/lecturers called from outside the host country/IAEA. Progressive increase in the participation of the developing MS can be seen in the tables.

2.2 RRUs are considered 'pools of expertise' residing within MS and are found effective in helping the implementation of different aspects of the programme. There are several RRUs identified or volunteered for the RCA, notably in connection with the implementation of the joint UNDP/RCA/IAEA project "Better Management of the Environment, Natural Resources and Industrial Growth through Isotope and Radiation Technology." (RAS/97/030). They have been adopted as a useful mechanism to enhance regional ownership and TCDC. It is expected that additional RRUs will be identified in agriculture, health, industry, energy, etc. These RRUs had been utilized in various ways such as the following:

- **analyzing samples from MS that do not have the capability to do so** (e.g. (i) In the UNDP Sub-project "Access to Clean Drinking Water", water samples from some countries (Malaysia, Philippines, Thailand, Sri Lanka and Vietnam) were analysed at Pakistan Institute of Nuclear Science & Technology (PINSTECH), Pakistan. (ii) In the Sub-project Air-Pollution airparticulate samples collected using GENT sampler from Sri Lanka was analysed by New Zealand)
- **accepting fellows for training** (e.g. India accepts about 20 IAEA fellows per year)
- **supplying experts when needed** (e.g. India provided experts to Republic of Korea for radioisotope production)
- **providing standards or reagent kits to others countries** (e.g. (i) Polyclonal Antisera for T3, T4 and Tg RIAS were supplied to Sri Lanka by India. (ii) Under

IAEA Programme on Diabetes, India has sent RIA kits for estimating albumin in urine, to Bangladesh, Myanmar, Sri Lanka, Thailand and Vietnam)

- **hosting training/meeting events** (Examples can be seen in Attached Tables 1 to 4)
- **developing manuals/handbooks** (e.g. (i) delivery of curriculum for Tissue Bank Operators by Singapore, (ii) The comprehensive course material for “IAEA Regional Basic Professional Training Course on Radiation Protection hosted by India during October 26 to December 18, 1998” was prepared by India, as per the syllabus put together in accordance with the recommendations of ‘International Basic Safety Standards for Radiation Protection against Ionizing Radiation and for Safety of Radiation Sources (BSS), was brought out as CD form. A set of 76 practical exercises as approved by IAEA have also been prepared and now incorporated in CD form. This material is being supplied to many regional and inter-regional Member States through the Agency).

3.0 Selection/Identification and use of RRUs in the new RCA Management Structure

3.1 The ‘Lead Country’, and the project coordinators are responsible for coordinating the project and along with RRUs help to carry out training activities; there is no automatic linkage between a Lead Country and an RRU since the selection criteria for the Lead Country are not based on that country necessarily being at the highest level of technical standing for that topic.

3.2 The following is an extract from the 28th RCA GC meeting of September 1999: ‘The definition of an RRU which was agreed at the RCA WGM held in Beijing in 1996 and endorsed at the RCA GC Meeting in September 1996 remain the same’.

3.3 This is valid even now. Out of the 17 Member States of RCA, 4 are developed countries; out of the remaining 13 developing countries, 1 MS does not take ‘technical

assistance' from the Agency as this MS has her own very large full nuclear fuel cycle programme. The remaining 12 developing countries over the years have been building/improving their programme with the help of the Agency. Thus, in addition to the four developed countries, 8 of the 13 developing countries have been able to offer some of their facilities in particular fields as RRUs. Annexure-2 gives the details of 34 RRUs identified/volunteered till now. In the opinion of the National Representatives of the MSs, these RRUs meet the criteria as agreed earlier; and correctly so, because of the increased number of training events conducted in these facilities now and the number of IAEA fellowship trainees being trained. In the opinion of the author, the MS, which have large nuclear power programme, can offer many more facilities as RRUs, however, RCA programme has not suffered due to shortage of RRUs. Attached Tables 1 to 8 give the details of the training events hosted by the MS and the number of participants. Whenever the Project Committees meet and decide about the possible locations of the training events, the Project Coordinators discuss about the available facilities and the teaching faculty. In the RCA Annual Report 2000, RRUs with their expertise/specializations, under each UNDP sub-projects are listed. In some cases, teaching faculty is requested from outside the host country. In case a designated country is unable to host any training event, another country having the requisite facilities and the teaching faculty offers to host the event. All this is being done by consensus and with the help of RCA office in Vienna.

4.0 Assessment/Evaluation of earlier identified/selected RRUs

4.1 A very detailed questionnaire 'Suggested Criteria for Selecting/Evaluating Laboratories, Expertise and Facilities being, offered by MSs as RRUs, attached as Annexure-3, was prepared by RCA secretariat in March 2000 for the assessment of the earlier identified or volunteered RRUs by the MSs. Some comments were also received to modify the questionnaire. This questionnaire along with the comments from MSs was

distributed by the RCA Coordinator during the meeting of the national representative in Mumbai, India in March 2000 with the following recommendations:-

- a) It is recommended that the MS adopt this form as a way forward, to be filled up by the RRUs and other candidate RRUs and to submit the completed forms to the Secretariat not later than mid-March 2001.
- b) It is further recommended that the MS create a working group who will evaluate the forms and make recommendation to the body (RCA) for confirming/accepting the RRUs.
- c) It is also recommended that MS submit suggestions on measures to gauge the performance of the RRUs.

4.2 At the meeting in Mumbai, MS accepted those RRUs that were designated earlier. They adopted the questionnaire to be filled up the institutes, who in their own assessment qualify as RRUs. The MS agreed that the project committee/lead country will gauge the performance of the RRUs and establishing another body to evaluate their performance was not necessary.

4.3 At the briefing of Mission Representatives in August 2000 one of the representatives suggested that perhaps there should be another body that should evaluate the designation and/or performance of RRUs. All the MS of RCA through their respective project coordinators are, in fact, doing this for conducting RCA events, thus in the opinion of the author it is not necessary, again, to form another body among the MS of RCA. If the IAEA wishes to 'outsource' a project/event/analysis to one of the RRUs, it is upto the Agency to reevaluate the RRU if it wishes.

4.4 The following was recorded as para 4.3 in the report of the meeting in Bangladesh in March 2001: "The meeting was informed by the RCA coordinator that there are presently 34 RRUs and that there is a need to evaluate the "performance". It was pointed out by Australia that there are already criteria for selection and evaluation of RRUs. India pointed out that evaluation should not be discussed in this meeting but should be

left to the Project Committee. The RCA Coordinator remarked that according to the previous decisions by RCA MSs a review should be done after 2 years and Australia suggested that the Project Committee should do this evaluation soon.'

5.0 Recommendations

5.1 Identification and use of RRUs

The current method of identifying and volunteering of RRUs by the RCA national representatives, based on the qualitative criteria developed by the group formed in the Beijing meeting of 1996, is quite satisfactory. The most important point is that the volunteered RRU must be a part of a well supported national programme and it must have sufficient on going projects, to ensure that the skills are regularly used and updated. This should be established during the meetings of the Project Coordinators by asking clarifications from the representative of the MS. These RRUs should have some spare capacity during a year, so that some RCA training events can be conducted. This is an in-kind contribution to the RCA programme by the MSs. This practice is being followed and should continue. These RRUs should not be used as money making facilities by the MSs for the RCA programme. For the non-RCA programme, if the Agency wishes to 'outsource' some projects/events to any of these RRUs, it should be done at the discretion of the Agency as explained above in 4.3. However, this should not be cited as a reason, to refuse holding an RCA event by the MS, otherwise the regional ownership of the RCA programme, which has started functioning well, will start declining. RCA funding is not used to upgrade these RRUs with new equipment; this may be done independently by the Agency under national technical cooperation programme of the MS with the Agency.

5.2 Upgradation of RRUs & Updating the list of RRUs

The project coordinators in their meetings should continue to discuss about hosting the training events vis-à-vis the facilities in the RRUs. This will automatically

send a signal through the project coordinator to a particular RRU for up-gradation. This will also help the national programme of the MS, which is considered of primary importance. Thus the job of updating the list of RRUs in particular field can be assigned to the project coordinators; this feedback can be given to the national representatives who can formally approve the consolidated list once in 2 years during their annual meeting. Feed back from the participants of the training events can be collected by the technical officer of the Agency, which can also be passed on to the national representatives through the RCA office. This updated list can be given to the Training Section of the Agency for drawing experts for non-RCA events, for outsourcing and for sending IAEA fellows for training. In the opinion of the author, based on his experience, IAEA fellows from developing countries feel more 'at home' in other developing countries.

5.3 Independent Evaluation

There is no need for any other independent evaluation for accepting/rejecting the RRUs as elaborated above in 4.3 & 5.1. If a facility in a NNRI of a developing MS reaches a reasonable level, which is difficult to quantify, but can be assessed during the meeting of the Project Coordinators, a training event can be hosted by the MS, so that there is a further incentive to upgrade the facility, either before the event or during the event so that the facility can be later recognized as RRU. Subsequently this RRU can also become a part of the 'pool' from where analysis can be done, experts can be drawn and where IAEA fellows can be sent for training at comparatively lesser cost. This is in the spirit of TCDC.

5.4 Full Utilization of RRUs

Basically it should be left to the Member States to improve the utilization of their facilities/ RRUs by the national programme. They should not look towards the Agency for utilizing the RRUs; the use by other MS or by the Agency should be seen only as an additionality. This is how the developing MS will become developed in Nuclear Science & Technology, which in the opinion of the author, should be the ultimate aim of a

Annex 21

country. There may be an exception, when the facility/RRU has been set-up, with the funding from the IAEA, and is being underutilized by the MS; only in such exceptional case, the Agency can persuade the MS to offer the use of the RRU to the Agency or other MS, at a nominal cost. This initiative should be taken by the Agency.

No. of Participants for RCA Training Events during 1997

Table-5

Sr.	Member State	Nuclear Power	Res. Reactor	Agriculture	Health	Industry	Environment	Waste Manag.	Rad. Prot	TCDC/ General	Total		Total
											m	f	
1.	Australia										0	0	0
2.	Bangladesh	2m			3m	4m 1f			3m		12	1	13
3.	China	7m			8m 1f	5m			1m		21	1	22
4.	India	3m			4m 2f	6m			2m 2f		15	4	19
5.	Indonesia	6m			1m 2f	5m 1f			1m 1f		13	4	17
6.	Japan										0	0	0
7.	Korea Rep.of	6m			3m	4m			1m 2f		14	2	16
8.	Malaysia	3m 1f			3m	5m 2f			3m		14	3	17
9.	Mongolia					1m			1m		2	0	2
10.	Myanmar	1m			1m	1m					3	0	3
11.	New Zealand										0	0	0
12.	Pakistan	5m 1f			1m1f	4m			1m 1f		11	3	14
13.	Philippines	7m			1m 2f	2m 3f			2f		10	7	17
14.	Singapore					4m 1f			1f		4	2	6
15.	Sri Lanka	3m 2f			1m	4m 1f			1f		8	4	12
16.	Thailand	3m 1f			2m 1f	3m 2f			1f		8	5	13
17.	Vietnam	6m			1m	2m 1f			3m		12	1	13
											147	37	184

No. of Participants for RCA Training Events during 1998

Table-6

Sr.	Member State	Nuclear Power	Res. Reactor	Agriculture	Health	Industry	Environment	Waste Manag.	Rad. Prot	TCDC/ General	Total		Total
											m	f	
1.	Australia								3m		3	0	3
2.	Bangladesh	5m		1m	8m 5f	5m	1m	1m	1f		21	6	27
3.	China	6m 1f		3m 1f	6m 9f	8m 1f	1m 1f	2m	6m 1f		32	14	46
4.	India	7m		2m	7m 6f	5m 1f	3m	1m	4m		29	7	36
5.	Indonesia	8m		1m 1f	5m 6f	5m	1m 2f	2m	1m		23	9	32
6.	Japan								2m		2	0	2
7.	Korea Rep.of	1m			11m 3f	5m	4m		7m		28	3	31
8.	Malaysia	3m 3f		1m 3f	9m 1f	5m	3f	1m 1f	3m 1f		22	12	34
9.	Mongolia				1m 7f	3m		1m	1m		6	7	13
10.	Myanmar			1f	1m 1f	2m	1m		1f		4	3	7
11.	New Zealand										0	0	0
12.	Pakistan	7m 1f		3m 1f	6m 2f	7m	3m	2m	4m 2f		32	6	38
13.	Philippines	4m 1f		3f	11m 3f	6m	2m 4f	2f	1m 2f		24	15	39
14.	Singapore			1m	3m	1m		1m			6	0	6
15.	Sri Lanka	2m		1m 1f	11m 3f	5m	4m	2m			25	4	29
16.	Thailand	5m 1f		1m 1f	2m 9f	6m	3m 3f	1m 1f	1m		19	15	34
17.	Vietnam	5m 1f		1m 2f	14m 3f	7m	4m	1m	1m		33	6	39
											309	107	416

No. of Participants for RCA Training Events during 1999

Table-7

Sr.	Member State	Nuclear Power	Res. Reactor	Agriculture	Health	Industry	Environment	Waste Manag.	Rad. Prot	TCDC/ General	Total		Total
											m	f	
1.	Australia										0	0	
2.	Bangladesh			2m	9m 5f	6m			7m 1f	2m 2f	26	8	34
3.	China	2m		1m 1f	13m 5f	7m	8m 1f		4m 1f	1m 1f	37	9	46
4.	India			2m	8m 9f	9m	3m 1f		6m	1m	29	10	39
5.	Indonesia	2m		3f	10m 5f	6m 2f	6m 3f		4m 2f	3m	31	15	46
6.	Japan										0	0	0
7.	Korea Rep.of	2m		1m	5m 1f	6m	4m		9m	3m	30	1	31
8.	Malaysia	2m		4m 1f	9m 3f	5m	8m 1f		6m 1f	3m 1f	37	7	44
9.	Mongolia	1m 1f			3m 8f	3m 1f			1m	3m 1f	11	11	22
10.	Myanmar	1m		2m 1f	3m 3f	2m			2f	1m 3f	8	9	17
11.	New Zealand										0	0	0
12.	Pakistan	3m 1f		1f	10m 3f	5m	9m		7m 1f	2m	36	6	42
13.	Philippines	1m 1f		2f	7m 7f	7m 3f	2m 10f		7m 5f	1m 2f	35	28	63
14.	Singapore			1f	2m 1f	1m			1f	1m	4	3	7
15.	Sri Lanka	2m		4m 1f	5m 2f	3m 2f	3m 2f		2m 2f	2m 2f	21	11	32
16.	Thailand			2m 3f	4m 10f	8m 2f	8m 5f		8m 1f	1m 2f	31	23	54
17.	Vietnam	1m 1f		4m 1f	12m 4f	8m	5m 1f		6m	5m 2f	41	9	50
											377	150	527

No. of Participants for RCA Training Events during 2000

Table-8

Sr.	Member State	Nuclear Power	Res. Reactor	Agriculture	Health	Industry	Environment	Waste Manag.	Rad. Prot	TCDC/ General	Total		Total
											m	f	
1.	Australia										0	0	0
2.	Bangladesh	2m	4m	2m	13m 2f	3m	8m		6m 1f	1m	41	3	44
3.	China	3m 1f	3m	7m 2f	12m 2f	6m 1f	7m 2f		7m 1f		45	9	54
4.	India	3m	3m	1m 1f	12m 5f	5m	5m 2f		8m 1f		37	9	46
5.	Indonesia	6m 1f	3m	2m 2f	13m 5f	7m 2f	9m 2f		3m 7f		43	19	62
6.	Japan										0	0	0
7.	Korea Rep.of	4m	2m	1m	16m 2f	7m 1f	13m 1f		10m 4ml		53	4	57
8.	Malaysia	1m 1f	1m	5m 1f	14m 4f	5m 1f	12m 1f		9m 2f		47	10	57
9.	Mongolia			1m 1f	5m 8f	2m			5m	1m	14	9	23
10.	Myanmar			3f	3m 2f	1m 2f	1m		2m 1f	2f	7	10	17
11.	New Zealand										0	0	0
12.	Pakistan	2m 1f	3m	3m	7m 6f	9m	12m		5m 1f		41	8	49
13.	Philippines	1m 1f	1m	2m 4f	9m 6f	2m 4f	3m 11f		6m 6f		24	32	56
14.	Singapore	1m		1m 1f	6m				2m 1f		10	2	12
15.	Sri Lanka	2m		2m 1f	11m 4f	5m 1f	10m 1f		4m 1f	2f	34	10	44
16.	Thailand	1m	3m	3m 5f	4m 15f	4m 5f	6m 2f		5m 10f	1m 1f	27	38	65
17.	Vietnam	4m 1f	3m	3m 2f	13m 1f	9m 2f	10m 1f		6m	1m 4f	49	11	60
											472	174	646

REGIONAL RESOURCE UNITS

Regional Resource Units (RRU) are identified in the new UNDP Project as:

- ❖ being a well-established expert group within a national organization, normally a NNRI;
- ❖ being in either a developed or developing Member State;
- ❖ being able to exercise a leadership role in projects/part projects through having high quality capabilities (e.g. analysis, tracer services, etc.) which are available for use within the region;
- ❖ attuned to the needs of end-users, such as local companies, government organizations, etc;
- ❖ able to carry out IAEA contracts, provide “hands on” training for other Member States (TCDC), assess project proposals, etc.

The new UNDP project document suggests selection criteria for RRUs should include:

- ❖ willingness to share in regional activities;
- ❖ scientific excellence in a technique (publication record, modern equipment, standards of measurements, etc.);
- ❖ a suitable number of trained staff;
- ❖ sufficient ongoing projects to ensure that skills are regularly used and updated;
- ❖ part of a well-supported national programme;
- ❖ administratively well-supported within their NNRI.

A RRU is not

- ❖ likely to be a recipient of UNDP funding to improve its facilities or expertise
- ❖ a UNDP Regional Resource Centre (RRC) which has administrative as well as technical functions (see Background Doc. Part I, Annex 2.4.5, page 9);
- ❖ a Centre of Excellence, which is generally less applied and more research-oriented.

RRUs are consistent with Agency and UNDP suggestions for greater focus on the use of expertise within the regional, greater responsibility for management within the region, increased numbers of activities/experts based in developing countries and greater TCDC.

RRUs effectively exist already and recognizing and utilizing them will help move the RCA forward in areas of TCDC, training and greater management skills in the region. RRUs reflect one aspect of the diversity of skills in the RCA and are a natural progression as the RCA matures.

J. Rolland, Australia

S. Gangadharan, India

C. Aleta, Philippines

A. Sobri, Malaysia

H.L. Chang, Republic of Korea

Regional Resource Units (RRUs)

Total RRUs available: 34

Under the joint UNDP/RCA/IAEA Project : 28

Access to clean drinking water: 3
Marine coastal environment and its pollution: 8
Air pollution and its trends: 8
Clean and energy efficient production processes: 4
Electronic networking and outreach: 5

Under non-UNDP areas: 6

Health:
 Tissue Banking: 2
 Neonatal screening: 1
Geothermal exploration: 1
Dam safety: 1
Gamma irradiation services: 1

RRUs under Joint UNDP/RCA/IAEA Project RAS/97/030

Sub-project Output	RRUs	Country	Address
1.1	BARC	India	Bhabha Atomic Research Centre (BARC) - to provide analytical service for isotopes and expert services in isotope hydrology Mumbai 400085 Tel: 91 22 550 5050 ext. 2717 Fax: 91 22 550 5151 E-mail: Contact person: Name: Dr. S.V. Navada Title: Head, Isotope Hydrology Section Dept.: Isotope Applications Division, Address: Bhabha Atomic Research Centre Trombay, Mumbai-400 085
1.1	KAERI	Republic of Korea	Korea Atomic Energy Research Institute - KAERI - to provide hosting for trainings on isotopic analysis and hydrological data interpretation 150 Duckin-dong, Yusong-ku 305-353, Taejon Tel: 82 42 868 2063 Fax: 82 42 868 2063 E-mail: ncskim1@nanum.kaeri.re.kr Contact person: Name: Chun-Soo KIM (Mr) Title: Principal Researcher (Hydrologist) Dept.: Geoenvironmental Sciences Section Radioactive Disposal Research Team, KAERI Address: PO Box 105 Yusong Taejon, Republic of Korea, 305 - 600
1.1	PINST-ECH	Pakistan	Pakistan Institute of Nuclear Science & Technology (PINSTECH) - to provide analytical services for isotopes PO Box. Nilore Islamabad Tel: 92 51 929 0261 Fax: 92 51 929 0275 E-mail: pinstech@paknet2.ptc.pk Contact person: Name: Dr. M. Ishaq Sajjad Title: Head, Radiation and Isotope Application Division Dept.: PINSTECH/ PAEA E-mail: sajjad.pins@pearl3.dgcc.org.pk

Sub-project Output	RRUs	Country	Address
1.2	ANSTO	Australia	<p>RRU for Component 1 - Regional Data Base for Marine Radioactivity</p> <p>Contact Person: Name: Dr Ross Jeffree Dept. :Environment Division Address: Australian Nuclear Science and Technology Organisation (ANSTO) PMB 1, Menai NSW 2234 Australia Telephone: 612 9717 3584 Fax: 612 9717 9260 E-mail: ross.jeffree@ansto.gov.au</p> <p>Output 1.2: RRU for Component 2 - Fate and Behaviour of Pollutants</p> <p>Contact Person: Name: Dr Ron Szymczak Dept. :Environment Division Address: Australian Nuclear Science and Technology Organisation (ANSTO) PMB 1, Menai NSW 2234 Australia Telephone: 612 9717-9221 Fax: 612 9717 9260 E-mail: ron.szymczak@ansto.gov.au</p> <p>Output 1.2: RRU for Component 3 - Off-shore Modelling and Verification</p> <p>Contact Person : Name: Dr Peter Airey Dept. : Environment Division Address: Australian Nuclear Science and Technology Organisation (ANSTO) PMB 1, Menai NSW 2234 Australia Telephone: 612 9717 3272</p>

Sub-project Output	RRUs	Country	Address
			<p>Fax: 612 9717 9293 E-mail: peter.airey@ansto.gov.au</p> <p>Output 1.2: RRU for Component 4 – Harmful Algal Blooms Concerns</p> <p>Contact Person : Name: Dr Henk Heijnis Dept. : Environment Division Address: Australian Nuclear Science and Technology Organisation (ANSTO) PMB 1, Menai NSW 2234 Australia Telephone: 612 9717 3209: Fax: 612 9717 9270 E-mail: henk.heijnis@ansto.gov.au</p> <p>Output 1.2: RRU for Component 4 – Harmful Algal Blooms Concerns</p> <p>Contact Person: Name: Ms. Elvira Z. Sombrito Section Head, Chemistry Research Section Philippine Nuclear Research Institute Telephone: +632 9201655, 9296011-19 Fax: +632 9201646 E-mail: ezs@asti.dost.gov.ph or ezsombrito@yahoo.com</p>
1.2	BARC	India	<p>Bhabha Atomic Research Centre (BARC) - Tracer technology Mumbai 400085 Tel: 91 22 550 5050 ext. 2717 Fax: 91 22 550 5151 E-mail: Contact person: Name: Dr. S.V. Navada Title: Head, Isotope Hydrology Section Dept.: Isotope Applications Division, Address: Bhabha Atomic Research Centre Trombay, Mumbai-400 085</p>
1.2	MINT	Malaysia	<p>Output 1.2 : RRU for Database on heavy metals and organic pollutants Malaysian Institute of Nuclear Research & Technology (MINT) Bangi, 43000 Kajang, Selangor Tel: 603 8250510 Ext. 1130</p>

Sub-project Output	RRUs	Country	Address
			Fax: 603 825 2577 E-mail: khalik_wood@mint.gov.my Contact person: Name: Dr. Abd. Khalik Hj. Wood Title: Senior Research Officer Dept.: Industrial Technology Division (MINT) Address: MINT
1.2	PINST-ECH	Pakistan	Pakistan Institute of Nuclear Science & Technology (PINSTECH) - C-14 and stable isotope techniques for component 2. PO Box. Nilore Islamabad Tel: 92 51 929 0261 Fax: 92 51 929 0275 E-mail: pinstech@paknet2.ptc.pk Contact person: Name: Dr. M. Ishaq Sajjad Title: Head, Radiation and Isotope Application Division Dept.: PINSTECH/ PAEA E-mail: sajjad.pins@pearl3.dgcc.org.pk
1.2	MSI	Philippines	Marine Sciences Institute (for description defining the scientific or technical contribution(s) being made, such as tracing, PIXE, NAA, etc, processing of shellfish samples for the extraction of total saxitoxin that would help make available PSP toxin standards, particularly 3H-saxitoxin, to MSs isolation and culture of algal cells and cysts quantification of algal cysts in sediment cores modeling of toxic red tides) University of the Philippines Contact Person: Rhodora V. Azanza, Ph.D. Address: Marine Science Institute University of the Philippines Diliman, Quezon City 1101 Telefax: 00632 921-5967 Email: rhod@msi01.cs.upd.edu.ph
1.3	ANSTO	Australia	RRU for PIXE Contact Person: Name: Dr David Cohen Dept. :Physics Division Address: Australian Nuclear Science and Technology Organisation

Sub-project Output	RRUs	Country	Address
			(ANSTO) PMB 1, Menai NSW 2234 Australia Telephone: 612 9717 3042 Fax: 612 9717 3257 E-mail: david.cohen@ansto.gov.au
1.3	CIAE	China	RRU for NAA China Institute of Atomic Energy PO Box. 275 - 50 Beijing 102413, China Tel: 86 10 6935 7308 Fax: 86 10 6935 7008 E-mail: tiancia@public.bta.net.cn or wztian@iris.ciae.ac.cn Contact person: Name: Tian Weizhi Title: Professor Dept.: Nuclear Physics Address: CIAE
1.3	BARC & CCCM	India	For NAA and XRF <u>BARC Address :</u> Bhabha Atomic Research Centre (BARC) Mumbai 400085 Tel: 91 22 550 5050 ext. 2215 Fax: 91 22 550 5151 E-mail: Contact person: Name: Dr. T.M. Mahadevan Title: Scientific Officer Dept.: Environment & Assessment Division Address: Bhabha Atomic Research Centre (BARC) <u>CCCM address:</u> Centre for Compositional Characterisation of Materials (CCCM), ECIL Post, Hyderabad-500 062. Tel: 91 040 712 5462 Fax: 91 040 712 5463 <u>At Mumbai:</u> Tel: 91 22 557 4363 Fax: 91 22 556 2161 E-mail:

Sub-project Output	RRUs	Country	Address
			Contact person: Name: Dr. S. Gangadharan Title: Project Director Dept.: Centre for Compositional Characterisation of Materials (CCCM), Address: ECIL Post, Hyderabad-500062
1.3	BATAN	Indonesia	RRU for Air pollution (NAA) BATAN - National Atomic Energy Agency Indonesia PPI-Batan, Kawasan PUSPITEK Serpong, Tangerang 15310 Tel: 62 21 7560905 Fax: 62 21 7560923 E-mail: syamsa@batan.go.id / PCM helia@ibm.net Contact person: Name: Title: Dept.: Address:
1.3	GNS	New Zealand	RRU for Ion Beam Technologies Institute of Geological & Nuclear Sciences (GNS) PO Box 31-312 Lower Hutt Tel: 64 4 570 4637 Fax: 64 4 570 4657 E-mail: Contact person: Name: Title: Dept.: Address: P O Box 33-224, Petone, New Zealand Alternative contact:
1.3	PINST-ECH	Pakistan	Air pollution (NAA) Pakistan Institute of Nuclear Science & Technology (PINSTECH) PO Box. Nilore Islamabad Tel: 92 51 929 0261 Fax: 92 51 929 0275 E-mail: pinstech@paknet2.ptc.pk Contact person: Name: Dr. Shujaat Ahmad Title: Head, Dept.: Analytical Chemistry Group, Nuclear Chemistry Division Address: E-mail: shujaat.pins@pearl3.dgcc.org.pk
1.3	NUS	Singapore	RRU for Air pollution - PIXE / XRF National University of Singapore (NUS) Dept. Of Physics Lower Kent Ridge Rd

Sub-project Output	RRUs	Country	Address
			Singapore 119260 Tel: 65 8742620 Fax: 65 7776126 Contact person: Name: Prof. Dr. Tang Seung Mun Title: Professor Dept.: Department of Physics Address: NUS E-mail: phytsm@leonis.nus.edu.sg
1.4	BARC	India	RRU for Nucleonic Control Systems & Tracers Bhabha Atomic Research Centre (BARC) Mumbai 400085 Tel: 91 22 550 5161 Fax: 91 22 550 5151 E-mail: Contact person: Name: Mr. Gursharan Singh Title: Head, NDT, Tracer Technology & Hot Cell Operations. Dept.: Isotope Applications Division Address: Bhabha Atomic Research Centre Trombay, Mumbai-400 085.
1.4	JAERI	Japan	RRU for Component 1- Agrowaste Japan Atomic Energy Research Institute - JAERI 1233 Watanuki, Takasaki, Gunma 270-12 Tel: 81 27 3469410 Fax: 81 27 3469687 E-mail: kume@taka.jaeri.go.jp Contact person: Name: Dr. Tamikazu KUME Title: Head Dept.: Material Development Address: same as above
1.4	MINT	Malaysia	RRU for Component 1- Agrowaste Malaysian Institute of Nuclear Research & Technology (MINT) Bangi, 43000 Kajang, Selangor Tel: 603 8250510 Ext. 1130 Fax: 603 825 2577 E-mail: khalik_wood@mint.gov.my Contact person: Name: Dr. Mat Rasol Awang Title: Senior Research Officer Dept.: Radiation Processing Technology Division Address: MINT as above Tel: Ext 1403; E-mail: rasol@mint.gov.my

Sub-project Output	RRUs	Country	Address
1.4	GNS	New Zealand	<p>RRU for Component 2 - Industrial efficiency (Tracers, Sealed Sources and Nucleonic Gauges) Institute of Geological & Nuclear Sciences (GNS) PO Box 31-312 Lower Hutt Tel: 64 4 570 4637 Fax: 64 4 570 4657 E-mail: G.Wallace@gns.cri.nz Contact person: Name: G Wallace Title: Dr Dept.: Address: GNS as above</p>
2.1	ANSTO	Australia	<p><i>RRU for Component 4 – Distance Learning Materials</i> Contact Person: Name: Celia Hacker Dept.: Safety Division Address: Australian Nuclear Science and Technology Organisation (ANSTO) PMB 1, Menai NSW 2234 Australia Telephone: 612 9717 3560 Fax: 612 9717 9266 E-mail: celia.hacker@ansto.gov.au</p> <p>RRU for Component 5 – Emergency Response Training Contact Person: Name: David Woods Dept. : Safety Division Address: Australian Nuclear Science and Technology Organisation (ANSTO) PMB 1, Menai NSW 2234 Australia Telephone: 612 9717 3578 Fax: 612 9717 9266 E-mail: david.woods@ansto.gov.au</p>
2.1	CIAE	China	<p>RRU for Component 1 - Internet & Homepage China Institute of Atomic Energy PO Box. 275 - 50</p>

Sub-project Output	RRUs	Country	Address
			Beijing 102413, China Tel: 86 10 6935 7308 Fax: 86 10 6935 7008 E-mail: tiancia@public.bta.net.cn or wztian@iris.ciae.ac.cn Contact person: Name: Tian Weizhi Title: Professor Dept.: Nuclear Physics Address: CIAE
2.1	BARC	India	RRU for Component 1 - Networking (offer) Bhabha Atomic Research Centre (BARC) Mumbai 400085 Tel: 91 22 550 5050 ext. 2827 Fax: 91 22 550 5151 E-mail: Contact person: Name: C.A. Krishnan Title: RCA Liaison Officer Dept.: Technical Co-ordination & International Relations Group Address: Bhabha Atomic Research Centre (BARC)
2.1	MINT	Malaysia	RRU for Components 1, 2, 3 - Internet & Homepage Malaysian Institute of Nuclear Research & Technology (MINT) Bangi, 43000 Kajang, Selangor Tel: 603 8250510 Fax: 603 825 2577 Contact person: Name: Mr. Abd. Muin Abd. Rahman Title: Senior Research Officer Dept.: Radiation Processing Technology Division Address: MINT as above Tel. Ext: 1240; E-mail: muin@mint.gov.my

Proposed RRUs for non-UNDP areas

Sr	Project No.	Area/Field	Institute	Country	Address
1	RAS7008	Tissue Banking	Bangkok Biomaterial Center	Thailand	Bangkok Biomaterial Center, Mahidol University, Bangkok.
2		Gamma Irradiation Services	GISC	Thailand	Gamma Irradiation Service and Nuclear Technology Research Center (GISC), Kasetsart University, Bangkok, Thailand.
3	RAS6028	Health/Neonatal screening	Radioisotope Laboratory at NIH	Thailand	Radioisotope Laboratory at NIH
4	RAS7008	Training Centre for Tissue Banking	National University Hospital	Singapore	National University Hospital, Singapore.
5	RAS8092	Geothermal exploration.	Geothermal division, PNOC	Philippines	Philippine National Oil Company (PNOC).
6	RAS8093	Dam Safety	PINSTECH	Pakistan	PINSTECH, Islamabad



**REGIONAL COOPERATIVE AGREEMENT FOR TRAINING, RESEARCH
AND DEVELOPMENT IN NUCLEAR SCIENCE AND TECHNOLOGY
(RCA)**

**SUGGESTED CRITERIA FOR * SELECTING/EVALUATING
REGIONAL RESOURCE UNITS (RRUs) IN THE RCA PROGRAMME**

IAEA, Vienna

March 2000

* At the 1996 RCA Meeting of Representatives held in Beijing, China, the RCA Member States agreed on the establishment of RRUs in the RCA. RRUs were first designated under the joint UNDP/RCA/IAEA project (RAS/97/030). With the increase in interest from many Member States to be RRUs, a set of criteria on the evaluation of performance of RRUs was prepared. The suggested Criteria for Selecting/Evaluating Regional Resource Units (RRUs) in the RCA Programme was adopted at the 22nd RCA Meeting of National Representatives held in Mumbai, India, in Feb/March 2000. Designated RRUs, or those offering to be RRUs, are required to fill the questionnaire for circulation to all RCA MSs. --- RCA Coordinator, 7 March 2001

Suggested Criteria for Selecting/Evaluating Regional Resource Units (RRUs) in the RCA Programme

1) Background:

Since 1995 the RCA MS have been implementing various measures which resulted in an increase in the ownership of the RCA programme. In 1996 they suggested the concept of lead countries for the programme and initiated the development of operating rules and guidelines governing the programming and implementation of the RCA programme. At the 1996 RCA Meeting of Representatives held in Beijing, China, the RCA Member States agreed on the establishment of RRUs in the RCA. The definition and criteria for RRUs are as in Annex 1. (copy)

The identification of RRUs has been a main objective of as well as an indicator of success for the joint UNDP/RCA/IAEA project (RAS 97/030). Under the project, RRUs had been designated or assigned by MS for the various subprojects during the project formulation meetings of these subprojects held in February and March 1998.

The Agency also recognized the importance of RRUs, which it generally considers as Centers of Excellence¹

An agency paper on this is attached as Annex 2.

At the 28th RCA General Conference held on September 1999 in Vienna, Austria the RCA MS received further list of proposals for RRUs and contact persons.

With the increase in interest from many Member States to be RRUs the Meeting asked the Secretariat to elaborate further on the roles and functions of RRUs and prepare criteria on the evaluation of performance of the RRUs.

In response to these requests a draft questionnaire was prepared by the RCA Secretariat and circulated to selected MS that had been earlier identified or volunteered as RRUs, for their comments. The form is intended to be filled up by the existing or prospective RRUs—it is designed to include those information that meets the criteria for RRUs as agreed upon earlier (refer to first paragraph above) and would facilitate evaluation of such candidate or the performance of an already designated RRU. The questionnaire was sent on 7 December with a deadline of 30 December 1999.

2) Results of the survey

The Secretariat received 6 replies from the following countries: AUL, IND, MAL, PHINZE and SIN.

¹ In AFRA they have the AFRA-designated centers of excellence and ARCAL has centers of excellence.

The following are some of the comments:

- the format must reflect the measure of the criteria for RRU elaborated in the RCA WGM in Beijing in May 1996 (AUL);
- the format as circulated is not really going to measure the performance of the RRUs but could be used to identify or select them (NZE);
- the information on whether an RRU is delivering good quality facilities to MS would be from the evaluation of the people in MS who utilized those facilities /services (NZE);
- there is a need to find ways to incorporate the evaluation forms filled in by participants of training courses and adding to it a questionnaire to the users of laboratory or other services(NZE);
- System weight (percentage points) should be included(MAL); and
- Certification facilities be included to cater to facilities certifying personnel (SIN)

Comments were also received on modification of the form.(SIN , INS, AUL)

As a result of these comments the form has been revised.

The form is not intended to evaluate the performance of the RRUs but to be used as an aid in identifying and selecting them. Additional items will be solicited from MS for measuring the performance of the RRUs. No weighting system is envisioned but MS could make suggestions.

3) Recommendations:

- a. It is recommended that the MS adopt this form as a way forward, to be filled up by the RRUs and other candidate RRUs and to submit the completed forms to the Secretariat not later than mid-March 2000.
- b. It is further recommended that the MS create a working group who will evaluate the forms and make recommendation to the body (RCA) for confirming/accepting the RRUs.
- c. It is also recommended that MS submit suggestions on measures to gauge the performance of the RRUs.

Suggested Criteria for Selecting/Evaluating Laboratories, Expertise and Facilities being offered by Member States as Regional Resource Units(RRUs)

Part A

1. Title of RCA project and Project number	
2. Proposed RRU:	
Field of work: Description of proposed RRU's area of expertise(include a descriptor defining the scientific or technical contribution(s) being made, such as tracing, PIXE, NAA, etc)	
Contact Person's name and contact details (telephone, fax, email)	
Host institute's name	
Country	
3. Ability to accept the responsibility of an RRU	

REGIONAL RESOURCE UNITS

The concept of a Regional Resource Units (RRU) was developed to recognise that in RCA Member States, the national and international investments to establish and improve nuclear science and technology have often developed across the region in pockets of high level scientific and technical expertise, based around their investments in manpower and equipment. These resources have generally not being acknowledged for their achievements and more importantly have not being utilised to any significant degree for the benefit of the RCA Programme. The introduction of RRUs into the RCA programme was seen to have the potential to make a significant increase in TCDC; to increase the sustainability of nuclear science and technology at a regional level for Member States; to increase the “ownership” of projects by Member States; and as a cost effective mechanism to deliver project activities.

The definition of an RRU was agreed at the RCA WGM held in Beijing in May 1996 and endorsed at the RCA GCM in September 1996 and remains:

- a well-established expert group within a national organization, normally a NNRI;
- being in either a developed or developing Member State;
- being able to exercise a leadership role in projects/part projects through having high quality capabilities (eg analysis, tracer services, etc) which are available for use within the region;

- attuned to the needs of technology end-users, such as local companies, government organisations, etc; and
- able to carry out IAEA contracts, provide “hands on” training for other Member States (TCDC), assess project proposals, etc.

The criteria for RRUs should include:

- willingness to share in regional activities;
- scientific excellence in a technique (publication record, modern equipment, standards of measurements, etc);
- a suitable number of trained staff;
- sufficient ongoing projects to ensure that skills are regularly used and updated;
- part of a well-supported national programme; and
- administratively well-supported within their NNRI.

Is the host institute able to agree to the above statement on RRUs? Please indicate your answer.

Will any resources* in the proposed RRU require a fee for use by Member States? If “yes “ please specify which resources and the proposed charge.

4. Measures of Scientific Attainment

4.a List names, qualifications and experience of personnel designated for the proposed RRU and indicate whether they are full-time or part-time

4.b List any relevant scientific publications and/or reports published in the past 5 years covering the nominated specialty area of the proposed RRU

4.c List any major demonstration during the past 5 years conducted by the staff of the proposed RRU in the nominated specialty area

4.d List any major equipment purchased in last 5 years that would be available for use by MS in this RRU

* Resources could include (i) laboratories (ii) expertise (iii) training facilities (iv) certification facilities or others

4.e List any significant demonstration facilities in the proposed RRU for use

Part B.

5. Measures of Infrastructure support
5.a. What are the resources available :
i) laboratories
ii) expertise
iii) training facilities
iv) certification facilities
v) others (please specify)
i) For laboratories, please enumerate them and the techniques involved including equipment available and also identify resources funded by IAEA and other external agencies
ii) for expertise, please enumerate in which fields and number of experts available
iii) for training facilities, please enumerate number of IAEA fellows trained ___ and also audio visual or multimedia facilities, number of training rooms available lecturers, etc
iv) for certification facilities , please state the type of certification programme scheme available, type of specimens and equipment, number of examinations conducted, rooms available, examiners, etc
v) for others please specify details
5.b List any significant resources that are <u>not</u> available to support the RRU.

5.c	Will these be acquired in the next two years?
5.d	Are the available resources already offered to or used by other Member States. If “ yes” please specify.
5.e	Have other Member States used such resources in the past year?If “yes” please specify.
i)	for laboratories, the frequency or number of times used: _____.
ii)	for expertise, the number of experts involved_____ and the duration(manweeks)_____
iii)	for training facilities, the number of meeting;/training events conducted _____and number of IAEA fellows trained/attached _____number of experts involved___ and duration(manweeks)_____.
iv)	for certification facilities , the number of certification programmes conducted_____
v)	for others please specify corresponding details _____
5.f	What other projects are making use of the proposed RRU’s resources?
5.g	Are there constraints that prevent full utilization of the proposed RRU resources by other Member States? Please give your opinion.
5.h	What are the steps being taken to sustain the capability of the RRU?
i)	for laboratories, upgrading of equipment____, expansion____, additional skilled workers____, others(please specify) _____
ii)	for expertise, continuous contact with practitioners in the filed____, training new ones____,others(please specify)_____.
iii)	for training facilities, including fellowship attachment, upgrading of training equipment____, replacing old equipment_____train additional lecturers_____ others(Please specify)_____
iv)	for certification facilities, upgrading of examination materials _____replacing of old equipment and/or test specimens_____training of additional examiners _____ others(Please

specify)
Name of person completing the questionnaire: _____
Position or designation : _____
Agency
Telephone/email/fax numbers _____

Acknowledgment – The author is very grateful to Mr. C.A. Krishnan & Mr. Sushant Patil for extracting information from TC PRIDE and other documents and to Mr. E. Ravindran for typing this report.