



**INTERNATIONAL ATOMIC ENERGY AGENCY**

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**Message No:**

Page 1 of 12 total pages

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Division for Asia and the Pacific

**Addressee(s):**

National RCA Representative  
AS PER ATTACHED LIST

**External Information Copies:**

Permanent Mission  
AS PER ATTACHED LIST

**File Reference (Please quote in return correspondence):** C7-RAS8111

17-03-2010

**Subject: IAEA/RCA Training Course on Industrial Process Gamma Tomography for Multi-phase Process Investigation of Petrochemical Plants, 19-23 July, 2010, Kajang, Malaysia**

Dear National RCA Representative,

In accordance with the plan of activities of the RCA Programme in 2010 I am inviting your Government to submit nominations for the above-mentioned event, details of which and requirements for participation are given in the attached prospectus. I will also be grateful to you to complete the attached form titled "Approval of the National RCA Representative" and return it along with the completed nomination forms.

Please inform us not later than **10<sup>th</sup> of May 2010** of suitable candidates for this event with the duly completed and endorsed nomination form. Kindly note that the holding of the above Training Course will be subject to the official confirmation of the Government of Malaysia

Thank you for your cooperation.

Best regards,

Prinath Dias

RCA Focal Person

Division for Asia and the Pacific

## **International Atomic Energy Agency**

### **IAE/RCA Training Course on Industrial Process Gamma Tomography for Multi-phase Process Investigation of Petrochemical Plants**

#### **PROSPECTUS**

**Project Number**

**and Title:** RAS8111- Diagnosing Industrial Multiphase Systems by Process Visualization using Radiotracers and Sealed Sources (RCA)

**Place:** Kajang, Malaysia

**Dates:** 19-23 July 2010

**Deadline for**

**Nominations:** **10<sup>th</sup> May 2010** (Please note that it will not be possible to consider the applications received after the deadline due to administrative reasons.)

**Organizers:** The International Atomic Energy Agency (IAEA) in cooperation with the Government Malaysia, through the Malaysian Nuclear Agency

**Host Country**

**Organizer:** Dr. Jaafar Abdullah  
Division of Industrial Technology  
Malaysian Nuclear Agency  
43000 Kajang  
Selangor Darul Ehsan  
Tel.: 603-8928 2973  
Fax: 603-8925 0907  
Email: [jaafar@nuclearmalaysia.gov.my](mailto:jaafar@nuclearmalaysia.gov.my)

**Language:** English

**Purpose:** To demonstrate and train participants in using gamma process tomography and other related techniques for the investigation and diagnosing of multiphase reactors. Emphasis will be given to software and hardware of tomography systems for, data generation and acquisition, processing, image reconstruction and interpretation, as well as to demonstrate potential applications of these important technologies in petroleum & chemical industries.

**Expected**

**Output:** The expected outputs of the Training Course will be trained personnel and training materials on Industrial Process Gamma Tomography techniques for investigation of multiphase reactors. The participants are expected to make plans to apply the techniques for the investigation of multiphase

systems in their local industry. Industries in RCA MS will profit from the introduction of the nuclear technology, which has been proven to have immediate economic benefits.

**Scope and Nature:**

The course will cover both the theoretical and practical aspects of gamma process tomography and other techniques used in imaging and visualisation of multiphase systems. The participants will be trained on various aspects of computed tomography and process visualisation such as principle of process tomography, basic process engineering, measurement modalities, hardware and equipment associated with gamma tomography system and other techniques, data acquisition system, image reconstruction algorithm and data analysis. The ability of the techniques to collect experimental data for the development of proper models and the validation of CFD data will be highlighted. The limitations and advantages of industrial process tomography for real-time imaging will also be demonstrated.

**Background Information:**

Multiphase reactors are widely used in petroleum, chemical and petrochemical industries as well as in materials processing and pollution abatement. Most reactors of interest in industrial practice are opaque as they contain a large volume fraction of the dispersed phase. All the physical phenomena that affect the fluid dynamics of such systems are not yet entirely understood. This makes a priori predictions of important process parameters (pressure drop, velocity and holdup profiles, degree of back mixing, etc.) very difficult. Industry relies on correlations, and these are prone to great uncertainty as one departs from the operating conditions contained in the available limited data base. The use of gamma ray processes, tomography and other techniques for visualising, imaging and diagnosing multiphase systems will be demonstrated in this Training Course. These techniques can be used to obtain information in systems with moving catalysts of industrial interest such as gas-solid riser, liquid-solid riser and gas-liquid bubble columns. The ability of the available CFD codes to correctly predict the observed hydrodynamic quantities may be validated. With these real-time data, troubleshooting on industrial scale reactors may be further accomplished by the use of radiotracer methods.

**Participation:**

This Training Course is open for up to 20 participants from those RCA developing Member States that have activity or are interested in industrial process gamma tomography and other related technologies for multiphase process investigation of petrochemical plants. Each Member State may submit up to 2 nominations. The participants must be the members of the national project teams.

**Participants' Qualifications:**

The course is open for 1-2 candidates from each RCA developing country participating actively in the project. One participant should be from nuclear institutions engaged in radioisotope tracers and sealed source applications

and other from an end-user institute dealing with model verification, scale-up, computational fluid dynamics (CFD) validation of various process reactors in chemical and petrochemical industries. The participants should have a university degree in chemical engineering, physics, nuclear engineering, nuclear sciences, mechanical engineering or applied mathematics. As this Training Course will be conducted in English, participants must be proficient in this language and be able to understand spoken English as well as being able to express themselves in English.

**Nomination  
Procedure:**

Nominations (**including those of local participants**) should be submitted on the standard IAEA Application Form for Training Courses (available on the IAEA web-site: <http://www.iaea.org/>) Completed forms should be endorsed by relevant national authorities and returned to the Agency through official channels, i.e. the office of the National RCA Representative.

The applications should contain sufficient information to establish the nominees have the required qualifications. The nominated candidate may not be selected if sufficient information is not provided.

Applications must be received by the International Atomic Energy Agency, P. O. Box 100, A-1400 Vienna Austria, not later than **10<sup>th</sup> May 2010** Nominations received after this date or which have not been routed through established official channels, cannot be considered.

Advanced nominations through facsimile (+43-1-2600-7), or e-mail (Official@iaea.org) are welcomed. The facsimile / e-mail should contain the following basic information about the candidate: name, date of birth, academic qualifications, and current position including the exact nature of the duties carried out, proficiency in English and full contact address including telephone/email/facsimile numbers.

**Security in the  
Field:**

It is recommended that the training course participants complete the courses *Basic Security in the Field: Safety, Health and Welfare (BSITF)* and *Advanced Security in the Field (ASITF)*, prior to traveling to locations where UN security phases are in effect. The aim of these courses is to educate participants on how best to avoid or minimize potential dangers and threats, and to show what individuals can do if they find themselves in insecure situations.

The courses are available on the following UN websites that can be accessed using Microsoft Internet Explorer:

- BSITF: <http://dss.un.org/BSITF/>
- ASITF: <http://dss.un.org/ASITF/>
- 

If you have difficulty using the websites, a CD-ROM can be obtained from your IAEA National Liaison Officer or from IAEA.

Once the candidate has completed the courses and passed the accompanying exams, certificates will be generated automatically and must be printed for submission to the IAEA (either as an e-mail attachment or by fax). Copies of the certificate should be kept by the candidate for his / her records, as they are valid for a period of three years.

**Administrative  
and Financial  
Arrangements:**

Nominating Governments will be informed in due course of the names of the candidates who have been selected and will, at that time, be given full details on the procedures to be followed with regard to administrative and financial matters.

Selected participants from countries eligible to receive technical assistance will be provided with a round trip economy class air ticket from their home countries to Kajang, Malaysia and a stipend sufficient to cover the cost of their accommodation, food, and minor incidentals. Shipment of accumulated training course materials to the participants' home countries is not the responsibility of the IAEA.

The organizers of the training course do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in nominating participants, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.



Department of Technical Cooperation

<http://tc.iaea.org>**You are in :** [TC Home](#) » [Participation](#) » [As training course participant](#)

## Participating in the TC programme as a training course participant

The Agency organizes interregional and regional training courses and supports national training courses in cooperation with its Member States. Training courses are offered in different fields of peaceful uses and application of nuclear energy and nuclear technology.

The Agency takes the major responsibility for actual administration of the training courses, provision of a scientific adviser, lecturers and if applicable, of equipment. Generally invitation letters announcing these courses to relevant Member States and giving all necessary details about them are issued by the Agency.

The host country provides the Course Director and local support for training courses administration.

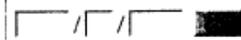
### Applying for a training course

The IAEA application forms for training course participants must be submitted to the Agency through governmental channels and priority is given to requests associated with projects of direct benefit to the Member States.

Department of  
**TECHNICAL  
COOPERATION**

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#### Project information



#### Download the Nomination Form for Training Course

As PDF

[\[English\]](#) [\[French\]](#)

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As Word

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#### Guide for Vanbreda International Insurance Scheme

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[\[Spanish\]](#)

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[Disclaimer](#)

<http://www-tc.iaea.org/tcweb/participation/astrainee/default.asp>



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 E-MAIL: Official.Mail@iaea.org, TC WEB SITE: http://www-tc.iaea.org

## NOMINATION FOR TRAINING COURSE

Note: This form cannot be used to apply for a fellowship or scientific visit

The Government of \_\_\_\_\_ nominates the following candidate for the **Training Course** on (indicate short title, place, dates, project/course number):

<input type="checkbox"/> Female <input type="checkbox"/> Male Family name: <small>(as in passport)</small> First name: <b>Complete mailing address (office):</b> Inst. Name:  Street: P.O. Box:                      Post Code: Town/City: Region/District: Country: <b>Airport/town nearest to residence:</b>	Date of birth: Place of birth: Nationality: Passport No.: Date of issue: Place of issue: Valid until: Telephone (office): Telephone (home): Fax: e-mail: WEB Page: Emergency phone:	Recent photograph of candidate
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### EDUCATION (commencing with secondary school)

Years attended		Name and place of institution	Field of study	Diploma or degree
from	to			

### RECENT EMPLOYMENT RECORD

Years of service		Name and place of employer/organization	Title of position	Type of work
from	to			

### DESCRIPTION OF WORK

Type of work done by the candidate during the past 3 years (Please attach list of any material the candidate may have published)

Is the candidate covered under a radiation surveillance programme in his/her home country?     yes     no

Has the candidate been, or will he/she be, involved in any IAEA-supported Technical Co-operation project? (Please identify project and describe the nature of the candidate's involvement.)



## REGIONAL COOPERATIVE AGREEMENT (RCA)

### INSTRUCTIONS FOR SUBMISSION OF APPLICATIONS FOR PARTICIPATION IN RCA REGIONAL TRAINING COURSES.

#### **Purpose of these instructions**

The RCA Secretariat has been facing numerous difficulties in selecting participants for RCA Regional Training Courses and making administrative arrangements for their participation, due to lack of sufficient information about the nominees. The purpose of these Instructions is to assist the nominees of RCA Regional Training Courses to provide the information needed by the RCA Secretariat for the above purposes.

#### **Purpose of RCA Regional Training Courses**

The purpose of the RCA Regional Training Courses is to provide skills and knowledge required by the participants from the RCA Member States to implement planned activities that would lead to achieving the objectives of the project under which the Training Course is held. The participants should be members of the National Project Teams engaged in implementing the relevant project, under the leadership of the National Project Coordinators. Those who are not actively engaged in project activities would not be eligible for participation. (Please see Sections 3.3 and 3.4 of RCA Guidelines and Operating Rules for further information on the responsibilities of National Project Coordinators and National Project Teams.)

#### **Instructions**

1. The information requested should be typed (preferred) or printed legibly in ink. (The Nomination Forms can be downloaded from the IAEA TC web-site <http://www-tc.iaea.org/tcweb/default.asp> if necessary).
2. Please provide sufficient information to indicate that you have the qualifications specified in the Prospectus of the Training Course. Proper descriptions of the work you are engaged in and the relevance of this training are essential in this regard. You may use additional pages as annexes if necessary.
3. Please make sure the completed Nomination Forms are submitted to the IAEA before the deadline stipulated in the Prospectus. It would not be possible to consider late nominations due to administrative reasons.
4. Please attach a copy of the BSTIF (Basic Security in the Field) certificate to your application. The details can be found in the Prospectus of the Training Course.
5. Please pay special attention to the following
  - a) Description of Work

The description of work should include the activities you are engaged in relation to the RCA project under which this Training Course is conducted. The information provided should be sufficient to indicate that you are actively engaged in implementing project activities in your country.

b) Relevance of the Training

Please indicate how this training will enable you to implement the activities of the project under which the Training Course is held, according to the National Work Plan of the project.

c) Contact Details

Please provide current and accurate contact details including your FAX and phone numbers and the e-mail address. Your name should be as it appears in your Passport. Inaccurate or illegible contact details and other information would prevent us from contacting you and making the necessary arrangements for your participation in the Training Course.

6. The Language Certificate and the Medical Certificate are mandatory
7. The Government Statement should be signed by the National RCA Representative or a person authorized by your Government to request Technical Cooperation support from the IAEA.



**REGIONAL COOPERATIVE AGREEMENT (RCA)**  
**Nomination of participants for RCA Regional Training Courses**

**Approval of the National RCA Representative**

In accordance with Section 4.2 (p) of the RCA Guidelines and Operating Rules\*, I hereby approve the nomination of .....who has been selected in consultation with the National Project Coordinator for participation in the RCA Regional Training Course on. .... The nominee is employed in a work area related to this Training Course and is a member of the National Project Team of the RCA Project under which this Training Course is held.

Name:

Signature:

Date:

**\* Section 4.2 (p) of RCA Guidelines and Operating Rules**

**4.2 Appointment, Roles and Responsibilities of National RCA Representatives**

(p) Nominate suitably qualified persons for participation in RCA events and activities in consultation with the respective National Project Coordinators and ensure that they are employed in appropriately related work areas, and are members of the Project Teams;

**National RCA Representatives**

<b>COUNTRY</b>	<b>NAME</b>	<b>FAX NUMBER</b>
<b>BANGLADESH</b>	Dr. Md. Mosharraf HOSSAIN	+880 2 8130102
<b>CHINA</b>	Mr. LIU Yongde	+86 10 885 81516
<b>INDIA</b>	Dr.B. PURNIAH	+91 22 2250 5151
<b>INDONESIA</b>	Dr. Anhar Riza ANTARIKSAWAN	+62 21 525 1110
<b>MALAYSIA</b>	Dr. Muhamad Lebai JURI	+60 3 89252588
<b>MONGOLIA</b>	Mr. Tseren DAMDINSUREN	+976 11 329019
<b>MYANMAR</b>	Dr. Ko Ko OO	+95 1 650685
<b>PAKISTAN</b>	Dr. Asif SALAHUDDIN	+92 51 920 4908
<b>PHILIPPINES</b>	Dr. Alumanda DELA ROSA	+63 2 920 1646
<b>SRI LANKA</b>	Mr. D.G.L. WICKRAMANAYAKA	+94 11 2533448
<b>THAILAND</b>	Dr. Chaivat TOSKULKAO	+662 561 4069
<b>VIETNAM</b>	Dr. Vuong Huu TAN	+84 4 3942 4133
<b>RCA Regional Office</b>	Dr. M-K Lee	+82 42 864 1626

**Permanent Missions RCA Member States**

<b>COUNTRY</b>	<b>FAX NUMBER</b>
<b>CHINA</b>	370 6626
<b>INDIA</b>	505 92 19
<b>INDONESIA</b>	479 05 57
<b>MALAYSIA</b>	505 79 42
<b>PAKISTAN</b>	367 1831 / 368 7376
<b>PHILIPPINES</b>	533240124
<b>SRI LANKA</b>	5037993
<b>THAILAND</b>	4782907
<b>VIETNAM</b>	3680754
<b>Permanent Missions Outside Vienna</b>	
<b>BANGLADESH</b>	+41 22 738 4616
<b>MYANMAR</b>	+49 30 20 61 57 20