



Regional Training Course on Certification in Residence Time Distribution and Column Scanning Techniques

Hosted by

The Government of France

through the

COMMISSARIAT L'ENERGIE ATOMIQUE (CEA)

Saclay, France

27 June to 8 July 2022

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Information Sheet

Purpose

The purpose of the event is to train the participants on basic knowledge and practical experiences in radiotracer and gamma scanning techniques applied to process units and columns to obtain the Certification in Radioactive Method – Residence Time Distribution Technique (RTM/RTD) and Sealed Sources Methods – Scan Techniques (SSM/SCT).

Working Language(s)

The working language(s) of the event will be English.

Deadline for Nominations

Nominations received after **6 May 2022** will not be considered.

Project Background

Radiotracers and sealed sources techniques have already become an important tool for diagnosis of process malfunctioning and efficiency optimization. These technologies have been developed and established in some European Member States (MSs). Tracers were used as a service activity in their local industries. The demand for the technology has found to be steadily increasing among the MSs with local capacity and capability. Radiotracer technology plays a cardinal role in assisting engineers in decision making. During the last years, despite conventional methods are available for evaluating process, radioisotope technology has proven to be more economical in such that measurements can be carried out in-situ without disruption of the process or sampling. Information of a process can be obtained in a relatively short period of time so the process engineer is in the position to take action especially when data treatment and interpretation are pushed until Residence Time Distribution (RTD) modelling in order to be integrated with process engineering models. In this case tracer experiments have been able to provide very powerful information. Thus, data treatment, interpretation and modelling have been of a very high importance to strengthen the development of the technology and to increase its use in various industries.

Scope and Nature

The training course will consist of the following:

Theoretical training

Principles and short review of tracer technique for industrial applications and sediment transport studies.

Understanding and review of constraints (such as safety and security) and needs for planning and conducting radiotracers activities

Principles and short review of gamma scanning/nucleonic gauges for industrial applications and environmental studies

Principles on Residence Time Distribution (RTD) modelling

Treatment, interpretation and RTD modelling of the data from experiments in the flow-rig. The flow-rig will be used as a physical model and some configurations will be tested such as mixing tanks in series with different number of tanks, with by-pass, with dead volume, etc....

Practical training

Use of the flow-rig to perform tracer experiment using Tc-99m including injection, use of the data

acquisition system, data treatment and analysis

Setting-up radiation detectors used for radiotracer experiments using basic tools such as Cs-137 calibration source and scope

Principles of gamma scanning/nucleonic gauges for industrial applications and environmental studies

Treatment, interpretation of the data from experiments in column.

Practical training

Use of physical model of column to perform scans, use of data acquisition system, data treatment and analysis

At the end of the training an examination on theoretical part and practical work will be realized and the participants successful to the examination will receive a certificate of competences from the certification body at Level 1 or 2 in Radioactive Tracers Method, Residence Time Distribution Technique (RTM/RTD) and Sealed Sources Method, Column scanning technique (SSM/CST).

Participation

One or two participants from each MSs participating RER1023.

Participants' Qualifications and Experience

The participants should be from nuclear institutions engaged in radiotracers applications and have basic knowledge on radioisotope applications in industry. The participants should have a minimum qualification of university degree in chemical engineering, physics, nuclear engineering or nuclear sciences, mechanical engineering and applied mathematics. It is recommended to the participants to provide evidence that they are covered by a radiological safety system and if possible, a certificate of training on radiological safety. 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.

Occupational Exposure to Radiation

This event may involve occupational exposure to radiation. Therefore, candidates are required to duly complete and return the Occupational Exposure History (OEH) form upon applying for the event. The IAEA will provide selected participants in due course with a dosimeter to monitor their occupational exposure during this event.

Application Procedure

Candidates wishing to apply for this event should follow the steps below:

1. Access the InTouch+ home page (<https://intouchplus.iaea.org>) using the candidate's existing Nucleus username and password. If the candidate is not a registered Nucleus user, she/he must create a Nucleus account (<https://websso.iaea.org/IM/UserRegistrationPage.aspx>) before proceeding with the event application process below.
2. On the InTouch + platform, the candidate must:
 - a. Finalize or update her/his personal details, provide sufficient information to establish the required qualifications regarding education, language skills and work experience ('Profile' tab) and upload relevant supporting documents;
 - b. Search for the relevant technical cooperation event (EVT2202349) under the 'My Eligible Events' tab, answer the mandatory questions and lastly submit the application to the required authority.

NOTE: Completed applications need to be approved by the relevant national authority, i.e. the National Liaison Office, and submitted to the IAEA through the established official channels by the provided designation deadline.

For additional support on how to apply for an event, please refer to the [InTouch+ Help page](#). Any issues or queries related to InTouch+ can be addressed to InTouchPlus.Contact-Point@iaea.org.

Should online application submission not be possible, candidates may download the nomination form for the training course from the [IAEA website](#).

NOTE: A medical certificate signed by a registered medical practitioner dated not more than four months prior to starting date of the event must be submitted by candidates when applying for a) events with a duration exceeding one month, and/or b) all candidates over the age of 65 regardless of the event duration.

Administrative and Financial Arrangements

Nominating authorities will be informed in due course of the names of the candidates who have been selected, and will at that time be informed of the procedure to be followed with regard to administrative and financial matters.

Selected participants will receive an allowance from the IAEA sufficient to cover their costs of lodging, daily subsistence and miscellaneous expenses. They will also receive either a round-trip air ticket based on the most direct and economical route between the airport nearest their residence and the airport nearest the duty station through the IAEA's travel agency American Express, or a travel grant, or they will be reimbursed travel by car/bus/train in accordance with IAEA rules for non-staff travel.

Disclaimer of Liability

The organizers of the event 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 approving his/her participation, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

Note for female participants

Any woman engaged by the IAEA for work or training should notify the IAEA on becoming aware that she is pregnant.

The Board of Governors of the IAEA approved new International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. The Standards deal specifically with the occupational exposure conditions of female workers by requiring, inter alia, that a female worker should, on becoming aware that she is pregnant, notify her employer in order that her working conditions may be modified, if necessary. This notification shall not be considered a reason to exclude her from work; however, her working conditions, with respect to occupational exposure shall be adapted with a view to ensuring that her embryo or foetus be afforded the same broad level of protection as required for members of the public.

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