



# **Training and Certification on Radiotracers and Gamma Scanning**

**Hosted by**

The International Atomic Energy Agency  
IAEA Headquarters

**Seibersdorf, Austria**

**9 to 20 December 2019**

**Ref. No.: TN-RER1020-1900391**

## **Information Sheet**

### **Purpose**

The purpose of the event is to provide basic knowledge and practical experiences on radiotracer and gamma scanning techniques for processing vessels and column online investigation.

### **Working Language(s)**

The working language of the event will be English.

### **Deadline for Nominations**

Nominations received after **4 October 2019** will not be considered.

## **Project Background**

Radiotracers and sealed sources techniques have become an important non-destructive and non-invasive tool for diagnosis of process malfunctioning and efficiency optimization. The technologies have been developed and established in some European Member States (MSs). Tracers are 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 can play a cardinal role in assisting engineers in decision making. Although conventional methods are available, but radioisotope technology is more economically 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 where after process engineer will be 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 will be able to provide very powerful information. Thus, data treatment, interpretation and modelling are 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 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 use of physical model of sedimentation 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).

## 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, persons nominated are required to duly complete and return the Occupational Exposure History (OEH) form. The IAEA will provide 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 IAEA TALEO page (<https://iaea.taleo.net/careersection/ex/jobsearch.ftl>) and complete the Candidate Profile.
2. Be registered on the Nucleus page of the IAEA (<https://nucleus.iaea.org/>).
3. Through Nucleus, access the InTouch+ platform where the Profile is completed (My Profile tab) (<https://nucleus.iaea.org/Pages/InTouchPlus.aspx>).

**NOTE:** The email used for TALEO and Nucleus must be the same. If not, the candidate's profile will not appear complete.

4. On the InTouch + platform, under the 'My InTouch +' tab, the candidate needs to:
  - a. select the institute / organization that he/she works at / represents ('My Institute' section);
  - b. click on the link called '**Refresh Personal History Form**' to update the system, *otherwise the nominations submitted will have these fields empty and it will not be possible to evaluate them during the selection of candidates* ('IAEA Recruitment Platform' section).

**NOTE:** Once the above steps are finalized, the candidate's profile will appear as completed and he/she can apply for Technical Cooperation events.

5. In the InTouch+ platform (<https://intouchplus.iaea.org>), in the 'Applications' tab, search by the event number provided in the invitation.

The help for each step is located at the top of the page. For additional help on how to register, create a profile and apply for an event, please refer to the online guide and training videos available under the following links: [how-to guide](#) and [training videos](#). Any issues or queries related to the new system can be addressed to [InTouchPlus.Contact-Point@iaea.org](mailto:InTouchPlus.Contact-Point@iaea.org) or [TC-AIPS-PL4.Contact-point@iaea.org](mailto:TC-AIPS-PL4.Contact-point@iaea.org).

Should this not be possible, applicants may download the Nomination Form for the TN from the IAEA website <https://www.iaea.org/services/technical-cooperation-programme/how-to-participate>.

Applications should contain sufficient information to establish that the nominees have the required qualifications. Please note that the information regarding LANGUAGE SKILLS, EDUCATION AND WORK EXPERIENCE is exported from TALEO. If an applicant's profile in TALEO is not updated, the information in INTOUCH+ for these sections appears as empty and the candidates cannot be evaluated. Completed applications need to be endorsed by the relevant national authority, i.e. the National Liaison Office and submitted through the established official channels.

## **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.

## **IAEA Contacts**

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