

Job Description for Professional Posts

Position and Grade:	Non-Destructive Assay Technologies Specialist (P-5)
Organizational Unit:	NDA Services Team Non Destructive Assay Section Division of Technical and Scientific Services Department of Safeguards
Duty Station:	Vienna
Type/Duration of Appointment:	Fixed term, 2 years (subject to a probationary period of 1 year)

Organizational Setting

The Department of Safeguards is the organizational hub for the implementation of IAEA safeguards. The IAEA implements nuclear verification activities for more than 170 States in accordance with their safeguards agreements. The safeguards activities are undertaken within a dynamic and technically challenging environment including advanced nuclear fuel cycle facilities and complemented by the political diversity of the countries.

The Department of Safeguards consists of six Divisions: three Operations Divisions: A, B and C, for the implementation of verification activities around the world; and three Technical Divisions, (i) Division of Concepts and Planning, (ii) Division of Information Management, and (iii) Division of Technical and Scientific Services, as well as two Offices: the Office of Safeguards Analytical Services and the Office of Information and Communication Services.

The Division of Technical and Scientific Services is the departmental branch for nuclear and other measurement, containment and surveillance projects and all verification logistics.

The Division is structured into four sections responsible for Non-destructive Assay (NDA) Technologies, Unattended Systems, Systems Integration and Coordination, and Verification Logistics.

The Section for Non Destructive Assay (TND) is responsible for development, testing, commissioning and provision of equipment for non-destructive assay of nuclear materials; development, implementation and maintenance of respective methodologies to be applied by SG inspectors; provision of relevant training and/or expertise through direct participation in field measurements; providing relative methodological support to the section of unattended systems and other users.

The section also coordinates review, identification, evaluation and testing of emerging innovative technologies, having potential for future safeguards applications. Exploiting synergy in the area of radiation detection with the nuclear security applications, the section is also providing Agency-wide technical support to nuclear security projects.

Main Purpose

Publication of the IAEA Department of Safeguards Long-Term Research and Development Plan, 2012-2023 in January 2013 has crystalized the growing need for expertise in the area of NDA systems to develop methods to verify fresh fuel in shipping containers without opening the containers, to address verification of waste and scrap nuclear material with impure composition or heterogeneous isotopic composition, as well as development of more sensitive and less intrusive NDA instruments to perform partial defect test on spent fuel assembly prior to transfer to difficult to access storage. The purpose of the position is to contribute establishing technical and scientific capabilities in areas described above where IAEA experience is limited and available expertise needs to be strengthened. Therefore, the incumbent will essentially contribute in establishing the IAEA Safeguards Capability 5 "Ability to develop equipment at facilities to meet safeguards requirements". In particular, the Non Destructive Assay Technologies Specialist will define the technical and functional requirements, establish benchmarking criteria, administer performance evaluation and provide implementation support for commercial of-the-shelf and experimental prototype solutions for advanced NDA systems including the gamma tomography systems and other NDA techniques such as neutron multiplicity for application to nuclear waste, special nuclear material and spent fuel assessment.

Role

The NDA Technologies Specialist is: (1) *a leading expert* introducing and developing usage of selected advanced NDA techniques not currently in use within the department; (2) *an expert adviser* to the Operations Divisions and SGTS management on the selection and use of safeguards NDA instruments in his/her area of expertise; (3) *an engineering support specialist*, providing effective operational support for improvement of NDA systems at the IAEA HQs and in the field, and (4) *a project manager*, taking lead in implementing state of the art project management techniques towards timely execution of implementation tasks, contracted activities and development tasks under Member State Support Programmes.

Partnerships

The specialist in Non-Destructive Assay Technologies works closely with the staff of the TND Section providing expert support and guidance to other staff in Division. He/she engages with R&D laboratories and Member State Support Programmes to coordinate development needs for specific gamma-emission tomography systems and other NDA systems and provide technical guidance. He/she interacts with external stakeholders to evaluate and apply up-to-date technologies for enhancing Agency verification equipment.

Functions / Key Results Expected

- The specialist in NDA Technologies will contribute to the programmatic goal to provide technical and scientific support to the Department of Safeguards Operations staff. To do so, the following functions will be performed by the incumbent:
- To strengthen the SGTS capability to provide technical support for future SG implementations, act as a lead in the development and implementation of Non Destructive Assay systems and techniques specifically in elaborating proposals and managing related projects as necessary:

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- regarding quantitative verification of gamma-ray emitting radionuclides in small containers taking into account the actual un-homogenous absorption and radionuclide distribution across the object;
- regarding development and implementation of more sensitive and less intrusive alternatives to existing NDA instruments to perform partial defect test on spent fuel prior to transfer to difficult to access storage;
- regarding use of neutron coincidence systems based on advanced detectors including scintillation detectors.
- To provide field support for the deployment of selected NDA systems;
- To improve the operational use of NDA equipment, develop and deliver technical support procedures and training for use in the field by SG Operations staff;
- To address on-going issues involving NDA equipment;
- To facilitate the implementation of the Quality Management System of the Department; document and report on the achievements in compliance with the QMS guidelines.

Knowledge, Skills and Abilities

- Expert level knowledge in tomography techniques for assay of nuclear material;
- Expert level knowledge in gamma spectrometry and neutron coincidence counting techniques for assay of nuclear material;
- Excellent computer skills: radiation transport simulation codes, burn-up depletion codes and MS Office applications;
- Demonstrated ability to write clear and concise technical reports, procedures, and/or technical specifications;
- Demonstrated capability to manage complex engineering/scientific projects, from the conceptual stage, through prototyping, evaluation, and field-testing;
- Demonstrated communication and interpersonal skills, and the ability to establish and maintain effective working relations with Agency staff at all levels;
- Ability to work in a multicultural environment with sensitivity and respect for diversity.

Education, Experience and Language Skills

- Advanced university degree in Physics or Nuclear Engineering supplemented by in-depth theoretical and practical experience in areas relevant to NDA of nuclear material;
- Ten years of relevant experience in experimental nuclear physics and in detection and assay of nuclear and radioactive material;
- Demonstrated experience in use of computerized tools such as MCNP for the numerical simulation of NDA systems;

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- Demonstrated experience in detection and characterization of nuclear and radioactive material and/or operation of nuclear facilities;
- Experience in developing, evaluating, and implementing various types of radiation detection equipment;
- Experience in working with radioactive sources;
- Fluency in English is required;
- Fluency in other UN languages or German is an asset.
- *NOTE: The incumbent of the post will be considered to be a radiation worker and be subject to an appropriate programme of physical and special medical surveillance arranged by the Agency.*

Internal Human Resources use only:	
Effective Date:	
Occupational Group(s):	
Post Number:	