

Position Management Detail Report

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Position Review

Position Number		Position Type	CFE	Subject to Radiation	Yes
Hyperion Position Number		Fund Type		Parent Position	
Organization	SG/IAEA	FTE	1	CCOG 1	
Grade	P3	Duty Station	Vienna	CCOG 2	
Classified Grade		Position Title	Nuclear Instrumentation Systems Engineer	Proposed New Title	

Job Description Review

Organization Settings

The Department of Safeguards (SG) is the organizational hub for the implementation of IAEA safeguards. The IAEA implements nuclear verification activities for some 180 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; three Technical Divisions: Division of Concepts and Planning, Division of Information Management, and Division of Technical and Scientific Services; as well as three Offices: the Office for Verification in Iran, the Office of Safeguards Analytical Services and the Office of Information and Communication Services.

The Division of Technical and Scientific Services (SGTS) is the departmental branch for nuclear and other measurement systems applied in verification activities, containment and surveillance techniques and all verification logistics. Within the Department of Safeguards, the Division of Technical Support is responsible for the development and implementation of the Department's equipment systems.

The Section for Unattended Systems (TUS) is responsible for the full development, assembly, testing, implementation and maintenance cycle of all measurement and surveillance systems to be permanently installed and operating in unattended mode at nuclear facilities worldwide. The Section is comprised of two specialized teams (technical units): Surveillance and Unattended Monitoring Systems (UMS).

Main Purpose

As a team member reporting to the Leader of the UMS Team, the Instrumentation Systems Engineer provides technical support for the development and deployment of unattended non-destructive assay (NDA) systems. He/she participates in the Research and Development projects that have been initiated internally or through Member State Support Programmes, which include: The design and development of new unattended systems and methods using simulation codes, prototype testing, system engineering, and field implementation of new unattended NDA systems; the introduction and testing of new electronic devices used in UMS; the modernization and standardization of existing UMS; the development of software tools related to SGTS equipment, and the contribution to the SLA project.

Role

The Nuclear Instrumentation Systems Engineer is an implementer that provides full technical support to the UMS staff in all hardware and software aspects of the development, testing, calibration, installation and maintenance of UMS, in order to meet the requirements of higher-level Safeguards objectives in nuclear fuel cycle facilities. He/She contributes to an efficient and effective implementation of the development, installation, and maintenance and design verification of UMS.

The Nuclear Instrumentation Systems Engineer also provides technical advice in the design, development, characterization and testing of UMS as a part of SGTS technology development projects.

The Nuclear Instrumentation Systems engineer also provides advice and training to other Divisions in the Department of Safeguards as required and appropriate.

Partnerships

The Nuclear Instrumentation Systems Engineer in the UMSTeam provides guidance to the Team's technicians. He/she collaborates with the other technical professionals in the Team to provide technical support in developing and designing the optimal UMS to address safeguards needs.

He/she participates with technical professionals and inspectors in the Department of Safeguards to the definition of UMS needs and requirements of the Operations Divisions. He/she participates in the coordination and management of technical collaborations with National Laboratories and other entities for the development and implementation of the Programme (SGTS-011) through MSSPs.

Additionally, he/she acts as a technical point of contact for the Operation Divisions of the Department of Safeguards, providing support and training to inspectors for UMS systems and techniques.

Functions / Key results Expected

1. **Design and development of new unattended instruments and methods:** He/she provides advice and support to SG Operations Divisions to determine implementation requirements and ensures that all requirements are met. The CFE contributes actively to the development of current UMS, namely the UCVS (Unattended Cylinder Verification System); the UGET (Unattended Gamma Emission Tomography); and develops and writes the required technical documents, System Reference Manuals, Guidelines, testing and calibration procedures for equipment.
2. **Defining and testing new UMS components:** He/she contributes to the testing of new electronic devices in the lab and prepares for field testing, which includes: the Advanced List Mode Module (ALMM), the Unattended Dual-Current Monitor (UDCM); the Fast Current Preamplifier; the Time Domain Reflectometry (TDR) technology. Through existing US Support Tasks, as detailed in the D&IS Programme, he/she liaises with the Los Alamos National Laboratory (LANL) to coordinate required bug fixes and improvements of electronic devices developed by the LANL SG Group and used by IAEA SG.
3. **Modernization and standardization of existing UMS systems**
Under the guidance of the team leader he/she contributes to the on-going improvement and development of UMS with a focus on standardization, usability, maintainability and cost effectiveness. In particular he/she shall contribute to the design and testing of an improved version of the Unattended Fork Detector Monitor (UFD) system through MCNP modelling.
4. **Software related Tasks:** He/she leads the development of UMS specific data analysis and technical data review tools in compliance with established divisional requirements regarding software development governance.
5. **SLA Project:** He/she assists the Division of Concepts and Planning (SGCP) with software tools for the development and analysis of APAs/SLAs.

Competencies

Core Competencies

Competence	Level	Behavioral Indicator
Communication	Individual Contributor	Communicates orally and in writing in a clear, concise and impartial manner. Takes time to listen to and understand the perspectives of others and proposes solutions.
Achieving Results	Individual Contributor	Takes initiative in defining realistic outputs and clarifying roles, responsibilities and expected results in the context of the Department/Division's programme. Evaluates his/her results realistically, drawing conclusions from lessons learned.
Teamwork	Individual	Actively contributes to achieving team results. Supports team

	Contributor	decisions.
Planning and Organizing	Individual Contributor	Plans and organizes his/her own work in support of achieving the team or Section's priorities. Takes into account potential changes and proposes contingency plans.

Functional Competencies

Competency	Level	Behavioral Indicator
Technical/Scientific Credibility	Specialist	Provides guidance and advice in his/her area of expertise on the application of scientific/professional methods, procedures and approaches.
Client orientation	Specialist	Helps clients to analyse their needs. Seeks to understand service needs from the client's perspective and ensure that the client's standards are met.
Judgement/decision making	Specialist	Consults with the supervisor/manager and takes decisions in full compliance with the Agency's regulations and rules. Makes decisions reflecting best practice and professional theories and standards.

Expertise

Expertise	Description
Engineering; Non-destructive Assay	Ability to design, develop, test and implement NDA system used to verify the presence/absence, amount and unique characteristics of Pu/U/Spent Fuel; Experience w/ transport simulation codes(e.g. MCNP)
Engineering; Project Management	Ability to manage projects, set objectives and plan activities/projects in advance. Ability to identify and organize internal/external resources and monitor performance against very tight deadlines.
Operations and Inspections; Nuclear Fuel Cycle/Nuclear Facilities	Experience on process control and Safeguards instrumentation for Nuclear Fuel Cycle facilities and nuclear reactors.

Position Specific Expertise	Description
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Languages

Languages	Asset Languages
English	Arabic
	Chinese
	French
	Russian
	Spanish

Qualification

Qualification Title	Description
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Master's Degree	Advanced university degree in physics, applied physics, nuclear engineering or electrical engineering
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Experience
<ul style="list-style-type: none"> • At least 5 years of work experience in the development, deployment, production or use of nuclear NDA instrumentation, experience with IAEA instrumentation being an asset. • Experience in setting-up, diagnosing and troubleshooting NDA instrumentation. • Detailed design, development or implementation experience with nuclear detectors and related data acquisition systems, such as gamma-ray spectrometers and neutron coincidence counters. • Experience in data acquisition systems applied to NDA instruments including shift registers, multichannel analyzers, list-mode devices, and digitizers. • Experience with NDA data acquisition and review software. • Demonstrated experience with particle transport simulation software such as MCNP and experience simulating detector response. • Demonstrated software development experience for NDA systems using Microsoft C# and Python programming languages. • Experience with unattended monitoring systems used for safeguards is desirable, specific experience with LANL-based devices (e.g. MiniGRAND, AMSR, JSR, UDCM) is an asset.

Job Description Remarks

Requisition					
Contract Type	Fixed Term - Regular	Expected Start Date	2020-07-01	Duration	24
Fully Competitive Recruitment	No	Travel	Yes, 25 % of the Time		