

COGNMAS13

Compilation of accounts and nuclear material accountancy and safeguards reporting



Overview

This NOS forms part of a suite of standards which cover the activities carried out by individuals working within and on behalf of nuclear site licensed companies to meet nuclear material accountancy, control and safeguard (**NMAS**) requirements.

What is the NOS about?

A nuclear licensed site must ensure that nuclear materials are accounted for, controlled and safeguarded in order to demonstrate; good governance arrangements; meeting international safeguards commitments; and compliance with legal requirements and any voluntary undertakings. This NOS describes the standard expected of individuals who are responsible for producing and reporting nuclear material accounts in the NMAS system.

Who is the NOS for?

This NOS is primarily for the Nuclear Material Accountants and their NMAS Managers within nuclear site license companies who are responsible for managing compliance with NMAS requirements for nuclear material accounting and reporting at a site or an organisational level.

The main outcome of this activity is correctly maintained and compiled system of nuclear material accounts and safeguards reporting.

Where text is highlighted in bold, it is more fully defined in the Glossary section of this NOS.

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Performance criteria

You must be able to:

- P1 develop, approve and implement (the accountancy elements) **NMAS risk assessments; implementation framework; supplementary safeguards arrangements** and **Design Intent Documentation**.
- P2 meet **NMAS requirements**, particular accountancy requirements in supplementary safeguards information, and other **associated regulatory requirements**
- P3 maintain separate and consistent accounts for civil and defence nuclear materials; and for customers where required
- P4 develop and approve systems for allocation of nuclear materials for co-processing arrangements
- P5 maintain **Accountancy Area accounts** and associated **book balances** for nuclear material, reconciled and adjusted to the results of physical inventory takes
- P6 deploy a system of material balance and shipper/receiver difference action levels to detect and report **anomalies**
- P7 produce safeguards reports and records as required by and in the format and timescale specified by **stakeholders**
- P8 deploy audits, reviews, performance monitoring and analysis and report on NMAS system effectiveness
- P9 provide an annual NMAS assurance report to management
- P10 undertake account reconciliation with all available information and NMAS systems
- P11 operate NMAS business continuity processes, including emergency procedures to enable reconstruction or reconstitution of the nuclear material accounts
- P12 test, validate, configure, develop, purchase, design NMAS accounting software and select and use a range of advanced tools and techniques to analyse accounts and to deal with complex or non-routine accountancy requirements
- P13 adhere to the records management system, authorisations, and stakeholder interface requirements
- P14 implement interactions with safety and security systems (e.g. plant modifications, incidents etc)
- P15 identify and communicate where safety and security requirements conflict with/ compromise meeting NMAS requirements

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Knowledge and understanding

You need to know and understand:

- K1 the NMAS requirements and **supplementary safeguards arrangements** in depth
- K2 the **process context**, implementation framework, other associated regulatory requirements, inventory arrangements, and production/shutdown plans for your area of responsibility
- K3 organisational **Knowledge Management** systems
- K4 organisational **record management system requirements**
- K5 the NMAS performance targets and achievement
- K6 the **international non-proliferation regime**, detailed Safeguards implementation (techniques, approaches, inspection, reporting, limits of authority) and stakeholder management arrangements
- K7 **quality control** and quality assurance methods used to confirm the effectiveness of your material accounts
- K8 accounting principles, conventions, theory, tools and techniques, best practices appropriate to your areas
- K9 the system for maintaining accounts and the analysis of anomalies and discrepancies
- K10 available I.T. software systems for handling NMAS accountancy and associated source data and their design and performance characteristics
- K11 the NMAS emergency and incident reporting arrangements
- K12 security, safety, criticality and waste management arrangements and how they are applied to stakeholders in the execution of their independent verification duties

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Additional Information

Glossary

Accountancy Area accounts: a breakdown of the sites nuclear material holdings into a set of accounts, physically localised enough to enable adequate nuclear material control and effective resolution of anomalies. The safeguards inspectorates have defined the site as comprising one or more Material Balance Areas (MBAs) requiring accountancy balances for each material category. Site's may subdivide MBA accounts into smaller accountancy area accounts (e.g. glove box, rooms, etc) and subdivide balances (by material type, enrichment, etc).

Anomalies: the NMAS discrepancies that are consistent with the absence or gain of a significant amount of nuclear material. These include:

- 1 unacceptable losses or gains detected by the account balances or by process monitoring
- 2 loss or gain of a discrete item on site or in transit
- 3 significant finds of nuclear material
- 4 unacceptable shipper/receiver difference

Associated Regulatory requirements: such as Safety, Security, Waste Management, Environmental Protection, Import/Export controls, and Transport

Book balances: totals maintained in a double entry system of nuclear material accounts to show the calculated balance of material thought to be present in each balance area. It is appropriate to have running (continuously updated) balances on nuclear material weights, fissile isotopes and on number of items (in an item area). The book balance should be available in total form and in its constituent running book inventory form for stored items and their location (unless provided for by plant systems).

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Design Intent Documentation: includes

- 1 the project approved NMAS specification of design features and capabilities
- 2 the catalogue of design documents exchanged with the safeguards inspectorates
- 3 the approach agreed with the safeguards inspectorates detailing the independent equipment, installation requirements, data provision/access requirements, inventory requirements, and design verification requirements
- 4 the project commissioning and engineering plans with NMAS requirements integrated
- 5 the NMAS Commissioning specification
- 6 the initial measurement control programme and material balance capability expectations.

Implementation Framework: includes the NMAS physical and the managerial arrangements. It defines; the Material balance areas; transfer boundaries; key measurement points; NMAS capabilities, resources and infrastructure; control arrangements. It defines; organisational structures, responsibilities and accountabilities, separation of duties, those with direct custodial care of nuclear material and the competency framework.

International Non Proliferation Regime: a system of international controls to prevent the spread of nuclear weapons and includes export controls, physical protection and safeguards verification. It supports the nuclear Non Proliferation Treaty (NPT) to which the UK is a signatory.

Knowledge Management: includes capture of all available sources of knowledge, including tacit knowledge of previous operational staff

NMAS: is taken to include nuclear materials accountancy, nuclear materials control and nuclear material safeguards.

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NMAS requirements: comprise mandatory requirements set down in binding legal contracts, set, set down in UK policy and commitments, and set down in national and international Treaties and Regulations (particularly the safeguards reporting regulations and associated implementation guidelines). They also include optional requirements to which the site voluntarily subscribes.

NMAS risk assessment: the analysis of the risk of diversion of nuclear material and involves postulating unauthorised removal scenarios and assessing the controls required to mitigate the risk. It also includes assessing the risk of various material forms and flows and measurement limitations to the overall capability and quality of the NMAS system.

Process Context: includes the plant design, the measurement envelope, the physical and chemical properties of materials in the plant flow-sheet, the ionising radiation environment, measurement system maintenance and eventual decommissioning policy and the plant operating parameters and expected throughputs.

Quality control: includes performance monitoring and testing, quality control and quality assurance, record keeping, and where appropriate, measures to protect from unauthorised tampering or prevent measurement systems being bypassed.

Record management system requirements: the site's overall records management system should be compliant with or equivalent to relevant standards. The emphasis in NMAS record management is:

- 1 authorising, securing, retaining, archiving, and destroying records
- 2 ensuring provenance of data by traceability of accounting records to their source documents (operating records) and authenticity checks
- 3 provision of linkage and activity logs to facilitate tracking nuclear material batch/item histories (of movement, modification, and correction)
- 4 segregation of the handling of records for civil nuclear material from those for defence materials

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Stakeholders include:

- 1 contacts within the site, the organisation, the parent company, the site owner
- 2 customers and contractors
- 3 public groups
- 4 national bodies with responsibilities for NMAS including the Department for Energy and Climate Change (DECC), the Office for Nuclear Regulation (ONR) Safeguards function and the Ministry of Defence.
- 5 regulators including:
 - 5.1 the ONR Safety function, the ONR Security function, and the ONR Transport function (Radioactive Materials)
 - 5.2 environmental (EA, SEPA)
 - 5.3 the International Safeguard Inspectorates (the European Commission's Euratom Safeguards Inspectorate and the International Atomic Energy Agency Safeguards Inspectorate)

Supplementary safeguards arrangements: this includes:

- **BTC** - Basic Technical Characteristics required by the Euratom regulation to describe the site fuel cycle processes and NMAS related systems
- **DI** - Design Information is the IAEA counterpart of the BTC and serves the same purpose
- **PSP** - Particular Safeguards Provisions are additional (to the regulation) safeguards requirements specific to your site set out by Euratom
- **FA** - Facility Attachments is the IAEA counterpart of the PSP.
- **AP submissions** - Details as required by the safeguards Additional Protocol.

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