



Namibian
Uranium
Association

*Health, Environ-
ment, Radiation
Safety and Securi-
ty (HERSS)*
Standards

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Namibian Uranium Association



HEALTH, ENVIRONMENT AND RADIATION SAFETY AND SECURITY (HERSS) STANDARDS

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Good Practice

Health, Environment, Radiation Safety and Security (HERSS) Standards

INTRODUCTION

The Namibian Uranium Association (NUA) wishes to acknowledge the following companies for initiating and sustaining the Uranium Stewardship programme in response to the “uranium rush” in Namibia:

- Rössing Uranium Limited
- Langer Heinrich Uranium (Pty) Ltd
- Areva Resources Namibia (Pty) Ltd
- Swakop Uranium (Pty) Ltd
- Bannerman Mining Resources (Namibia) (Pty) Ltd
- Valencia Uranium (Pty) Ltd
- Reptile Uranium Namibia (Pty) Ltd
- Zhonghe Resources (Namibia) Development (Pty) Ltd
- Marenica Energy Limited
- Rio Tinto Exploration (RTX)

The NUA and the members of its Sustainable Development Committee invested both time and effort in the development and review of this document, which like all dynamic products will continue to be improved. I wish to acknowledge in particular the dedicated work of Sandra Müller, Rainer Schneeweiss, Herman Strauss, Angie Kanandjembo, Riana Scholtz, Michelle Pfaffenthaler, Gunhild von Oertzen and Detlof von Oertzen. The HERSS Standards are aligned with Namibian laws/Regulations and Leading practices in the field of Health, Environment and Radiation Safety and Security.

Sincerely,

Wotan Swiegers

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Namibian Uranium Association

Good Practise

Health, Environment, Radiation Safety and Security (HERSS) Standards

FOREWORD

This Standard of Good Practice for Health, Environment and Radiation Safety and Security (HERSS Standards), is published by the Namibian Uranium Association (NUA). It provides a practical basis for uranium exploration or mining companies in Namibia to address Health, Environment and Radiation Safety and Security issues from a business perspective. It forms part of the Uranium Stewardship's Risk Management suite of standards and guidelines and is based on extensive knowledge and practical experience of its members worldwide.

A safe workplace is essential to the continued success of the uranium industry in Namibia. We are committed to protecting our people from harm by eliminating hazards in the workplace and believe that injuries and occupational disease are preventable. The uranium industry has at its heart a simple but enduring principle – those who create risk are best placed to control that risk, whether they are employers, contractors or managers. Our goal is to have no incidents or injuries at all.

Namibia's uranium industry already has one of the best combined health and safety records in the world – a largely unheralded success story of the last 40 years. The Sustainable Development Committee is therefore delighted to present these revised *Health, Environment, Radiation Safety and Security Standards* (hereafter referred to in this document as HERSS Standards). The HERSS Standards apply to the uranium industry in Namibia and are to be an evolving document changing over time. It will therefore be subject to regular review and updated as required.

The HERSS Standards provide:

1. A framework for management of Health, Environment, Radiation Safety and Security in the Namibian uranium industry.
2. A reference point against which continuous quality improvement in healthcare, environmental management, radiation safety and security can take place.

The development and continual updating of the HERSS Standards is an important step forward and brings about substantial convergence between Namibian and international standards. The benefits of these uniform standards are clear and incorporate principles familiar to major uranium mining and milling companies worldwide which will make them easier to implement.

While the Namibian Uranium Association has taken all reasonable care in the preparation of the HERSS Standards, neither the Namibian Uranium Association, its employees, or representatives shall have any responsibility or liability whatsoever with respect to any act or omission (whether negligent or not) of whatsoever nature of, or in connection with, the preparation of the HERSS Standards or any part thereof. These responsibilities are those of the user.



Sincerely,

Deon Garbers

Chair: Namibian Uranium Association

NUSA

Health, Environment, Radiation Safety and Security (HERSS) Standards

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1 NAMIBIAN URANIUM ASSOCIATION (NUA) SUSTAINABLE DEVELOPMENT PRINCIPLES FOR THE NAMIBIAN URANIUM EXPLORATION AND MINING INDUSTRY

1.1 Introduction

Sustainable development is defined as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’, (“Our Common Future” – the Brundtland Report) which is enshrined in the Namibian Constitution.

The Namibian Uranium Association (NUA) represents most uranium exploration and mining companies operational in Namibia. The *Constitution of the NUA* defines the goals and objectives, membership, governance, meetings, decision-making and reporting processes for the NUA. The primary function of the NUA is to protect the interest of member organisations, to uphold uranium mining practice in Namibia to the highest standards, to observe international conventions and to ensure positive development of Namibia’s reputation as a uranium mining nation.

The NUA is a member of the *World Nuclear Association* (WNA) a leadership group focused on improving the sustainable development performance of mining companies. The mining industry, through the WNA, is developing guidelines on materials stewardship to promote responsible management of mining products.

1.3 Uranium Stewardship Approach

The NUA has adopted the stewardship principles published by the *World Nuclear Association*. The NUA promotes sustainable development and the balance between social equity, environmental protection, economic development and an effective governance framework. Sustainable development requires a management framework including a mix of regulatory mechanisms and voluntary initiatives.

The NUA is acting to ensure that all parties directly involved in uranium mining and processing – including operators, contractors and regulators – strive to achieve excellence in these fields of management. The NUA is doing so by sustaining a strong safety culture based on a commitment to a framework of common, internationally shared principles.

As a member of the WNA, the NUA’s members engaged in uranium mining and processing recognize that managing radiation, health and safety, waste and environmental impacts is of paramount importance for the protection of workers, the public and the environment. Such responsible management

(stewardship) of uranium mining and processing projects applies at all stages of planning and activities from exploration through development, construction and operations, and on to decommissioning.

These principles advocate collective responsibility and commitment by all players to the safe and responsible management of the uranium product and clearly outlined in the *WNA's Policy Document: Sustaining Global Best Practices in Uranium Mining and Processing: Principles for Managing Radiation, Health and Safety, Waste and the Environment*.

1.4 International Standards

The NUA firmly believes that all uranium operations in Namibia should implement an internationally accepted environmental management systems such as the ISO system. **ISO 14001** is an internationally accepted good practice guideline that sets out how to put in place an effective environmental management system (EMS). *Rio Tinto Rössing Uranium* and *Langer Heinrich Uranium*, full members of the NUA, are already ISO 14001 compliant.

The NUA also recognizes the fact that it takes time and commitment to introduce such a system. It therefore recommends a stepwise approach as outlined below. As a general guideline the NUA recommends that uranium companies consider adopting the NUA's *HERSS Standards* and the environment, health and social guidelines promoted by the *International Finance Corporation (IFC)* or the World Bank. In cases where mining companies are looking to use bankable feasibility documents, or require finance from the IFC or the World Bank, there is a need for strong adherence to their environmental management requirements. The IFC's Environment and Social Standards apply to all projects it finances to minimize their impact on the environment and on affected communities.

2 HEALTH, ENVIRONMENT, RADIATION SAFETY AND SECURITY STANDARDS FOR THE NAMIBIAN URANIUM EXPLORATION AND MINING INDUSTRY

2.1 Introduction to the Standards

The NUA has a Code of Conduct that defines principles of behaviour and standards of practice for its members, with the aim of guiding improvements in performance in the Namibian mining industry. The NUA openly stated that it has a collective responsibility for leading practice in the stewardship of its product. Leading practice (the best way of doing things at a given site) and a sustainable approach to management is critical for any mining company to gain and maintain its 'social licence to operate' in the community. The NUA realizes that it is ever so important to create synergy between the voluntary initiatives led by the private sector and the state's regulatory tools.

Taking this commitment forward, the NUA has decided to develop standards and guidelines for safety, occupational health and environmental management for uranium mines. The standards are known as **Health, Environment, Radiation Safety and Security Standards** (hereafter referred to in this document as **HERSS Standards**).

These standards are based on practices applied by major international mining companies, partly adapted to Namibian conditions and legal requirements. The standards set out the minimum requirements that are compulsory for members of the NUA. Detailed guidance documents can be found under "**HERSS Guidelines and Toolkit**" on the NUA's website. New companies in the Namibian uranium industry are encouraged to use the guidelines when compiling their health, safety, environment and radiation safety management plans.

The standards and guidelines will not only guide the members of the NUA, but will set goals for uranium exploration companies that are not yet members to follow suit. The NUA will introduce a system of peer reviews to assist exploration and mining companies with the implementation and monitor all members' compliance with the standards.

3 OCCUPATIONAL HEALTH STANDARD FOR THE NAMIBIAN URANIUM EXPLORATION AND MINING INDUSTRY

3.1 Introduction

The development of minimum health and safety standards is based on the Health and Safety Regulations of the Labour Act (Act 11 of 2007) and the Atomic Energy and Radiation Protection Act (Act 5 of 2005). The implementation of minimum standards for occupational health was agreed with the independent medical service providers, an international occupational health consultant and the Ministry of Health and Social Services (MoHSS).

The occupational health issues associated with uranium mining and milling are well documented. This includes exposures to noise, gases, fumes, dust and radiation. While uranium itself is a heavy metal with potentially toxic effects, it is also radioactive and radon, a radioactive inert gas, is released to the atmosphere in very small quantities when the uranium ore is mined and crushed.

Precautions taken during the mining and milling of uranium ores to protect the health of the workers must include:

- The use of detection equipment to detect and quantify noise, fumes, gases, dust and radiation in all mines and plants; and
- Control of noise and vibration sources; and
- Efficient ventilation and dust control, because the dust may contain silica and radioactive constituents which emits radon gas;
- Limiting the radiation exposure of workers in mining, milling and tailings areas so that it is as low as reasonably achievable and in any event does not exceed the allowable dose limits set by the authorities;
- The provision of personal protective gear;
- The enforcement of strict personal hygiene standards for workers handling uranium oxide concentrate.

3.2 Minimum Legal Requirements

All uranium mining and milling operations are undertaken under the Health and Safety Regulations of the Labour Act, the Atomic Energy and Radiation Protection Act and the Workers Compensation Act (WCA) of Namibia. These set strict health standards for exposure, for both workers and members of the public.

3.3 A Member of the NUA shall:

3.3.1 Appoint a duly qualified Occupational Medical Practitioner, who is

- in good standing with the Health Professional Council of Namibia;
- registered as an Occupational Medical Practitioner by the Ministry of Health and Social Services: Directorate Occupational Health (a list of registered occupational health practitioners is available from the Director's office);
- willing and able to accept and implement the **HERSS Standards** and **Guidelines** as published by the Namibian Uranium Association (NUA);
- willing and able to support and take part in NUA Research projects.

3.3.2 Develop and implement an Occupational Health Programme with the following components:

- The surveillance, by means of visits to the workplace, of the factors in the working environment that may affect employees' health, including physical, chemical and biological hazards, psychological factors, the lay-out and safety of existing and to be purchased machinery, other equipment and workstations, work methods, organization of the work and personal protective devices;
 - o This needs to be done in regular consultation with an Occupational Hygiene Authorised Inspection Authority (AIA)
- The provision to employees of the necessary information and training relating to health hazards arising from work and the working environment, as well as advising the employer and employees how to avoid such hazards;
- The examination of the health of the employees prior to the commencement of their employment in order to ensure that they are healthy and fit for the work to be performed (pre-employment medical examination); in accordance with
 - o the Employer's Fitness for Work Policy,
 - o Minimum Medical Requirements for Fitness and
 - o Person Job Specifications
- The examination of the health of employees, periodically after the commencement of employment, if the employees are exposed to occupational health hazards; in conjunction with
 - o a planned biological monitoring program, in order to monitor for possible exposure to hazards (e.g. Uranium in Urine) and
 - o biological monitoring to detect physical effects of exposure as applicable

- The examination of the health of employees upon exit from employment to detect the potential presence of occupational diseases or injuries;
- The surveillance of the occupational hygiene and the hygiene of sanitary installations, and all other facilities relating to the welfare of the employees of the company;
- The record-keeping on employees' health, compilation and periodic review of statistics concerning health conditions in the company;
- Reporting to appropriate authorities:
 - o Diagnosis of Occupational Diseases: To the Chief Medical Officer; Directorate Occupational Health MOHSS
 - o Work related Injuries: Chief Mining Inspector & Workmen's Compensation Commissioner SSC
 - o Overexposure to radiation: Director General of the NRPA
- An electronic database for recordkeeping, reporting and research purposes
- The organisation and provision of first-aid and emergency arrangements; and
- The supervision of applicable working conditions for disabled or impaired employees, including the direction of affected employees to medical career rehabilitation, if necessary;
- The medical surveillance shall be conducted at the expense of the employer, and shall be conducted during working hours, without loss of pay to the employee being examined;
- The employer shall provide suitable facilities at the workplace or at a convenient central locality elsewhere for the medical surveillance, and shall facilitate the performance of the examinations;
- The provider shall ensure that the required occupational health services are rendered at an approved facility which is:
 - o registered with the relevant Municipality as an Occupational Health Clinic and
 - o licensed as an Occupational Health Clinic in terms of Sec 31 of the Hospitals and Health Facilities Act, 1994 (Act 36 of 1994);
- The staff carrying out occupational testing should be
 - o registered with the appropriate authorities and
 - o duly qualified to operate the testing equipment (e.g. Radiation monitoring, audiometry and spirometry);
- Proof of recommended calibration and maintenance records must at all times be available for all testing equipment;
- Detailed information on agreed health surveillance standards and programmes are available from the offices of the NUA.

4 ENVIRONMENTAL STANDARD FOR THE NAMIBIAN URANIUM EXPLORATION AND MINING INDUSTRY

4.1 Introduction

This standard aims to ensure that NUA member businesses comply with all applicable Namibian environmental legislation, international conventions and other requirements, e.g. the Strategic Environmental Management Plan for the uranium rush; and that they manage their environmental aspects in a manner that is planned, controlled, monitored, recorded and audited, using an Environmental Management System that drives continual performance improvement.

4.2 Scope

This standard is applicable to all NUA members. It covers all exploration, construction, mining, processing, distribution, transport, closure and corporate activities. The reference document for mine closure is the Namibian Mine Closure Framework. At established mines the standard also applies to contractors and suppliers with the level of Environmental Management System (EMS) implementation commensurate to the level of environmental aspects and potential impacts associated with the products and services provided by the contractor or supplier.

4.3 Management Principles

4.3.1 Environmental Assessments

All operations must comply with the procedures for environmental assessments detailed in the Environmental Management Act, Act No. 7 of 2007. Specifically, they must ensure that:

- (a) The assessment covers all relevant environmental and social aspects as well as cumulative impacts (refer to list below);
- (b) The public consultation process begins in the early stages of the assessment, allows sufficient time for review and takes into account stakeholders' comments;
- (c) The Scoping Report and Environmental Impact Assessment Report are published in a format that is easily accessible to interested parties and in line with the Environmental Impact Assessment (EIA) Regulations;
- (d) The approved Environmental Management Plan (EMP) is implemented;
- (e) Exploration or mine development activities do not begin before the relevant authorities have issued environmental clearances;
- (f) Adhere to all conditions in the Environmental Clearance.

Consider as a minimum the following list in the process of identifying environmental aspects and impacts associated with the operation:

- (a) Emissions to air
- (b) Visual and other socio-economic impacts
- (c) Noise and vibration
- (d) Greenhouse gas emissions
- (e) Releases to underground and surface waters
- (f) Mineral and non-mineral waste generation, disposal and management
- (g) Impacts of radiation on the public and the environment (refer to the Radiation Safety Standard)
- (h) Use of hazardous materials
- (i) Use of natural resources
- (j) Changes to ecosystems
- (k) Archaeological impacts
- (l) Land use and soil management

Where any of the environmental aspects in the list is not applicable to the operation, include a justification in the assessment report.

4.3.2 Environmental Management System

Exploration companies are required to have an EMP as a minimum. NUA member companies that are in operation are expected to implement an EMS that conforms to a nationally or internationally recognised standard such as ISO 14001 or *European Eco-Management and Audit Scheme (EMAS)*. The environmental policy has to be aligned and compatible with the NUA Charter, and all voluntary environment-related policy principles contained in codes and charters adopted by the NUA. Members are to ensure that the EMS is compatible with the overall management system of the operation and in particular with the occupational health and safety management systems.

4.3.3 Planning

In conformity with the adopted international EMS standard and based on the operation's environmental impact assessment ensure that the following steps are completed:

- (a) Environmental aspects identified and significance of impacts assessed;
- (b) Applicable legal and other requirements identified;
- (c) Legal register compiled;

- (c) Environmental objectives and targets established;
- (d) Environmental management programmes in place.

Ensure that new activities, organizational arrangements and management procedures or changes to existing ones are subjected to previous identification of their environmental aspects and impact assessment through a documented procedure, e.g. a change management procedure.

Translate into the appropriate operational plans, programmes, projects and procedures the operation's environmental performance indicators, objectives and targets. Identify all relevant internal and external business and operational environmental data requirements and establish the data quality provisions necessary to ensure:

- (a) Completeness
- (b) Consistency
- (c) Statistical representation
- (d) Methods used are ethical
- (e) Accuracy and precision
- (f) Transparency

4.3.4 Implementation and Operation

Each company has to have its own minimum operational environmental standards in place. In conformity with the adopted international EMS standard:

- (a) Define environmental management structure and responsibilities;
- (b) Ensure that personnel are trained, aware and competent for managing the environmental aspects and impacts related to their roles;
- (c) Establish internal and external communication procedures;
- (d) Maintain the EMS elements documented (refer to the environmental guidelines on the NUA website for leading practice examples);
- (e) Establish and maintain document control procedures;
- (f) Implement operational control of environmental aspects;
- (g) Maintain an environmental emergency preparedness and response procedure and capability.

Designate operational control of the relevant environmental aspects as a clear and accountable responsibility of line management. This must include the authority, resources and competence required

for operating to established plans and procedures and for achieving the specified environmental performance outcomes and targets.

Establish a cross-functional committee, including the line managers, to support the development, implementation and operation of the EMS including the establishment of targets and objectives on environmental matters. It is essential that the General Manager (or equivalent) and other top management structures, e.g. corporate head offices are fully aware of the EMS, and provide adequate resources to manage the environmental aspects connected with the operation.

Establish a communication programme related to environmental aspects including record keeping of stakeholder complaints, enquiries and views, as well as responses and feedback to them. Ensure that no material change in process or management that might involve an environmental aspect is carried out prior to competent process of approval, communication and incorporation into appropriate routines or procedures.

4.3.5 Conformance and Corrective Action

In conformity with the adopted national or international EMS standard, comply with the following requirements of that standard:

- (a) Maintain procedures to monitor and measure activities that can lead to impact on the environment;
- (b) Maintain procedures for handling non-conformances and for corrective and preventive actions;
- (c) Maintain procedures for environmental record-keeping; and
- (d) Maintain procedures of management system and performance auditing.

Review environmental data on a regular basis and take corrective actions if quality requirements are not met. Establish a process of internal environmental audits covering environmental performance and the environmental management system. The audit requirements and process must ensure that the following conditions for internal environmental auditing are met:

- (a) The members of an audit team must be sufficiently removed from the activities they audit to ensure independence of the audit process and its findings;
- (b) Develop and maintain audit protocols that reflect the environmental aspects and significant impacts of each activity/operation/business to be audited;
- (c) The frequency and coverage of the auditing process must be compatible with the significance of the potential environmental impacts;

- (d) A documented report must be prepared for each environmental audit, which details the audit findings, as well as responsible persons and time frames for closing out the audit findings.

Establish a system for recording and reporting all incidents and non-conformances involving injury to the public, third parties or animals, damage to property or damage to the environment or the potential for such injury or damage. This system must satisfy applicable regulatory requirements. If required by the company, establish a system for ensuring that a written report of significant incidents is submitted to the chief executive within 24 hours of their occurrence. Investigate any significant environmental incidents and non-conformances using qualified and trained personnel and transparent procedures. Incident and investigation reports are communicated in accordance with internal company procedures.

4.3.6 Management Review

Management reviews are carried out regularly to assess environmental performance and review objectives and targets to maintain continual improvement. Conduct a review of the EMS by senior management at least every three years or at lesser intervals if needed. The review process and its outcomes must be documented and signed off by management.

5 RADIATION SAFETY STANDARD FOR THE NAMIBIAN URANIUM EXPLORATION AND MINING INDUSTRY

5.1 Management Principles

All operations working with radioactive materials (defined as per Namibian Radiation Protection and Waste Disposal Regulations 1) must prepare a Radiation Management Plan (RMP). The RMP must comply with the requirements as detailed in guidance document for RMP, as issued by the National Radiation Protection Authority (NRPA) 2.

The RMP must describe a programme of activities that meet all applicable regulatory requirements, and at a minimum include the following elements (as applicable):

1. Introduction and background information on operation;
2. Summary of pre-operational radiation safety risk assessments undertaken;
3. Organisational arrangements relevant to radiation protection;
4. Occupational radiation exposure protection programme, including exposure group and work area classification, exposure controls, occupational exposure monitoring programme and fitness for work requirements;
5. Public exposure monitoring programme, including a programme to monitor the release of radionuclides into groundwater and the air;
6. Waste management plan for disposal of radioactive waste;
7. Transport plan for transporting of radioactive materials in compliance with IAEA Regulations for the safe transport of radioactive materials 3;
8. Safety and security of industrial sources emitting ionising radiation;
9. Control and monitoring of radioactive effluents and emissions to the environment;
10. Clearance and control procedures for all contaminated materials and equipment leaving site; and
11. Emergency procedures for emergencies involving radiation sources.

5.2 Implementation and Operation

Operations that are required by law to submit an RMP must

1. Have a suitably trained radiation officer or have ready access to a trained radiation protection consultant;

2. Have a register of relevant types and quantities of radiation sources that they manage, where the sources have a potential harmful effect;
3. Ensure that all sources in their possession are managed in accordance with the Regulations, including licensing and permit arrangements where required by law;
4. Define, survey and signpost or communicate areas requiring restricted access where the risk assessment indicates a need;
5. Ensure that radiation exposures to workers and the public are eliminated or remain as low as reasonably achievable (ALARA) at all times with social and economic factors taken into account, and remain justified and below legal limits;
6. Have a documented radiation awareness programme for its workers consistent with the requirements under the Radiation Protection Regulations 3;
7. Have a medical surveillance program for workers meeting the requirements of applicable legislation;
8. Have periodic radiation monitoring of sufficient frequency and accuracy to enable occupational dose assessments for workers that are representative; and
9. Have a mine closure plan that ensures compliance with the legal public dose limits, as a minimum.

5.3 *References*

1. Radiation Protection and Waste Disposal Regulations: Atomic Energy And Radiation Protection Act, 2005 (Act No. 5 of 2005), Government Notice No. 220 of 2011
2. Guide to the Development of a Radiation Management Plan (RMP) in support of Applications for Authorisations required under the Atomic Energy and Radiation Protection Act, Ministry of Health and Social Services, document no. NRPA_G_01
3. Regulations for the Safe Transport of Radioactive Material, IAEA Safety Guide SSR-6, International Atomic Energy Agency, 2012

6 SAFETY STANDARD FOR THE NAMIBIAN URANIUM EXPLORATION AND MINING INDUSTRY

6.1 Intent

It is not within the scope of this part to provide a full set of safety standards. However, since there are many exploration and mining companies operating in Namibia, a section on general safety systems in the mining environment was included to provide guidance for such companies.

6.2 General Safety Systems

Each NUA member company's safety management system must as a minimum comply with the Namibian law and this standard. The Safety Standards of the founding company Rössing, who has been operating in Namibia for decades, could be a living example of a well-developed Safety Standard. . Examples of leading safety practices are provided in the HERSS Guidelines on the NUA website.

In order to comply with this standard, a company must have a general safety management system based on risk assessment. The system has to be documented in a clear and auditable form. It has to be practical, working effectively, and include procedures for periodic review and revision. The following minimum requirements for safe work systems have to be covered:

- There must be a system, based on risk assessment, for ensuring that effective controls and safe work procedures exist for all hazardous activities, including the safe handling and storage of hazardous substances, as well as emergency procedures and drills.
- There must be a system for ensuring that employees are trained and equipped to carry out their work according to the applicable safe work procedures, and that their competence has been tested and certified (where applicable)
- There must be a system for ensuring that activities requiring technical certification are carried out only by suitably certified people.
- There must be a system to ensure that the risks associated with aviation operations are controlled in accordance with the NUA Business Unit Aviation Safety Guidelines.
- There must be a system of first-party auditing carried out by line management, which verifies that all employees are competent, trained, equipped and, if required certified, to carry out their work in compliance with safe work procedures; and do in fact carry out their work in accordance with the applicable safe work procedures.

6.3 Promoting safe practices

- Safety professionals implement policies, systems and procedures to continuously improve their performance. Behavioural observations and regular safety or "toolbox" meetings actively promote safe practices.
- Site based safety committees and a safety executive committee work to improve safety performance by:
 - Raising safety awareness
 - Enhancing safety skills through training
 - Implementing systems that assess the risk of operational hazards
- Major initiatives that continue to improve our safety performance include:
 - Man-machine interface programme
 - Hazardous energy control programme
 - Safety leadership programme
 - Major risk management assessments

7 SECURITY STANDARD FOR THE NAMIBIAN URANIUM EXPLORATION AND MINING INDUSTRY

7.1 Intent

This chapter of the HERSS Standards describes the Security Standard applied at Namibian uranium mines.

7.2 Purpose

The Security Standard aims to ensure that uranium concentrate produced at Namibian uranium mines is effectively and efficiently secured throughout the entire production chain, including during processing, handling, storage and transport. The safety and security of uranium ore and related materials is not addressed in the Safety Standard, and forms part of every mine's Radiation Management Plan, as required by the National Radiation Protection Authority.

7.3 Guiding Philosophy

Security is achieved by way of a multi-layered system of site- and situation-specific measures and processes. These security provisions ensure that access to uranium concentrate and the control thereof is and remains strictly limited to individuals and entities that fulfil the necessary security and regulatory requirements and are compliant with all relevant national and international laws.

7.4 Confidentiality

Specific security systems, processes and arrangements are most effective if their detailed design and implementation remains strictly classified. This chapter recognises the confidential nature of effective security systems and therefore focuses on the principles that govern the security systems put in place by each producer of uranium concentrate in Namibia.

7.5 Compliance

Every NUA member producing uranium concentrate must as a minimum comply with the Namibian law and this Standard.

7.6 The Security Standard

The Security Standard defines the principles for the establishment, implementation and maintenance of an integrated multi-layered system of security and protection measures aimed to ensure that the on-site as well as off-site risk of misappropriation of uranium concentrate is minimised at all times.

The Security Standard is based on the establishment, implementation, ongoing maintenance and continuous refinement of a security system that contains the following main elements:

7.6.1 Design

The design of the security system

- (a) is based on an appropriate site- and situation-specific combination of integrated physical, electronic, human and procedural measures;
- (b) is a multi-layered system of security and protection of uranium concentrate;
- (c) is regularly monitored and tested to identify weaknesses and respond to changes;
- (d) includes provisions for regular documentation, reporting, audits, assessments and ongoing refinement;
- (e) includes provisions for its own protection;
- (f) ensures that activities requiring technical certification and/or specialist training are only undertaken by suitably certified staff or external entities;
- (g) is managed and implemented by trained and regularly assessed security personnel.

7.6.2 Physical protection

The security system uses physical protection measures to ensure that the misappropriation of uranium concentrate is kept to an absolute minimum, both at fixed sites and installations and while in transit. The security system uses physical protection measures that

- (a) do not constitute an unreasonable health and safety risk to members of the public or directly or indirectly affected employees;
- (b) are based on explicit entry and exit authorisation control measures that are planned and documented, and allow for ongoing monitoring, regular reporting and continuous refinement;
- (c) use written security and removal procedures for persons, vehicles and materials;
- (d) directly and indirectly employ measures to prevent the access of unauthorised persons to areas in which uranium concentrate is handled, stored or transported;
- (e) are based on the integrated use of a combination of perimeter and access control measures, including both active and passive theft prevention controls;
- (f) provide diverse, integrated and partially redundant measures which require the deliberate penetration of separate protective elements to enable access to uranium concentrate;
- (g) mandate staff to document both on- and off-site security-related activities that are related to the storage, handling and transport of uranium concentrate;
- (h) are strengthened by regular and independent assessments, audits and reviews;
- (i) ensure that the lessons learnt in securing uranium concentrate are optimally shared with relevant security personnel and management;
- (j) are managed by trained and regularly tested security personnel.

7.6.3 Monitoring, surveillance and detection

The security system uses monitoring, surveillance and detection measures that

- (a) are integrated and form a multi-layered set of active and passive security defences;
- (b) define contiguous detection zones around the areas in which uranium concentrate is handled, stored and transported, with the aim of isolating and controlling the entry and exiting of authorised personnel and materials to each such zone;
- (c) enable security personnel to detect the presence of unauthorised persons, vehicles,

- materials, or unauthorised activities in areas where uranium concentrate is handled, stored or transported;
- (d) can be used to observe individuals in different access areas to ensure that concentrate is not moved to unauthorised locations or handled using unauthorised procedures;
 - (e) track, record and document the movement of individuals based on an individualised access control system to areas with uranium concentrate;
 - (f) are regularly assessed and tested, independently audited, and continuously refined to improve their usefulness and effectiveness;
 - (g) are managed by trained and regularly tested security personnel.

7.6.4 Reaction and response

The security system uses reaction and response measures that

- (a) do not constitute an unreasonable health and safety risk to members of the public or directly or indirectly affected employees;
- (b) minimise the response time between the detection of an event constituting a security incident and/or security breach, and the resolution thereof;
- (c) use technologies that enable rapid communication between those tasked to address and resolve security incidents/breaches and management;
- (d) document all events classified as potential or actual security incidents and breaches;
- (e) include mechanisms to regularly test and assess, independently audit and continuously refine such measures;
- (f) have provisions that ensure that lessons learnt from reaction and response measures are captured and effectively shared with those tasked to secure uranium concentrate;
- (g) are managed by trained and regularly tested security personnel.

7.7 Security Management System

In order to comply with the Security Standard, a uranium mine must use a security management system, which dynamically and effectively responds to and mitigates particular site- and occasion-specific security risks that have or may potentially arise during the production, storage, handling and transport of uranium concentrate.

The Security Standard is implemented by way of a security management system, which has to be documented in a form allowing its effective implementation and maintenance, and makes provision for regular assessments and testing, as well as independent audits and reviews.

The security management system includes measures designed to verify that security staff are adequately trained, equipped and hold a site-specific certification(if required), to undertake their work in compliance with the Security Standard as well as specific in-house security protocols and procedures.

7.8 Security Management

Management of the security of uranium concentrate is the responsibility of the uranium mine's Security Manager. The Security Manager is overall in charge of all matters relating to the on- and off-site management of the security of uranium concentrate. The Security Manager also ensures that all permits for the handling, storage and transport of uranium concentrate, as per the relevant Namibian

legal and statutory requirements, are up to date and available.

7.9 Security Staff

Individuals wishing to work as security personnel at a Namibian uranium mine may have to undergo a pre-employment screening assessment, as required by site-specific considerations. In addition, security personnel may be requested to produce a police clearance certificate before the commencement of their duties, or during their tenure as security staff. Security staff employed by Namibian uranium mines undergoes site-specific training, and if required, site-specific certification, before being entrusted with the security of uranium concentrate and associated operations.

Upon successful completion of a mine-specific security training course, security staff are issued with a site-specific identification and/or access control card, which is approved by the mine's Security Manager. If site-specific considerations require this, on-duty security staff openly displays the identification card, which also permits such staff to conduct physical searches as well as all other tasks related to the security of uranium concentrate.

In extraordinary circumstances, e.g. when undertaking an undercover operation on the explicit instruction of the Security Manager and subject to site-specific considerations, security staff may be exempted from displaying their identification card while on duty.