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**INTEGRATED  
REGULATORY  
REVIEW SERVICE  
(IRRS)**

TO  
**NAMIBIA**

**National Radiation Protection Service  
Ministry of Health and Social Services**

Windhoek, Namibia

*07 to 11 April 2008*

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY



European Union

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## FOREWORD

Under the terms of Article III of its statute, the International Atomic Energy Agency (IAEA) has the mandate to establish or adopt, in consultation and, where appropriate, in collaboration with competent organizations, standards of safety for protection of health and minimization of danger to life and property (including such standards for labour conditions), and to provide for the application of these standards to its own operations as well as to assisted operations and, at the request of the parties, to operations under bilateral or multilateral arrangements or, at the request of a State, to any of that State's activities concerning peaceful nuclear and radiation activities. This includes the publication of a set of Safety Standards, whose effective implementation is essential for ensuring a high level of safety. As part of its providing for the application of safety standards, the IAEA provides Safety Review and Appraisal Services, at the request of Member States, which are directly based on its Safety Standards.

In the regulatory framework and activities of the regulatory bodies, the IAEA has been offering, for many years, several peer review and appraisal services. These include: (a) the International Regulatory Review Team (IRRT) programme that provides advice and assistance to Member States to strengthen and enhance the effectiveness of their legal and governmental infrastructure for nuclear safety; (b) the Radiation Safety and Security Infrastructure Appraisal (RaSSIA) that assesses the effectiveness of the national regulatory infrastructure for radiation safety including the safety and security of radioactive sources; (c) the Transport Safety Appraisal Service (TransSAS) that appraises the implementation of the IAEA Transport Regulations; and (d) the Emergency Preparedness Review (EPREV) that is conducted to review both preparedness in the case of nuclear accidents and radiological emergencies and the appropriate legislation.

The IAEA recognized that these services and appraisals had many areas in common, particularly concerning the requirements on a State to establish a comprehensive regulatory framework within its legal and governmental infrastructure and on a State's regulatory activities. Consequently, the IAEA's Department of Nuclear Safety and Security has developed an integrated approach to the conduct of missions on legal and governmental infrastructure to improve their efficiency, effectiveness and consistency and to provide greater flexibility in defining the scope of the review, taking into account the regulatory technical and policy issues.

The new IAEA peer review and appraisal service is called the Integrated Regulatory Review Service (IRRS). The IRRS is intended to strengthen and enhance the effectiveness of the State's regulatory infrastructure in nuclear, radiation, radioactive waste and transport safety, whilst recognizing the ultimate responsibility of each State to ensure the safety of nuclear facilities, the protection against ionizing radiation, the safety and security of radioactive sources, the safe management of radioactive waste, and the safe transport of radioactive material. The IRRS is carried out by comparisons against IAEA regulatory safety standards with consideration of regulatory technical and policy issues.

The new regulatory service is structured in modules that cover general requirements for the establishment of an effective regulatory framework, regulatory activities and management systems for the regulation and control in nuclear safety, radiation safety, waste safety, transport safety, emergency preparedness and response and security. The aim is to make the IAEA services more consistent, to enable flexibility in defining the scope of the missions, to promote self-assessment and continuous self-improvement, and to improve the feedback on the use and application of the IAEA Safety Standards. The modular structure also enables tailoring the service to meet the needs and priorities of the Member State. The IRRS is neither an inspection nor an audit but is a mutual learning mechanism that accepts different approaches to the organization and practices of a national

regulatory body, considering the regulatory technical and policy issues, and that contributes to ensuring a strong nuclear safety regime. In this context, considering the international regulatory issues, trends and challenges, and to support effective regulation, the IRRS missions provide:

- a balance between technical and policy discussions among senior regulators;
- sharing of regulatory experiences;
- harmonization of the regulatory approaches among Member States; and
- mutual learning opportunities among regulators.

Regulatory technical and policy discussions that are conducted during IRRS missions take into account the newly identified issues coming from the self-assessment made by the host organization, visits to installations to observe inspections and interviews with the counterparts.

Other legally non-binding instruments can also be included upon request of the Member States, such as the Code of Conduct (CoC) on the Safety and Security of Radioactive Sources, which was adopted by the IAEA Board of Governors in 2004 and for which more than 85 Member States have written to the Director General of the IAEA committing themselves to implementing its guidance, and the Code of Conduct on the Safety of Research Reactors, which was adopted by the IAEA Board of Governors in 2005.

The IRRS concept was developed at the IAEA Department of Nuclear Safety and Security and then discussed at the 3rd review meeting of the Contracting Parties of the Convention on Nuclear Safety in 2005. The meeting acknowledged the importance of the IAEA regulatory peer reviews now recognized as a good opportunity to exchange professional experience and to share lessons learned and good practices. The self-assessment performed prior to the IAEA peer review mission is an opportunity for Member States to assess their regulatory practices against the IAEA safety standards. These IAEA peer review benefits were further discussed at the International Conference on ‘Effective Nuclear Regulatory Systems’ in Moscow in 2006, at which note was taken of the value of IRRS support for the development of the global nuclear safety regime, by providing for the sharing of good regulatory practices and policies for the development and harmonization of safety standards, and by supporting the application of the continuous improvement process. All findings coming from the Convention on Nuclear Safety review meetings and from the Moscow conference are inputs for the IRRS to consider when reviewing the regulatory technical and policy issues.

In addition, the results of the IRRS missions will also be used as effective feedback for the improvement of existing safety standards and guidance and the development of new ones, and to establish a knowledge base in the context of an integrated safety approach. Through the IRRS, the IAEA assists its Member States in strengthening an effective and sustainable national regulatory infrastructure thus contributing towards achieving a strong and effective global nuclear safety and security regime.

The Global Nuclear Safety Regime has emerged over the last ten years, with international legal instruments such as safety Conventions and Codes of Conduct and significant work towards a suite of harmonized and internationally accepted IAEA safety standards. The IAEA will continue to support the promotion of the safety Conventions and Codes of Conduct, as well as the application of the IAEA safety standards in order to prevent serious accidents and continuously improve global levels of safety.

With regard to the IRRS, the Director General of the IAEA, Dr Mohamed El Baradei, has stated that; ‘The General Conference Resolution of September 2006 related to measures to strengthen international cooperation in nuclear, radiation and transport safety and waste management: “recognizes the importance of an effective regulatory body as an essential element of national

nuclear infrastructure, urges Member States to continue their efforts to increase regulatory effectiveness in the field of nuclear, radiation and transport safety and waste management, and consider availing themselves of the Secretariat's new Integrated Regulatory Review Service (IRRS) and notes with satisfaction the increased interest of the Member States in the IRRS."

At his opening speech of the fiftieth regular session of the General Conference in 2006, the Director General stated that; "The Agency's safety review services use the IAEA Safety Standards as a reference point, and play an important part in evaluating their effectiveness. This year we began offering, for the first time, an Integrated Regulatory Review Service (IRRS). This new service combines a number of previous services, on topics ranging from nuclear safety and radiation safety to emergency preparedness and nuclear security. The IRRS approach considers international regulatory issues and trends, and provides a balance between technical and policy discussions among senior regulators, to harmonize regulatory approaches and create mutual learning opportunities among regulators".

In his introductory statement to the IAEA Board of Governors on 5th March 2007, the Director General said; "The newly established Integrated Regulatory Review Service (IRRS) is intended to help Member States enhance their legislative and regulatory infrastructures, and to harmonize regulatory approaches in all areas of safety. It will also be one of the most effective feedback tools on the application of Agency standards."

**INTEGRATED REGULATORY REVIEW SERVICE (IRRS)**

**REPORT TO**

**THE GOVERNMENT OF NAMIBIA**

**National Radiation Protection Service,  
Ministry of Health and Social Services**

Windhoek, Namibia

07 – 11 April 2008



# **REPORT**

## **INTEGRATED REGULATORY REVIEW SERVICE (IRRS)**

**Mission date:** 07 – 11 April 2008

**Official Counterpart Organisation:** National Radiation Protection Board

**Location:** Windhoek, Namibia

**Regulated facilities and activities:** medical, industrial, mining and research application

**Organized by:** IAEA

**IAEA Review Team:** Mr. Ibrahim Shaddad, Team Leader, Sudan

Mr. Rustem Paci, Reviewer, Albania

Mr. Karol SKORNIK, Team Coordinator, IAEA/NSRW

Mr. Diego Telleria, IAEA/NSRW

Mr. Mauri Riihonen, IAEA/NSNS

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**The number of recommendations, suggestions and good practices set out in this report is in no way a measure of the status of the regulatory framework. Comparisons of such numbers between IRRS reports from various countries should not be attempted.**

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## EXECUTIVE SUMMARY

At the request of the Government of Namibia represented by the Ministry of Health and Social Services, an international team of experts in radiation safety and security of radioactive sources visited the National Radiation Protection Service (NRPS) from 7 to 11 April 2008 to conduct an Integrated Regulatory Review Service (IRRS) mission to review Namibia's regulatory framework and its effectiveness. NRPS is the regulatory body responsible for radiation protection and safety in relation to activities involving radiation sources and radiation facilities in Namibia. The NRPS was the official counterpart to the mission.

The purpose of this IRRS mission was to conduct a peer review of Namibia's institutional framework and regulatory infrastructure for all regulated activities involving sources, facilities and activities, to review its regulatory effectiveness and to exchange information and experience in the areas considered by the IRRS. It is expected that the IRRS mission will facilitate regulatory improvements in Namibia from the knowledge gained and experiences shared by NRPS and the IRRS reviewers through the evaluation of the effectiveness of the regulatory framework.

The scope of the mission included activities regulated by NRPS with regard to its present status and those to be regulated in accordance with the legislation promulgated in 2005 which is still to be implemented.

The IRRS Review Team consisted of five senior regulatory experts from two Member States and three staff members of the IAEA. Major contribution, in the form of advance reference material, was provided by the NRPS.

The IRRS team carried out the review of NRPS in all relevant areas: legislative and governmental responsibilities; responsibilities and functions of the regulatory body and those of end-users (licensees) with reference to relevant enabling legislation; organization and activities of the regulatory body including the authorization process; review and assessment; inspection and enforcement; the development of regulations and guides; safety and security of radioactive sources; the quality and information management systems. In addition, the IRRS team reviewed activities related to public exposure control with emphasis on the safety of radioactive waste and operations in uranium mining and milling.

The conduct of the mission was based on intensive interviews and discussions, as well as working sessions with key personnel of the NRPS under the Ministry of Health and Social Services, and the Ministry of Mines and Energy. Working sessions included review of documentation provided before and during the mission. Moreover, three members of the team participated as observers in regulatory inspections at two licensee facilities (medical and industrial). Discussions also included policy issues related to regulatory control for the safety and security of radiation sources.

On the basis of mission findings, the team was able to arrive at conclusions and make recommendations with reference to the international safety standards and related IAEA requirements and guidance. The recommendations indicate where improvements are necessary or desirable to further enhance the legal and governmental infrastructure for radiation safety and security, and improve effectiveness of regulatory controls.

Key conclusions and recommendations of the mission are as follows:

- The Government of Namibia is to be commended on its efforts to develop effective regulatory framework for radiation safety and security of radioactive sources.
- The Atomic Energy and Radiation Protection Act, 2005 (the Act 2005) is comprehensive in relation to
  - activities involving radiation sources,
  - protection of the public and environment, and
  - safe management of radioactive waste, and

should be implemented as soon as possible. To this end, the Atomic Energy Board should be appointed, and the National Radiation Protection Authority (NRPA), with the appointment of its Director-General and staff, should be made operational with no further delay.

- In accordance with the Act 2005, the Government should ensure that the NRPA, as national regulatory body, be effectively independent from any national agencies having promotional role in application of radiation sources and radiation-based technology. This should also include effective independence with respect to the budget of the NRPA.
- Action should be taken to develop subsidiary instruments. This includes, as a matter of the highest priority, the enactment of Regulations Relating to Radiation Protection and the Safety of Radiation Sources. Furthermore, other outstanding regulations, as well as regulatory guidance and procedures in compliance with international standards, should be developed.
- In order to enhance the effective implementation of the Act 2005, decision-makers, stakeholders and operators of radiation sources should be made aware of the establishment and functions of the NRPA, as well as of related responsibilities.
- Notwithstanding that the Act 2005, and draft Regulations provide for an adequate regulatory framework for the radiological public and environmental protection in general, special attention should focus on the safety in management of radioactive waste and decommissioning of installations related to the uranium extraction and associated activities (mining milling, concentration, purification, etc).
- The Ministry of Mines and Energy is one of the national agencies responsible for health and safety issues in all mines in Namibia. However, the Minerals Act 1992 does not explicitly cover the radiological safety aspects. In the process of revising the Minerals Act 1992 due consideration should be given to the Atomic Energy and Radiation Protection Act 2005 which provides for establishing regulations and regulatory control of radiation safety in the mining sector including uranium mining and processing.

A complete list of the recommendations is provided in Appendix V.

## I. INTRODUCTION

At the request of the Government of Namibia an IAEA team of five, encompassing two experts from Member States and three staff members from the IAEA visited the NRPS, the regulatory body of Namibia from 07 to 11 April 2008 to conduct an Integrated Regulatory Review Service (IRRS).

The purpose of the mission was to conduct a review of the country's regulatory framework and the regulatory activities, to review the regulatory effectiveness of NRPS and to exchange information and experience in the areas considered by IRRS. The areas reviewed were: legislative and governmental responsibilities; authority, responsibilities and functions of the regulatory body; organization of the regulatory body; the authorization process; review and assessment; inspection and enforcement; the development of regulations and guides; safety and security of radioactive sources; the quality management and information management systems.

In addition, the regulatory technical and policy issues considered in this review provide a greater understanding of the regulatory issues that may have international implications and assist in addressing specific technical issues relevant to the regulation of radiation safety and security.

Prior and during to the mission, the NRPS made available a set of reference material consisting of a completed *Pre-appraisal Questionnaire*, as well as legal and regulatory documents.

The objectives of the mission were met by joint sessions on review of documentation provided by the NRPS, a series of interviews and work sessions with key NRPS staff. Some sessions were attended by a senior representative of the Ministry of Mines and Energy. Mission activities took place mainly at the NRPS headquarters in Windhoek. Part of the IRRS team participated as observers in regulatory inspections carried out at the Windhoek General Hospital (Department of Radiology) and the Namibian Road Authority (see Appendix III).

## II. OBJECTIVE AND SCOPE

The purpose of the mission was to carry out a review of the Namibian legal and governmental infrastructure for radiation safety and security of radioactive sources, and the effectiveness of the country's regulatory body (NRPS), and to exchange information and experience between the NRPS and the IRRS team with a view to harmonizing regulatory approach, in line with international Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS) and related requirements (GS-R-1).

The key objectives of this mission were to strengthen and enhance, where necessary, the country's regulatory infrastructure for radiation safety and the security of radioactive sources. This was accomplished by:

- a comprehensive review of relevant policy and technical issues;
- a thorough and objective evaluation of regulatory activities with reference to international safety standards and related undertakings,
- discussions with the Counterpart aimed at harmonizing regulatory approaches among Member States in line with the international safety standards, as well as by information and experience sharing on regulatory practices and lessons learned;
- work sessions on the *IRRS Questionnaire*, providing the Counterpart with an opportunity for self-assessment of the NRPS activities;
- review of activities related to public exposure control with emphasis on the safety of radioactive waste and operations in uranium mining and milling.

The mission was also an excellent learning process for its team members, providing better insights on country-specific issues related to discharging regulatory functions by the NRPS.

As a result of this intense and professional interaction, the mission members and the Counterpart were able to arrive at and agree on conclusions, recommendations and suggestions for improvement.

The scope of the mission, agreed with the Counterpart included:

- an overall appraisal of regulatory issues, including policy issues, for radiation safety and the security of radioactive sources in all areas of application,
- quality and information management systems including public information, as part of the regulatory infrastructure,
- a specific appraisal of regulatory issues relating to public exposure control including radioactive waste safety, as well as radiological protection in mining & milling operations, as thematic safety area of particular relevance to Namibia.

### **III. BASIS FOR THE REVIEW**

#### **a) Preparatory Work**

The preparatory work for the mission was carried out by the IAEA Team Coordinator, Mr Karol Skornik, NSRW/IAEA. The IRRS Team Leader was Mr Ibrahim Shaddad, a senior officer of the national regulatory body of Sudan. The full composition of the IRRS team is given in Appendix I. During the preparatory period, all documents of the advance reference material (ARM) including the *Pre-appraisal Questionnaire* were made available to the team. Programme arrangements as well as technical and logistical details were agreed with Mr Axel TIBINYANE, Head, NRPS, Ministry of Health and Social Services.

Substantial work was carried out prior to the mission. This included initial review and analysis of the ARM, the Country *Radiation and Waste Safety Infrastructure Profile* (RaWaSIP) for Namibia, preparation for the interviews and identification of additional reference material.

A team briefing was held on 6 April 2008 to discuss programme for the mission, to clarify the basis for the review, background, context and objectives of the IRRS and to agree on the methodology for review and evaluation.

#### **b) References for the Review**

The main reference documents for the mission, provided by the NRPS, and those available from the IAEA records, are listed in Appendix VI. Relevant IAEA safety standards and other reference documents used for the review are listed in Appendix VII.

#### **c) Conduct of the Review**

A thorough and comprehensive appraisal was conducted for all the areas under review. The process led to conclusions, as well as to recommendations and suggestions in those areas where outstanding issues or gaps were identified. The review was conducted through a series of work sessions involving interviews and discussions with NRPS Management, a regulatory inspection to a medical facility and an assessment of the ARM.

The team followed the agreed programme (time-table) for the mission (ref. Appendix II).

An entrance meeting was held on 7 April 2008, with the participation of Mr. Kahijoro Kahuure, Permanent Secretary, Ministry of Health and Social Services, Ms. Magdalena Nghatanga, Director, Primary Health Care, Ministry of Health and Social Services, Ms. Helena Itamba, Deputy Director, Ministry of Mines and Energy and NRPS staff. Opening remarks were made by Mr. Axel Tibinyane, NRPS and Mr. Karol Skornik, the IAEA Team Coordinator. A complete list of participants is presented in Appendix 1.

The meeting focused on the programme, basis for the review, available background information, objectives and scope of the mission, as well as on the appraisal methodology. The reviewers were also able to acknowledge ample information provided in the advance reference material.

Upon Counterpart's request, two exit meetings were held on 11 April 2008. The IRRS team was received by Mr. Joseph Iita, Permanent of Secretary, Ministry of Mines and Energy, and, separately, by Dr Norbert Forster, Deputy Permanent Secretary, Ministry of Health and Social Services. The meetings were attended by the NRPS Management.

The contents of draft mission report including findings, conclusions and recommendations, identified by the IRRS team were presented. Also, activities included in the draft Action Plan 2008-2009 were discussed. The first draft mission report and the Action Plan were handed over to the NRPS.

## 1. LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES

### **Policy Issues**

A plenary session on the regulatory policy issues was held with senior staff of the NRPS and representatives of the management in the Ministry of Health and Social Services. Discussions focused, among other things, on:

- independence of the NRPS;
- openness and transparency in regulatory activities including the involvement of stakeholders and public information;
- enhancing regulatory competence and effectiveness; and
- human resources and knowledge management.

There was a good perception of the importance of establishing a clear national policy to ensure safety and security of radioactive sources in the country. The participants agreed that the NRPS would be the main but not the only beneficiary of such policy. Summary of the discussions is presented below.

### ***Independence of the regulatory body***

Although more and more Member States have effective independent regulators, the issue of independence is still a challenge.

Key elements:

- Legislation establishes effectively independent regulatory body;
- Access to independent resources and technical advice;
- Funding independence;
- Balance between the Operators' and Regulators' responsibilities.

### ***Openness, transparency and stakeholders' involvement (including public communications)***

Openness and transparency in regulation is essential to encourage continuous improvement of performance and building public confidence. The international community promotes openness through several services. However, finding a proper balance between public availability of information and protection of confidential data remains a challenge.

Key elements:

- Strategies for engagement of stakeholders;
- Stakeholder involvement in regulatory decision making;
- The basis for regulatory decisions made available to stakeholders;
- Use of electronic communication, including the internet, for communication with stakeholders;
- Low threshold for informing stakeholders of nuclear and radiation safety related information.

### ***Leadership and management of safety***

Leadership in nuclear and radiation safety matters has to be demonstrated on the highest levels in an organization. The importance of human and organizational aspects of safety and safety culture is widely accepted. An effective management system is considered essential to support leadership in

order to maintain and continuously enhance a good safety culture. Assessment tools for safety culture are being developed. Advanced decision-making techniques are increasingly needed to apply resources where they will do the most good. Recent events have led to concern over complacency in some operating organizations and lack of regulatory effectiveness in identifying and proactively responding to early symptoms of emerging problems.

Key elements:

- Safety policy defined;
- Safety management system;
- Integration of the elements of the safety management system (safety culture, environment, quality, financial etc);
- Internal assessment of safety culture;
- Open dialogue between regulatory body and senior industry executives;
- Internal decision making appeal process;
- Value and ethics programmes;
- Self assessment;
- Regulatory experience included in appointing senior executives.

### **Legislative and statutory framework**

#### ***GS-R-1 § 2.2 (1)***

The legislative framework is provided by the Atomic Energy and Radiation Protection Act, 2005 (Act No. 5 of 2005) promulgated in May 2005. The Bill was prepared with the IAEA assistance. The Act provides for the safe use of atomic energy and nuclear technology for the protection of the general public and workers against the harmful effects of ionising radiation. Final draft Radiation Protection Regulations (Regulations 2006), also reviewed by the IAEA, are still to be enacted. The legislation appears to be consistent with the BSS and GS-R-1. It covers occupational and public radiological protection, medical exposure control, safety of radioactive waste management and safe transport of radioactive material.

It is noted, however, that the Act No.5 has not been implemented to date. With Regulations 2006 still in the draft form, the current legislative framework still relies on the provincial system that existed before the country's independence in 1990, with the National Radiation Protection Service (NRPS) of the Ministry of Health and Social Services discharging some regulatory functions.

The mission was informed that the President of Namibia has set the nation on the course towards nuclear energy as a long term goal. Subsequently, the Ministry of Mines and Energy has embarked on preparing a revised legislation even though the current Act has not been implemented.

### **Establishment of an effectively independent regulatory body**

#### ***GS-R-1 § 2.2 (2)***

There appears to be an issue with the effective independence of the regulatory body. The Act No.5 of 2005 (Chapter 5) provides for the establishment of a National Radiation Protection Authority (NRPA) as an "independent regulatory body". However, as the Act No.5 has not been implemented, the current regulatory system places the NRPS in the organizational structure of the Ministry of Health and Social Services (MoH), under the Department of Primary Health Care. Within the current system, there is a built in conflict of interest, and the regulatory authority is not independent. It is not certain whether the regulatory system provided by the Act 2005, will ensure the effective independence of the NRPA should it remain under the MoH. Furthermore, it is not clear whether the effective independence of the NRPA will not be affected by functions of the Atomic Energy



Board; established by the Act 2005 as an “advisory board on matters relating to radiation sources and atomic energy” [ref. Act No. 5, Art. 8 (g)].

**Regulatory body - assigned responsibilities, authority, and resources**

***GS-R-1 § 2.2 (3)***

The NRPA is vested by the Act No.5 of 2005 (Art.33) with the responsibilities for authorization, regulatory review and assessment, inspection and enforcement, and for establishing safety principles, criteria, regulations and guides.

However, in view of the fact that the Act No. 5 has not been implemented, these functions are not assigned to the present NRPS.

<b>CONCLUSIONS</b>	
<i>(1)</i>	<b>BASIS:</b> GS-R-1 §2
<i>CI</i>	<p><b>Conclusion:</b> While most of requirements for the establishment of a regulatory infrastructure are provided by the Act No. 5 of 2005 which is consistent with the international BSS and related IAEA requirements (GS-R-1), it is noted that:</p> <ul style="list-style-type: none"> <li>- Atomic Energy and Radiation Protection Act No.5 of 2005 has not been implemented,</li> <li>- Regulations Relating to Radiation Protection and the Safety of Radiation Sources (Regulations 2006) are available in the draft form,</li> <li>- present regulatory system is still based on the previous provincial legislation which was in force before Namibia became an independent state (1990),</li> <li>- security issues are not addressed by the Act No.5.</li> </ul>

<b>RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICE</b>	
<i>(1)</i>	<b>BASIS:</b> GS-R-1, Chapter 2: Legislative and Governmental Responsibilities
<i>R1</i>	<b>Recommendation:</b> The Atomic Energy and Radiation Protection Act, 2005 should be implemented in its entirety as soon as possible.
<i>R2</i>	<b>Recommendation:</b> Draft Regulations Relating to Radiation Protection and the Safety of Radiation Sources of 2006 (Regulations 2006) should be finalized and enacted, with due consideration of outstanding issues such as security, the incorporation of the Code of Conduct and its Guidance on Import and Export of Radioactive Sources, safety in mining and milling operations as well as quality and information management.
<i>R3</i>	<b>Recommendation:</b> Effective independence of the regulatory body including its funding should be ensured, in line with the provisions of Act No.5 of 2005 (Chapter 5).
<i>R4</i>	<b>Recommendation:</b> In the ongoing process of preparing legislative framework for nuclear power programme, due consideration should be given to the existing Act 2005 of May 2005, in line with the recommendation <i>R1</i> .

## 2. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

### **Regulatory body - fulfilling statutory obligations**

#### ***GS-R-1 § 3.1***

The Act No.5 makes provisions for the NRPA to define policies, safety principles and criteria. These statutory obligations are not being fulfilled under the present system.

#### ***GS-R-1 § 3.2 (1)***

Draft Radiation Protection Regulations 2006 have been completed, with IAEA assistance, but have not been enacted. Other subsidiary instruments including codes of practice and guidance documents have yet to be prepared.

#### ***GS-R-1 § 3.2 (2)***

The Act No. 5 gives responsibility to the NRPA to review and assess applications for authorizations. These activities have not been initiated, and no authorization has been issued under the provisions of the Act No. 5.

#### ***GS-R-1 § 3.2 (3) (i)-(x)***

The legislation makes provisions for the NRPA to issue, amend, suspend or revoke authorizations. This empowerment has not been implemented.

#### ***GS-R-1 § 3.2 (4)-(6)***

Under the provisions of the Act No.5, the NRPA is empowered to carry out regulatory inspections, recommend corrective actions to be taken by licensees, and take the necessary enforcement actions. However, at present, inspections held by the NRPS, are based on the old provincial law which is not compliant with the international BSS.

### **Regulatory body – discharging its main responsibilities**

#### ***GS-R-1 § 3.3 (1)-(5)***

(1) the process for dealing with applications (e.g. for authorizations) has not commenced to date; no authorizations have been issued.

(2) the NRPA does not exist; the NRPS has not implemented a process for changing conditions of authorization.

(3) guidance to the operator on developing and presenting safety assessment has not been issued by the NRPS.

(4) under the Act No.5, the NRPA may require any operator to provide proprietary information. The Act explicitly places a requirement on the NRPA to protect the confidentiality of such submissions. However, this requirement has not been met.

(5) the legislation allows the NRPA to reject an application for authorization. The requirement to provide an explanation of the reasons for rejecting a submission has not yet arisen as the NRPA does not exist.

**GS-R-1 § 3.3 (6)**

The requirement regarding communication with the public is partly fulfilled by the NRPS. There is limited exchange of information with governmental and other relevant bodies.

**GS-R-1 § 3.3 (7) (13)**

In light of an on-going extended transitional period before the Act No. 5 has been implemented and Regulations 2006 have been enacted, the requirement regarding analysis of operating experience and dissemination of lessons learned has not been fulfilled.

Within its limited powers, the NRPS, as the *de facto* regulatory body, applies international standards with regard to the safety of radiation sources, in line with Act No. 5.

For example, ultimate responsibility for safety rests with the operator. However, the NRPS is unable to ensure that this requirement is fulfilled through standard regulatory practice (issuing authorizations, conducting inspections and requesting safety assessments or appraisals from operators).

**Regulatory body – cooperation with other relevant authorities**

**GS-R-1 § 3.4**

There are no formal memoranda of understanding (MoUs) between the NRPS and other relevant authorities.

Contacts exist between the NRPS and the National Security Council (NSC), under the Presidency. However, the status of the NSC is still to be approved.

**Regulatory body – additional functions**

**GS-R-1 § 3.5**

The NRPS provides a TLD service for occupationally exposed workers. This type of service is quite common in the region, particularly in countries with the number of occupationally exposed workers not exceeding a few hundred, and where the sustainability of such a service at a national level, would pose a problem. On the other hand, licensees are reluctant to use such services abroad, due to higher costs, delays and losses experienced in the process.

In the case of the NRPS, with insufficient number of technical staff, this additional function of national service provider (primarily for the health sector), not only represents a potential conflict of interest, but significantly diminishes current capability of the NRPS as regulatory body.

CONCLUSIONS	
(1)	<b>BASIS:</b> GS-R-1 Chapter 3 (General): Responsibilities and Functions of the Regulatory Body
C2	<b>Conclusion:</b> Under the present system, functions the NRPS, as the <i>de facto</i> regulatory body, are being discharged in a limited scale. Furthermore, the NRPS is not duly empowered to discharge the regulatory functions. This is due to a major delay in the implementation of the Act No. 5 of May 2005.
C3	<b>Conclusion:</b> The NRPS is aware of the potential conflict of interest with regard to the provision of individual monitoring services to user institutions, It is noted, however, that if this additional function were not discharged by the NRPS, no other national organisation would presently be in a position to provide these services.

**RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICE**

<i>(1)</i>	<b>BASIS:</b> GS-R-1 Chapter 3; Responsibilities and Functions of the Regulatory Body
<i>R5</i>	<b><u>Recommendation:</u></b> In line with the Recommendation <i>R1</i> , the NRPS should follow the spirit and the letter of the Act No. 5 of 2005, pending the implementation of the Act and the establishment of the NRPA. It is further recommended that the highest priority be assigned to initiating the authorization process. The NRPS, in expectation that the Act will be implemented and the NRPA will be established as soon as possible, should adopt a graded approach, in due consideration of risks associated with regulated practices and categorisation of radioactive sources.
<i>S1</i>	<b><u>Suggestion:</u></b> While noting that the provision of individual monitoring services by the NRPS is not the responsibility of the Regulatory Authority, it is accepted that the current situation is dictated by prevailing conditions in the country. It is suggested, however, that, in the future, due consideration be given to assigning the responsibility for rendering these services to another body (e.g. Namibia Bureau of Standards, NBS) which would be certified by the NRPA when it has been established.

### 3. ORGANIZATION OF THE REGULATORY BODY

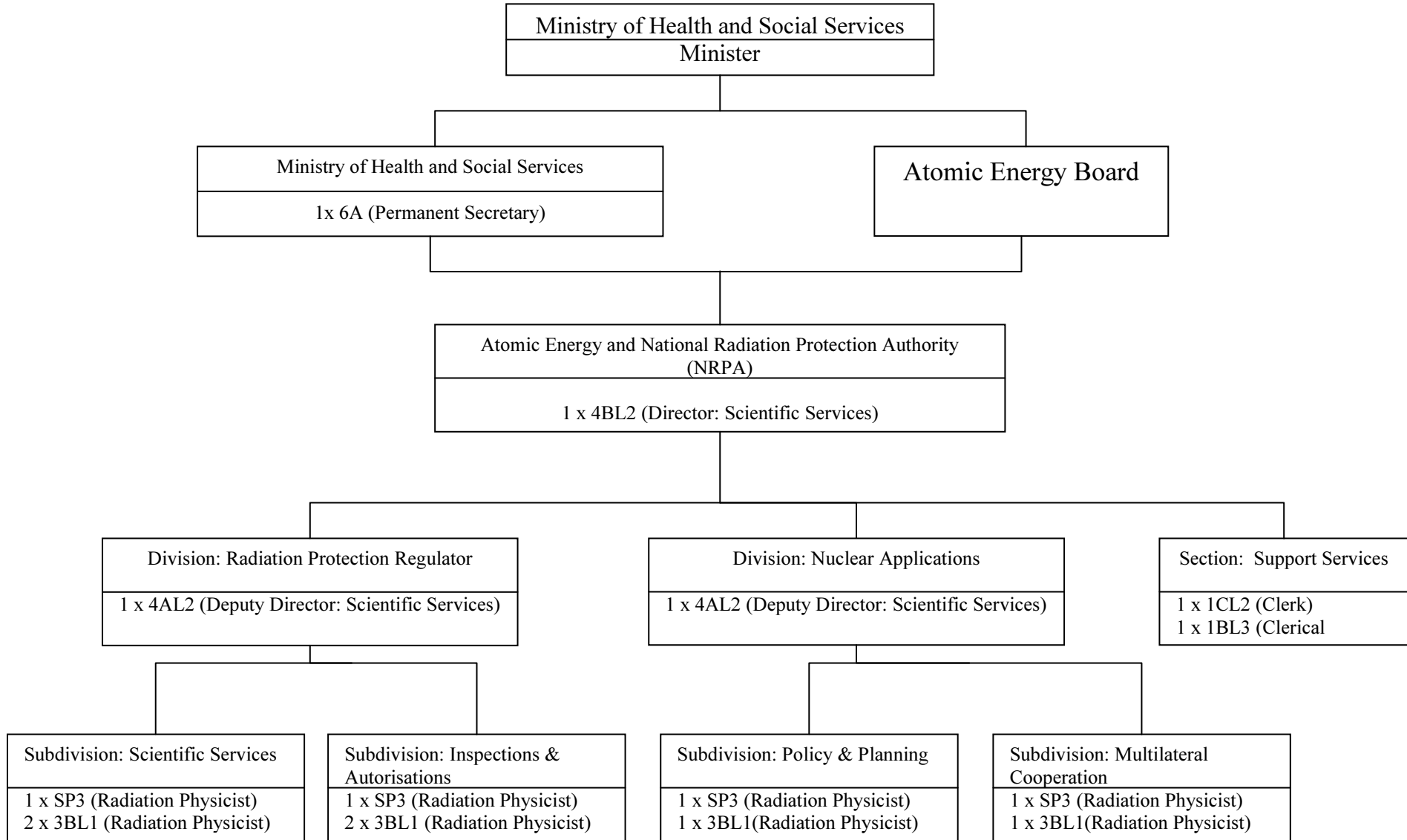
#### **Organizational structure, size and activities**

##### ***GS-R-1 § 4.1***

The requirement regarding the NRPS organizational structure, capable of discharging *de facto* its responsibilities and fulfilling its functions effectively and efficiently, is not met. The NRPS does not seem to have a well defined organizational structure. The ‘Service’, as it is presently called, is placed under the Department of Primary Health Care, Ministry of Health and Social Services.

The size of the NRPS does not seem to be commensurate with the extent of current practices. Activities of the NRPS are not based on the existing Act No. 5 of May 2005.

The organizational structure, presented below, relates to that of the National Radiation Protection Authority (NRPA) under the provisions of the Act No. 5. It represents the future status. The IRRS team was informed that, effective 1<sup>st</sup> April 2008, the new organizational structure was approved by the Minister.



## Use of consultants and contractors

### **GS-R-1 § 4.3**

The NRPS has not been using services of external consultants and contractors so far, although it is provided for by the Act No. 5 of May 2005.

## Staffing and Training of the Regulatory Body

### **GS-R-1 §4.6-4.8**

The Director-General of the NRPA is still to be appointed. Based on the approval of the organizational structure of the NRPA, the recruitment of new technical staff was due to commence as of April 2008. Subsequently, the training programme will be developed.

## Relations with the operators

### **GS-R-1 §4.10**

This requirement seems to be partly met in the inspections carried out by the NRPS (ref. Annex III of this report). However, with no authorization and enforcement systems in place, there is no sufficient basis for assessment of relationship between the regulatory authority and the operator.

## International Cooperation

### **GS-R-1 §4.11**

International cooperation in matters relating to regulatory infrastructure for the control of radiation sources is based on Namibia's membership of the IAEA and the country's participation in the IAEA Technical Cooperation Programme

No bilateral agreements on radiation safety with other countries are in place.

<b>CONCLUSIONS</b>	
<i>(1)</i>	<b>BASIS:</b> GS-R-1, Chapter 4
C3	<b><u>Conclusion:</u></b> Even though provisions of the Act 2005 are aimed at ensuring an effective independence of the regulatory body; the current regulatory system is not compliant with international standards in this respect. The effective independence is compromised by the organizational placing of the NRPA under the MoH&SS which also discharges promotional functions.  Action has been taken to implement the Act 2005. This is represented by - the most recent approval (as of 1 <sup>st</sup> April 2008) of organizational structure of the NRPA, and - the expected approval of the budget for the fiscal year 2008-2009.

**RECOMMENDATIONS, SUGESTIONS AND GOOD PRACTICE**

	<b>BASIS:</b> GS-R-1
<i>R6</i>	<b><u>Recommendation:</u></b> In the implementation of the Act No. 5 of 2005, the NRPA should be given a genuine status of an effectively independent regulatory authority, separated from the Ministry of Health and Social Services or any other national agency having promotional role in the application of nuclear or radiation-based technology.
<i>R7</i>	<b><u>Recommendation:</u></b> Government efforts should be expedited with a view to ensuring the establishment, as soon as possible, of the NRPA, with the appointment of competent staff.



#### 4. ACTIVITIES OF THE REGULATORY BODY

##### **Notification**

###### ***GS-R-1 §5.2, BSS §2.10, GS-G-1.5 §3.25***

The NRPS has established a national register of radiation sources, and is using the Regulatory Authority Information System (RAIS) for the register. However, the system of notification is still not in place.

##### **Authorization**

###### ***GS-R-1 §5.3***

The NRPS has a list of operators who should submit an application for authorization. However, the system of authorization has not been fully introduced. Some users have been licensed, based on the old provincial law. Relevant provisions of the Act No. 5 of May 2005 have not been implemented.

###### ***GS-R-1 §5.4***

Standard forms of application for authorization have been issued. However, no guidance has been provided to the operator on the format and contents of safety documentation to be submitted to the NRPS in support of application for authorization.

##### **Review and assessment**

###### ***GS-R-1 §5.7 - 5.11***

Written procedures for review and assessment of applications for authorization are still to be developed.

##### **Inspection**

###### ***GS-R-1 §5.14***

A programme for inspections is in place. It includes only announced inspections. However, due to shortage of regulatory staff and budgetary constraints, the frequency of inspections is relatively low. Only a few facilities are inspected on the average once a year.

The NRPS issued National Guidelines for Preparing Regulatory Inspections. The guidance has been disseminated to the operators.

There are no procedures requiring the completion of inspection reports within a specified time frame. Also, no procedures have been established on follow-up actions related to the implementation of corrective actions and recommendations indicated in the inspection reports.

##### **Enforcement**

###### ***GS-R-1 §5.18 - 5.23***

The Act No. 5 of May 2005 provides for enforcement authority of the regulatory body. However, the NRPS has not established an enforcement policy.

## Regulations and Guides

### **GS-R-1 §5.25- §5.28**

The Act No.5 gives the Atomic Energy Council the right to issue regulations and guides. This authority has not been exercised. Regulations 2006 are available in the draft, pending the establishment of the AEC. The present regulator, the NRPS, has not been empowered to issue subsidiary instruments.

<b>CONCLUSIONS</b>	
<i>(1)</i>	<b>BASIS:</b> GS-R-1, Chapter 5
<i>C4</i>	<b><u>Conclusion:</u></b> There is a need to establish and develop the system of notification, based on the provisions of the Act 2005
<i>C5</i>	<b><u>Conclusion:</u></b> There is a need to develop written procedures for authorization and to implement the authorization programme. This applies particularly to those relating to safety and security of radioactive sources, as well as to review and assessment of applications, having significant impact on the authorization process.
<i>C6</i>	<b><u>Conclusion:</u></b> There is a need to establish formal procedures related to the preparation for and the conduct of inspections. The same applies to the follow up actions for the implementation of recommendations of inspections
<i>C7</i>	<b><u>Conclusion:</u></b> The Act 2005 provides for enforcement actions by the regulatory body. However, at present, there is no policy regarding such actions. Also, no internal procedures have been issued on enforcement action to be taken during on-the –spot inspections. Such procedures can be introduced even in the current regulatory system.

<b>RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICE</b>	
<i>(1)</i>	<b>BASIS:</b> GS-R-1, Chapter 5
<i>R8</i>	<b><u>Recommendation:</u></b> The system of notification should be introduced as soon as possible, in accordance with provisions of the Act No. 5 o2005.
<i>R9</i>	<b><u>Recommendation:</u></b> As an important means of introducing the system of notification, it is recommended that the relevant requirements of the Act 2005 be made publicly known through appropriate media (press, TV, Internet).
<i>R10</i>	<b><u>Recommendation:</u></b> Written procedures related to the authorization process should be prepared as a matter of high priority.
<i>R11</i>	<b><u>Recommendation:</u></b> In accordance with Act 2005 (Art 21), written procedures for all stages of regulatory inspection process should be established on a priority basis.  This applies in particular to time frames for the - preparation of inspection reports,

**RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICE**

	<ul style="list-style-type: none"><li>- communication of inspection results and</li><li>- follow-up corrective actions</li></ul>
<i>R12</i>	<b><u>Recommendation:</u></b> The programme for regulatory inspections should include unannounced inspections.
<i>R13</i>	<b><u>Recommendation:</u></b> Written procedures related to enforcement actions should be prepared. Such procedures should be compliant with the provisions of the Act 2005 which is still to be implemented in its entirety.

## 5. SAFETY AND SECURITY OF RADIOACTIVE SOURCES

Namibia has not declared its support to the *Code of Conduct and Guidance on the Import and Export of Radioactive Sources*.

The IRRS team was informed that, once the Regulations come into force, authorizations for practices involving the use of radioactive sources will be issued on condition that the user enters into a legally binding agreement with the source provider to accept return of the source after it has reached the end of its useful life. For existing sources already in use in the country, at present, there is no repository or temporary storage facility for disused radioactive sources. Also, there is no suitable safe and secure storage area in place for radioactive sources held pending import or export authorization at border crossings and airports.

There are no established procedures recognising levels of safety and security based on source categorisation.

The Regulations do not provide for the security of radioactive sources during transport. There are no written procedures for the recovery of orphan sources. Initial contacts have been made with scrap metal dealers to ensure that no radioactive material is processed. However, no formal arrangements are in place.

CONCLUSIONS	
(1)	<b>BASIS:</b> BSS §2.34, 2.35, RS-G-1.9
C8	<b>Conclusion:</b> The Government has not declared its support to the <i>Code of Conduct on the Safety and Security of Radioactive Sources and Guidance on the Import and Export of Radioactive Sources</i> .
C9	<b>Conclusion:</b> There is a need to establish requirements and practice-specific procedures related to the safety and security of radioactive sources in all regulated activities. Specifically, procedures related to authorizations for export and import of radioactive sources and/or material, based on the provisions of the <i>Code of Conduct on the Safety and Security of Radioactive Sources</i> and its <i>Guidance on Import and Export of Radioactive Sources</i> , need to be developed and implemented.
C10	<b>Conclusion:</b> There is an urgent need of establishing a properly equipped centralised repository or temporary storage facility for disused and/or recovered radioactive sources.

RECOMMENDATIONS	
(1)	<b>BASIS:</b> BSS §2.34, 2.35, RS-G-1.9
R14	<b>Recommendation:</b> The Government may wish to declare its support to the <i>Code of Conduct and Guidance on the Import and Export of Radioactive Sources</i> .
R15	<b>Recommendation:</b> Provisions of the <i>Code of Conduct on the Safety and Security of Radioactive Sources</i> and its <i>Guidance on the Import and Export of Radioactive Sources</i> should be incorporated into the national legislation.

**RECOMMENDATIONS**

<i>R16</i>	<b><u>Recommendation:</u></b> Requirements and practice-specific procedures for ensuring safety and security of radiation sources should be established and implemented, with due consideration of the categorization of sources.
<i>R17</i>	<b><u>Recommendation:</u></b> A centralized repository or temporary storage facility for disused and/or recovered radioactive sources should be established.

## 6. QUALITY MANAGEMENT

A quality management system has yet to be established. This includes the administrative manual of the NRPS.

CONCLUSIONS	
<i>(1)</i>	<b>BASIS:</b> GS-R
<i>C11</i>	<b><u>Conclusion:</u></b> The quality management system of the regulatory body is still to be established.

RECOMMENDATIONS	
<i>(1)</i>	<b>BASIS:</b> GS-R
<i>R18</i>	<b><u>Recommendation:</u></b> The quality management system should be gradually introduced, following the implementation of the Act 2005. It is further recommended that the self-assessment tools, developed by the IAEA, be used in the process.

## 7. INFORMATION MANAGEMENT

### **Regulatory Activity Information Management**

The NRPS uses both the International Nuclear Information System (INIS) and the Radiation Safety Regulators Network (RaSaReN) as a source of radiation safety information. In general, this information is not shared with other national organisations. The NRPS is not currently a member of the Illicit Trafficking Data Base (ITDB).

Existing databases of the NRPS including the RAIS are protected. Files and offices are locked at night and there is a 24 hour security guard on site the premises of the Ministry of Health and Social Services, where the NRPS is located. A fire alarm is in place and operational.

The RAIS database is password protected with limited access. The NRPS is part of the Government IT security system. A back-up system for RAIS is in place.

General information on the work of the NRPS is available on the website of the Ministry of Health and Social Services, Science and Technology. The NRPS does not have its own website.

<b>CONCLUSIONS</b>	
<i>(1)</i>	<b>BASIS:</b> GS-R-3 §5.12, 5.21
<i>C12</i>	<b><u>Conclusion:</u></b> There is a need to establish the information management system of the regulatory body. Elements of such a system could be introduced even in the present regulatory system. This applies in particular to the protection of safety and security related sensitive information and the protection of IT systems and data bases.

<b>RECOMMENDATIONS</b>	
<i>(1)</i>	<b>BASIS:</b> GS-R-3 §5.12, 5.21
<i>R19</i>	<b><u>Recommendation:</u></b> The setting up of regulatory body information management system should be assigned high priority in the establishment of the NRPA (implementation of the Act 2005). Elements of such a system should be incorporated into the present regulatory framework. This applies in particular to the protection of safety and security related sensitive information and the protection of IT systems & data bases.

## 8. CONTROL OF PUBLIC EXPOSURE AND WASTE SAFETY

The scope of this appraisal included a joint review of activities related to public exposure control with emphasis on the safety of radioactive waste and operations in uranium mining and milling. To this aim, a specific appraisal of regulatory issues relating that thematic safety area of particular relevance to Namibia was conducted during the mission. The following fifteen topics were covered:

1. Regulatory Framework for the Control of Public exposure Non-associated with Radioactive Waste Management or Decommissioning Activities;
2. Control of Discharges;
3. Environmental Monitoring Associated With Authorised Practices for Public Radiation Protection Purposes;
4. Control of Foodstuffs and Selected Commodities;
5. Control of Chronic Exposures (Radon, Norm and Past Practices);
6. Control of Radioactivity in Materials for Recycling;
7. National Waste Management Policy and Strategy;
8. National Waste Management and Decommissioning Legislative and Regulatory Framework;
9. General Safety Provisions for Radioactive Waste and Decommissioning;
10. Predisposal Management of Radioactive Waste (Clearance and Storage dealt in separate sections);
11. Clearance Regime for Radioactive Waste;
12. Storage of Radioactive Waste;
13. Disposal of Radioactive Waste;
14. Decommissioning Facilities Containing Radioactive Materials;
15. Remediation.

Additionally, a **summary on the situation regarding uranium mining and associated activities** was prepared during the mission as the result of interviews held with representatives of the Ministry of Mines and Energy, and NPRS staff. This summary, which contains conclusions and recommendations, is presented in Appendix IX.

### 1. **Regulatory Framework for the Control of Public Exposure Non-Associated with Radioactive Waste Management or Decommissioning**

#### ***BSS SS No. 115***

Atomic Energy and Radiation Protection Act 2005 establishes in Chapter 6, General Provisions, Section 43, Regulations, that the Ministry (not yet) defined by the President may, on the recommendations of the Board (as defined in Chapter 2 of the mentioned Act) make regulations prescribing arrangements for the protection of the public against sources of radiation exposures and the protection of the environment against pollution (Section 43.1 (a)).

The above mentioned Act is promulgated but not implemented. Therefore, there are not regulations in place which consider the requirements established by the IAEA BSS and other related safety standards concerning public exposure.

However, it is worthy to mention that an advanced Draft Regulation 2006 includes requirements for operators and the regulatory body regarding the control of public exposure in accordance with the IAEA BSS and the good practices existing at the international level.

Within the Draft Regulation 2006 (Part IX: Public exposure Protection) the following safety requirements in consonance with the IAEA BSS can be identified:



- Assignment of main responsibilities to licensees to any exposure to public derived by a practice (Section 47.1).
- Requirement to licensees to establish and maintain a radiation protection programme in fulfilment of the authorisation conditions, including: optimization and limitation of the public exposures associated with normal use of sources under their responsibility, radiation safety policies, procedures and organizational arrangements; measures for ensuring the safety of sources, in order that the likelihood of public exposures be controlled; suitable and adequate facilities, equipment and services for the protection of the public, the nature and extent of which are commensurate with the magnitude and likelihood of the exposure; appropriate monitoring equipment and surveillance programmes to assess public exposure; adequate records of the surveillance and monitoring as required by the Standards (Section 47.2).
- Requirement to licensees for the control of visitors, ensuring that visitors be accompanied by a person knowledgeable about the protection and safety measures; provide adequate information and instruction to visitors to ensure appropriate protection of the visitors and of other individuals who could be affected by their actions; that adequate control over entry of visitors to a supervised area be maintained and that appropriate signs be posted in such areas (Section 48.1).

Part XIII (Requirements for Emergency Interventions) of the Draft Regulation 2006 includes the requirements on emergency plans or procedures, commensurate with the nature and magnitude of the risk involved (Section 74, 75).

The requirements for the control of consumer products capable of causing exposure radiation are covered in the Section 52 of the Draft Regulation 2006 in accordance with the IAEA BSS.

The technical skills, qualifications and experience necessary for the radiation safety officer required for all the practices are considered in the Section 30 of the Atomic Energy and Radiation Protection Act 2005. Additional considerations can be found in Sections 20 (Human Factors) and 21 (Qualified Radiation Safety Officer) in the Draft Regulation 2006. Detailed requirements about the needed qualifications, particularly in areas of public protection and environmental monitoring of practices are missing.

The Draft Regulation 2006 has included only general consideration for Quality assurance programmes in Part IV: Management Requirements, section 19.

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> BSS, SS No. 115
<i>C13</i>	<b><u>Conclusion:</u></b> The Atomic Energy and Radiation Protection Act 2005 establishes provisions for the regulation of the protection of the public against sources of radiation exposures and the radiological protection of the environment. As the Act is not implemented, the national infrastructure and the related regulations are not in place. This represents an important deficit which compromises the radiological safety of the population and the environment, which could be actually or potentially exposed to the hazardous effects of ionizing radiation.
<i>C14</i>	<b><u>Conclusion:</u></b> There exist a Draft Regulation 2006, which provides for a regulatory framework for the control of public exposure and protection of the environment, mostly in accordance with the International Regulations (like IAEA BSS and related safety standards and guidance) and best practices. This Draft needs a revision in order to be fully compatible with the mentioned international framework.

## RECOMMENDATIONS

<i>R20</i>	<b><u>Recommendation:</u></b> The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the protection of the population and the environment.
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## 2. Control of Discharges

### *BSS SS No. 115; (WS-G-2.3)*

As mentioned under topic 1 (see above), the Atomic Energy and Radiation Protection Act 2005 establishes in Chapter 6, General Provisions, Section 43, Regulations, that the Ministry (not yet) defined by the President may, on the recommendations of the Board (as defined in Chapter 2 of the mentioned Act) make regulations prescribing arrangements for the protection of the public against sources of radiation exposures and the protection of the environment against pollution.

While the mentioned Act does not state any specific reference to the application of dose limits (or dose constrains) for the effective control of radioactive discharges in order to protect the people and the environment, Section 43.2 and 43.3 establish that Regulations to be issued must take due account of or even may incorporate any guideline or standard published by the ICRP and the IAEA. In this context, any regulation developed in Namibia shall consider a dose limits to the members of the public of 1 mSv/year. In order to ensure that the protection of the public is optimised, considering societal and economical factors, a dose restriction of 0.3 mSv/year shall be considered as an upper bound for the optimization process (as established in the ICRP and IAEA recommendations, standards and guidance).

Atomic Energy and Radiation Protection Act 2005 establishes in section 21 the need to consider impact to the environment for the application of a license only in a general manner and without more clarification of the meaning of the impact in terms of radiological protection.

As it was discussed in topic 1, the above mentioned Act is promulgated but not implemented. Therefore, there are not regulations in place which consider the requirements established by the IAEA BSS, related to criteria for the control of exposures to the population from discharges of radioactive materials to the environment.

Again it is worth to mention that, in connection to the control of discharges, the Draft Regulation 2006:

- Does not clearly and explicitly establish the dose limit and the dose constrains to the members of the public (e.g., 1 mSv/year and 0.3 mSv/year respectively).
- Establishes requirements to the licensees about having adequate systems for controlling discharges of radioactive substances according to dose limits (to be) set by the Regulatory Body (Section 64.1)
- Does not have a clear definition of the regulatory process for control of discharges (radiological impact assessment, establishment of discharge limits, source and environmental monitoring, impact in other countries, etc).
- Refers in a general manner to application of the principle of ALARA and the use of dose constrain, but does neither makes clear requirements regarding the application of the principle of optimization (application of optimization methods) to control the discharges nor clearly define the associated criteria (dose restriction).

- Does not define the responsibilities of the Regulatory Body in connection to the control of discharges (e.g., establishment of regulations, setting of limits for discharges, review of applications to discharge radioactive materials to the environment, approval or rejection of these applications and the granting of authorisations, conduct of periodic inspections to verify compliance, enforcement against any violations of regulations, standards and license conditions, evaluation of the effectiveness of radiation protection measures for each authorized discharge together with the potential impact assessment of this discharge on humans and the environment.
- Establishes requirements for the consideration of non-radiological hazards associated with discharges which fulfil clearance or discharge limits from the radiation protection point of view (Section 64.3).
- Establishes requirements to licensees on monitoring programmes for the discharges of radioactive substances to the environment, to show they meet the authorized discharge limits and to enable the exposures to critical groups to be estimated, considering the appropriate records of the results of the monitoring programmes; the report the monitoring results to the Regulatory Body and the report to the Regulatory Body any significant increase in contamination that could be attributed to the radiation or radioactive discharges emitted by sources under their responsibility (Section 51)

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> BSS SS No. 115; (WS-G-2.3)
<i>C15</i>	<b><u>Conclusion:</u></b> The Atomic Energy and Radiation Protection Act 2005 establishes provisions for the regulation of the protection of the public against sources of radiation exposures and the radiological protection of the environment and that the regulations to be issued must take due account of any guideline or standard published by the ICRP and the IAEA . It is understood that, in order to fulfil the mentioned international recommendations dose limits and dose constrains for optimization must be considered in the regulations for the control of radioactive discharges to the environment. The conclusion regarding the lack of implementation of the Act is the same than in C13.
<i>C16</i>	<b><u>Conclusion:</u></b> There exists a Draft Regulation 2006, which provides for a regulatory framework for the control of radioactive discharges applying dose limits (or constrains) to the members of the public, and establishes the need to consider the impact to the environment. This Draft needs some revision in order to be fully compatible with the international standards, guidance, recommendations and best practices.

<b>RECOMMENDATIONS</b>	
<i>R21</i>	<b><u>Recommendation:</u></b> The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for control of discharges of radioactive material to the environment.

### **3. Environmental monitoring associated with authorized practices for public radiation protection purposes**

***BSS SS No. 115; (RS-G-1.8)***

As mentioned under topic 1 and 2 (see above), the Atomic Energy and Radiation Protection Act 2005 establishes, in Chapter 6, General Provisions, Section 43, Regulations, that the Ministry (not yet) defined by the President may, on the recommendations of the Board (as defined in Chapter 2 of the mentioned Act), make regulations prescribing arrangements for the protection of the public against sources of radiation exposures and the protection of the environment against pollution.

While the mentioned Act does not state any specific reference to the need of environmental monitoring, it contains provisions regarding the compliance of any condition to which a licence has been issued (Section 23, Compliance Order). In these contexts the source and environmental monitoring is the only way to ensure compliance with the discharge limits established to protect human (members of the public) and environment.

Once more, as it was discussed in topic 1 and 2, the above mentioned Act is promulgated but not implemented. Therefore, there are not regulations in place which consider the requirements established by the IAEA BSS, related to source and environmental monitoring programmes.

Again it is worth to mention that, in connection to the monitoring programmes, the Draft Regulation 2006:

- Establishes requirements to licensees on the parameters necessary for verification of compliance of the licence (Section 23.1)
- Establishes requirements for the equipment (maintenance, calibration, etc) and verification procedures (Section 23.2).
- Establishes criteria for the monitoring programme in accordance to the risk associated with the sources (Section 51).
- Establishes obligations for recording and notification to the regulatory body on regular intervals and when any abnormal result could appear (Section 51).
- Does not consider the different stage of the operation of the facility (pre-operational investigations, normal operation, decommissioning, post-closure).
- Does not establish the responsibilities of the Regulatory Body (specify technical requirements for monitoring, checking of the monitoring data provided by operators, provision of evidence to the public that authorized sources of exposure are properly monitored and controlled).
- Does not establish how the public is informed on environmental monitoring programmes and results (including an explanation of their significance).
- Does not establish the complementary requirements to the licensee in case of any significant increase in environmental radiation fields or contamination (e.g.: a description of the investigations that have been set up, the reporting of the preliminary results, the immediate actions that have been taken in relation to operations; the foreseen actions for the immediate future, etc).
- Does not establish requirements for a nationwide environmental monitoring programme (independent from those related to the practices).

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> BSS SS No. 115; (RS-G-1.8)
<i>C17</i>	<b><u>Conclusion:</u></b> The Atomic Energy and Radiation Protection Act 2005 establishes provisions for the regulation of the protection of the public against sources of radiation exposures and the radiological protection of the environment. The Act has provisions regarding the compliance of the conditions of the license. Source and environmental monitoring is the only way to ensure compliance with the authorized discharge limits established to protect people and the environment and, therefore, the obligation is implicit in the mentioned Act. The conclusion regarding the lack of implementation of the Act is the same than in C13.
<i>C18</i>	<b><u>Conclusion:</u></b> There exists a Draft Regulation 2006, which provides for a regulatory framework for the environmental monitoring, mainly in accordance with the IAEA BSS. This Draft needs some revision in order to be fully compatible with the international standards, guidance, recommendations and best practices.

<b>RECOMMENDATIONS</b>	
<i>R21</i>	<b><u>Recommendation:</u></b> The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the environmental monitoring to ensure compliance with the requirements regarding public exposure control.

#### **4. Control of foodstuffs and selected commodities**

##### ***BSS SS No. 115***

No radiological monitoring system for foodstuff and commodities has been developed, either in regulations or at technical level in Namibia.

There are neither regular nor sporadic requirements for control of foodstuff within the export/import process.

The National Radiation Protection Agency has only simple monitoring equipment like portable gamma detector and portable radionuclide identifier (gamma spec). At the Department of Physics in the University of Namibia there is a HP Germanium detector and gamma spectrometry associated system which is used for research.

There are not arrangements between NRPA and the University to facilitate the use of the spectrometry system when necessary.

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> BSS SS No. 115
<i>C19</i>	<b><u>Conclusion:</u></b> Namibia has not established capability for controlling the levels of radioactivity in foodstuff and selected commodities. While in view of the current degree of development of the activities in application of radionuclides in medicine and industry, it could be not necessary to maintain fully operative dedicated laboratories for this purpose, it could be convenient to have the minimal technical capabilities in order to be

<b>CONCLUSIONS</b>	
	able to do this type of measurements when necessary (e.g.: imports of food from places contaminated by past practices or accidents). Particular attention should be paid to Uranium mining activities which could have impact on foodstuff and commodities (See Annex IX).

<b>RECOMMENDATIONS</b>	
<i>R22</i>	<b><u>Recommendation:</u></b> Evaluate the national capabilities for doing foodstuff and commodities control within the regulatory body or in other national institute (e.g.: University of Namibia). Make provisions to obtain the necessary equipment (e.g.: simple reliable gamma spectrometry systems) and/or the necessary arrangements with the University of Namibia to facilitate the cooperation in this issue. (Note: The necessary training and provision of equipment could be obtained through formal agreements with the IAEA Technical Cooperation Programme). Investigate potential impact of uranium mining activities (See Annex IX)

#### **5. Control of chronic exposures (radon, NORM and past practices)**

##### ***BSS SS No. 115***

The situation regarding chronic exposure is not characterized in Namibia. However there is a large presence of uranium mining activities (See Annex IX).

There exist currently no formal means to control and monitor the chronic exposures to radiation, either from a technical or legal perspective. No specific consideration has been given in the Draft Regulation 2006 to address chronic exposures.

There is a need of technical capabilities to measure radon associated to the uranium mining, milling and purification activities.

There are no oil or gas extraction activities which could lead to the existence of NORM. However, regarding other mining activities occurring in the country (like gold mines, etc) there has not been a research to determine the level of chronic exposures associated.

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> BSS SS No. 115
<i>C20</i>	<b><u>Conclusion:</u></b> The presence of NORM related to uranium mining and associated activities which are taking place in Namibia is not being adequately evaluated and there are no technical and regulatory provisions to assess and, if necessary, control the impact to the public and the environment.

<b>RECOMMENDATIONS</b>	
<i>R23</i>	<b><u>Recommendation:</u></b> Include in the revision of the Draft regulation 2006 considerations for the NORM from the uranium mining activities.
<i>R24</i>	<b><u>Recommendation:</u></b> Establish urgently a national programme to characterize and consequently control the radiological impact of NORM from uranium mining. Make provisions to obtain the

<b>RECOMMENDATIONS</b>	
	necessary training and measurement equipments. (Note: The necessary training and provision of equipment could be obtained through formal agreements with the IAEA Technical Cooperation Programme).

## **6. Control of radioactivity in materials for recycling**

There are no explicit requirements in legislation with regard to control of radioactivity in recycling materials.

The detailed inventory of recycling activities is unknown. However there are no indications of relevant scrap metal recycling activities in the country (accumulation, processing or import-export activities) which could be considered a high risk of unexpected appearance of radioactive materials (orphan sources).

<b>CONCLUSIONS</b>	
<i>C21</i>	<b><u>Conclusion:</u></b> The control of recycling materials (scrap metal) regarding presence of out of regulatory control radiation sources seems not to be a priority in Namibia.

<b>RECOMMENDATIONS</b>	
<i>R25</i>	<b><u>Recommendation:</u></b> Attention should be paid to potential scenarios which could involve presence of radioactive orphan sources capable to appear in the recycling activities and impact on workers, public and environment (e.g., importation or transport of large quantities of scrap metal materials, Etc)

## **7. National Waste Management Policy and Strategy**

### ***WS-R-2; (DS353)***

The radioactive wastes in Namibia which need a national policy and strategy definition are:

- Uranium mining, milling and processing wastes (e.g., pending a survey and definition).
- Nuclear medicine radionuclides (e.g., storage for decay and clearance).
- Disused medical (Co-60 teletherapy, Cs-137 low dose rate brachytherapy, Ir-192 High dose brachytherapy) (e.g., return to the providers).

No national policy or strategy regarding radioactive waste management was developed as a separate document.

However, some elements of the policy and strategy are included in the Draft regulation 2006:

- Radioactive classification system.
- Responsibilities (operators, regulatory authority, operator of the central waste storage facility).
- Safety principles for the safe management of radioactive waste.
- Return to the manufacturer policy.
- Storage and disposal options.

Regarding past practices, up to the knowledge of NRPA, there are not significant amount of disused sealed radioactive sources from the past. Concerning the waste associated to uranium mining, the situation has not been fully evaluated but, there are no indications of notable past activities (different from the ones which are currently operating) which could represent a significant problem.

NRPA considers that, in view of the current policy of “return to provider” there is no need to consider a mayor central storage facility in the country.

However, Namibia does not have provisions in existing or planned legislations/regulations for any storage facility under the control of the State for, at least, operational necessities related to:

- Potential orphan sources and wastes for accidents (if they occur),
- Sources retained because of regulatory or legal problems (sanctions, embargo, etc) trade problems (delays in expo/import authorizations, etc) or illicit acts.

NRPA considers that in view of the current policy of “return to provider” and the inventory of sources there is no need to consider a disposal option for sealed sources.

There is a need for the definition of the disposal option for the uranium mining and associated activities radioactive waste (e.g., on-site disposal of the uranium mining tails).

The situation of the uranium mining in Namibia is considered in Annex IX.

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> WS-R-2; (DS353)
C22	<p><b><u>Conclusion:</u></b>            There is not a national policy and strategy regarding radioactive waste management. However, some elements of the policy and strategy for the radioactive waste management are considered in the Draft regulation 2005, but need to be completed. The existence of this policy and strategy will facilitate the development and implementation of an adequate regulatory framework and infrastructure.</p>

<b>RECOMMENDATIONS</b>	
R26	<p><b><u>Recommendation:</u></b>            Prepare a national policy and strategy regarding waste management taking into account those elements found in the Draft Regulation 2006 and adding the necessary components. There should be provisions for ensuring that the State have a minimal capacity for storage of radioactive waste which, for any reason, may not be under control of an operator. The IAEA has a TC Regional Project RAF9037 which includes Namibia as one of the member states and it was developed to assist countries in the development of their national policies and strategies. Namibia can ask for assistance under this framework.</p>

## **8. National Waste Management and Decommissioning Legislative and Regulatory Framework** ***WS-R-2; (DS353)***

As mentioned before, the Atomic Energy and Radiation Protection Act 2005 establishes in Chapter 6, General Provisions, Section 43, Regulations, that the Ministry (not yet) defined by the President may, on the recommendations of the Board (as defined in Chapter 2 of the mentioned Act) make regulations. Among these regulations considered necessary in the Act, there are several articles which have direct or indirect connection with the safety management of the radioactive waste and decommissioning, for instance:

- Prescribing arrangements for the protection of the public against sources of radiation exposures and the protection of the environment against pollution (Section 43.1 (a)).
- Prescribing structural or other design requirements for premises used or intended to be used in connection with the installation, use or storage of radiation sources or nuclear material (Note: radioactive waste is a source of radiation and could be nuclear material, e.g.: uranium mining and related activities wastes), (Section 43.1 (c)).



- Relating to the safe transport of radiation sources and nuclear material (see Note in bullet above), (Section 43.1 (h)).
- Relating to the safe management of radioactive waste and notices required to be published for public information about radioactive waste disposal sites (Section 43.1 (i)).
- Prescribing the procedures, steps and requirements for sources which are taken out of operation (Section 43.1 (j)).

The Act is not yet implemented and there are not more detailed requirements related to the decommissioning and safe waste management in accordance with IAEA BSS and other related international safety standards and guidance.

Again it is worth to mention that, in connection to decommissioning and safe radioactive waste management the Draft Regulation 2006:

- Includes decommissioning in a very general manner in the Scope (Section 3) and in Safety Assessment and Verification (Section 24), needing more elaboration.
- Radioactive waste management requirements are considered in Sections 57 to 72.
- There are no adequate provisions for financial resources for decommissioning and waste management. Only financial provisions for storage of disused sources are somehow considered in Section 59.7 (at the moment of transferring the sources to the responsible organization in the State).
- There are no specific requirements for the uranium mining and associated activities radioactive waste (which is the most significant source of radioactive waste in the country and needs special consideration) (For more details, See Annex IX).

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> WS-R-2; (DS353)
C23	<b><u>Conclusion:</u></b> The Atomic Energy and Radiation Protection Act 2005 establishes many provisions for the regulation of the safety management of the radioactive waste and decommissioning. Some additional requirements are needed, particularly for the financial resources. The conclusion regarding the lack of implementation of the Act is the same than in C13.
C24	<b><u>Conclusion:</u></b> The lack of adequate provisions for the financial resources to deal with decommissioning and waste management of the uranium mining activities (and the associated nuclear installations) could result in important burdens for the estate in the future which could not have enough resources to protect the population and the environment from the radiological hazards, in accordance with the international recommendations, standards and guidance.

<b>RECOMMENDATIONS</b>	
R27	<b><u>Recommendation:</u></b> The government of Namibia must urgently establish a legal requirement based on an assessment of the national situation regarding uranium mining wastes and the experience at the international level to ensure financial resources to deal with the decommissioning and radioactive waste management, particularly for uranium mining related activities.

**9. General Safety Provisions for Radioactive Waste and Decommissioning**  
***BSS SS No. 115; WS-R-2; (DS353)***

Safety criteria for the radioactive waste management and decommissioning is considered in the Draft Regulation 2006 as follows:

- There are no prescribed dose limits for workers, members of the public and relating to emergency situations and chronic situations (Annex 1 mentioned if Draft Regulation 2006 is missing)
- General safety requirements for occupational exposure, public exposure and protection of the workers in emergency situations are adequately considered in Part VII, Part IX, and Part XII Section 77.
- Requirements for the protection and safety during the practices to be optimised are considered in Section 15.
- Requirements to ensure that radioactive waste arising are kept to the minimum practicable by design, construction and operation of facilities is covered in Section 61.
- Requirements on potential effects of the management of radioactive waste beyond national borders and the establishment of requirements for environmental protection associated with predisposal waste management are missing.
- Requirements for the safe transport of the radioactive waste are considered in Section 61.5.

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> BSS SS No. 115; WS-R-2; (DS353)
C25	<b><u>Conclusion:</u></b> Being a high level legislation, the Atomic Energy and Radiation Protection Act 2005 does not establish detailed safety criteria and requirements for the operation of radioactive waste management installations and/or during the decommissioning activities. Most of these criteria must be at the level of regulations and, as the Act is not implemented, these regulations do not exist and this deficiency has the same conclusions than to those in C13.
C26	<b><u>Conclusion:</u></b> There exists a Draft Regulation 2006, which provides for a regulatory framework for the waste management during the operation and during the decommissioning activities, mainly in accordance with the IAEA BSS. However, this Draft is not fully compatible with the international standards, guidance, recommendations and best practices.

<b>RECOMMENDATIONS</b>	
R28	<b><u>Recommendation:</u></b> The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the safe waste management during the operation and during the decommissioning.

## **10. Predisposal Management of Radioactive Waste**

### ***WS-R-2; (DS353)***

The following findings are relevant for any radioactive waste in the country but moreover for the wastes resulting from uranium mining and related activities in Namibia (see Annex IX).

Neither requirements nor criteria are established by the Regulatory Body pertaining to the safety of facilities, processes and operations for predisposal radioactive waste management for:

- handling and transportation of radioactive waste and;
- acceptance of waste packages for storage or disposal.

There appears to be no regulatory requirements to ensure an overall process for the siting and design of predisposal facilities for radioactive waste, in order to provide reasonable assurance of safety during their anticipated operational period and eventual decommissioning, specifically how the following safety issues should be systematically addressed:

- the investigation of the proposed region to evaluate its present and foreseeable future characteristics, the distribution of the population and the present and future uses of land and water;
- the determination of ambient radioactivity in the region as a baseline for future investigations;
- estimates of expected and potential releases of radioactive material over direct and indirect pathways;
- radiological exposure of the population in operational states of the facility as well as under accident conditions and;
- evaluation of potential effects from natural and human induced external events (e.g. seismic events, meteorological events, geotechnical impacts, aircrafts, explosions).

There is no evidence that the Regulatory Body ensures that the requirements for handling, transportation, storage and disposal of waste packages are fulfilled during the processing of radioactive waste.

There is no evidence that requirements are in place for characterization of radioactive waste in terms of its physical, chemical, radiological and biological properties.

It was not possible to conclude how the Regulatory Body determines the acceptability of the waste package, and how this information is used for:

- process control and;
- assurance that the waste or waste package will meet acceptance criteria for storage, transportation and disposal.

The Regulatory Body does not require adequate provisions for identifying, assessing and dealing with waste acceptance criteria.

The regulatory requirements for appropriate conditioning of radioactive waste to ensure waste forms are compatible with the selected storage; disposal or anticipated disposal option need to be developed are missing.

There are no regulatory requirements that ensure waste packages are designed and produced so that the radioactive materials are contained under:

- normal conditions and
- accident conditions that may occur in handling, storage, transport and disposal.

The legislation does not require the development of adequate safety and environmental impact assessments to be carried out for radioactive waste management facilities and activities, addressing:

- the facility's structures, components and equipment;
- the waste to be processed;
- all associated operational work activities and;
- both normal operation and anticipated incidents and accidents.

There was not shown how the safety assessments are made and used as a basis for:

- granting any authorization and;
- the controls to be put in place.

Updating of safety assessments and environmental assessments must be a periodic activity which needs to be ensured by written requirements.

The Team could not determine if any regulatory provisions to ensure radioactive waste management facilities are operated in accordance with the requirements in force and the conditions approved by the Regulatory Body to maintain safety during the operational period and decommissioning stage.

There was no evidence in written material that the regulatory body requires the operator of a radioactive waste management facility to:

- prepare and implement appropriate safety procedures;
- apply good engineering practice;
- prepare from the design stage, and periodically update, plans for shutdown and decommissioning, including the transition period, to be approved by the regulatory body, and
- keep records.

There was no evidence that managerial and technical measures are required by the regulatory body to ensure that waste is processed in such a way that:

- the safety of operations is appropriately ensured under normal conditions;
- measures are taken to prevent the occurrence of incidents or accidents; and
- provisions are made to mitigate the consequences should accidents occur.

There was no evidence of the considerations, in processing waste, required by the Regulatory Body, to address safety issues arising from:

- possible reactions within the waste form;
- possible reactions between the waste and the container;
- the stability of the container;
- the compatibility of the waste package with the storage environment and;
- the disposal option.

There was no evidence that regulatory requirements for radioactive waste management facilities ensure timely reporting to the Regulatory Body:

- of incidents and accidents;
- information that calls into question any aspect of safety;
- non-compliance with acceptance criteria or;
- actions taken or proposed to rectify the situation if events listed above occur.

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> WS-R-2; (DS353)
C27	<b><u>Conclusion:</u></b> Being a high level legislation, the Atomic Energy and Radiation Protection Act 2005 does not establish detailed safety criteria and requirements for the predisposal of radioactive waste operations and installations. Most of these criteria must be at the level of regulations and, as the Act is not implemented, these regulations do not exist and this deficiency has the same conclusions than to those in C13. This conclusion is significantly relevant for uranium industry related wastes,
C28	<b><u>Conclusion:</u></b> There exists a Draft Regulation 2006, which provides for a regulatory framework for the waste management including predisposal activities. However, this Draft is not fully compatible with the international standards, guidance, recommendations and best practices.

<b>RECOMMENDATIONS</b>	
R29	<b><u>Recommendation:</u></b> The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the safe waste management including predisposal activities (and with particular attention to uranium industry wastes). The resulting regulatory requirements should consider aspects mentioned under topic 10.

## **11. Clearance Regime for Radioactive Waste**

### ***WS-R-2; (DS353); (RS-G-1.7)***

Conditions for exclusions, exemptions and clearance are considered in the Draft Regulations 2006 in Sections 5, 16 and 17.

Clearance is considered in the Draft Regulation 2006 in connection with discharges (Section 64) and needs more elaboration for the area of radioactive waste management, and decommissioning.

Requirements to take due account of non-radiological hazards are included in Section 64.3 of the mentioned Draft regulation.

There are no provisions to verify that materials to be released are within clearance levels and those that are not are treated as radioactive waste (particularly for the uranium mining activities).

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> WS-R-2; (DS353); (RS-G-1.7)
C29	<b><u>Conclusion:</u></b> Being a high level legislation, the Atomic Energy and Radiation Protection Act 2005 does not establish detailed safety criteria and requirements for the clearance of radioactive material from the regulatory control. Most of these criteria must be at the level of regulations and, as the Act is not implemented, these regulations do not exist and this deficiency has the same conclusions than to those in C13.

<b>CONCLUSIONS</b>	
<i>C30</i>	<p><b><u>Conclusion:</u></b> There exists a Draft Regulation 2006, which provides for a regulatory framework for the radioactive waste management, covers clearance aspects mainly in accordance with the IAEA BSS. However, this Draft is not fully compatible with the international standards, guidance, recommendations and best practices.</p>

<b>RECOMMENDATIONS</b>	
<i>R30</i>	<p><b><u>Recommendation:</u></b> The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the safe waste management including clearance of materials from the regulatory control, including uranium industry wastes.</p>

## 12. Storage of Radioactive Waste

### *WS-R-2; (DS353)*

The existing radioactive wastes in Namibia, apart from the uranium mining tails, consist in disused radioactive sources in medicine and industry. Except for short half life radionuclides used in nuclear medicine (which are temporarily stored for decay and then cleared) the radioactive waste comprises sealed sources applied in medicine and industry.

These radioactive sources, when became disused, are stored temporarily in the premises of the operators, waiting for return to the providers. There are not central storage or disposal activities in Namibia.

There are not any State facility for temporary storage of radioactive waste which could be needed as the result of regulatory actions (sanctions, seize of radioactive sources, accidents, illicit actions, etc)

Requirements and criteria related to the temporary and long term storage of disused sources are considered in the Draft Regulations 2006, in Part XI, Sections 57 to 72.

See also, findings under topic 7 and Annex IX (Uranium mining related findings, conclusions and recommendations).

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> WS-R-2; (DS353)
<i>C31</i>	<p><b><u>Conclusion:</u></b> Central Storage facility is not considered an urgent necessity in Namibia, considering the existing inventory and the current policy of “return to provider”. However, there is need to consider the necessity to cover, at least, operational necessities related to potential orphan sources and accidents (if they occur), sources retained because of regulatory or legal problems (sanctions, seize by force, Etc), trade problems (delays in expo/import authorizations, etc).</p>
<i>C32</i>	<p><b><u>Conclusion:</u></b> The situation in Namibia of Uranium mining and related activities radioactive waste needs and urgent analysis and consideration (See Annex IX).</p>

<b>RECOMMENDATIONS</b>	
<i>R31</i>	<b><u>Recommendation:</u></b> Assess the necessity of some minimal storage facility under the control of the states or appropriate formal arrangements with users with own storage capabilities and with capacity to receive temporally orphan sources recovered by the state. Seek assistance within IAEA Technical Cooperation Projects in order to define and implement a minimal storage capacity under State control.
<i>R32</i>	<b><u>Recommendation:</u></b> Give attention to uranium mining and related activities radioactive waste (See Annex IX).

### 13. Disposal of Radioactive Waste

#### *WS-R-1*

Disposal of radioactive waste is not foreseen as a necessity at the moment in Namibia, except for the uranium mining and associated activities radioactive wastes. There is not a survey or assessment of the existing or future radioactive wastes potentially coming from the uranium mining activities.

In the Draft Regulations 2006, there exist provisions for waste storage and disposal but only for radioactive sources or nuclear material. There are no provisions for the uranium mining tails (e.g., in situ disposal).

See findings under topics 7 and 12.

See findings, conclusions and recommendations in Annex IX regarding disposal of radioactive waste from uranium mining activities.

### 14. Decommissioning of Facilities Containing Radioactive Materials

#### *WS-R-5*

Relevant decommissioning programmes and activities are only foreseeable in the case of uranium related activities (including the installations for uranium concentration and processing). There are not special provisions for the decommissioning of these activities in the Draft regulations 2006.

The Ministry of Mines and Energy on Namibia has some requirements in their regulations regarding financial provisions for the decommissioning of uranium mining related installations (mines, tails, all associated industrial installations on the sites, e.g.: uranium purification installations) (See Annex IX).

<b>CONCLUSIONS</b>	
	<b>BASIS:</b> WS-R-5
<i>C33</i>	<b><u>Conclusion:</u></b> There are no special provisions in the Draft Regulations 2006 regarding the special case of decommissioning of uranium mining and associated activities installations.

<b>RECOMMENDATIONS</b>	
<i>R33</i>	<b><u>Recommendation:</u></b> Develop special regulations with the requirements to decommissioning uranium mining and associated activities installations.
<i>R34</i>	<b><u>Recommendation:</u></b> Require a decommissioning programme to the existing uranium mining activities.

## 15. Remediation

### *WS-R-3*

There is no appropriate existing or planned national regulations for remediation of past practices and activities.

The existence of uranium mining and production industries in Namibia could imply the need of remediation activities, for those sites which were operated without a regulatory framework for radiation protection of the environment.

CONCLUSIONS	
	<b>BASIS:</b> WS-R-3
<i>C34</i>	<b><u>Conclusion:</u></b> There could be a necessity of remediation programmes in Namibia for areas of uranium mining and associated activities which, because of the lack of appropriated national regulations, could have gone through an inadequate radiological control for the protection of the environment. However, it is important to remark that these activities have been conducted under the regulatory framework of the Ministry of Energy and Mines. This framework includes requirements for safety and protection of the environment related to the conventional hazards which also has a good impact in the radiological area. Nevertheless, the radiological situation needs special consideration.

RECOMMENDATIONS	
<i>R35</i>	<b><u>Recommendation:</u></b> Develop special regulations with the requirements to remediation programmes for uranium mining and associated activities.
<i>R36</i>	<b><u>Recommendation:</u></b> Establish a campaign to identify sites needing remediation, in order to screen the radiological situation and remediate those sites where mitigation actions are needed. The remediation programmes should be based in safety assessments, licensed by the regulatory body and inspected during their implementation. The IAEA can provide assistance in this area, subject to the formal petition by the Government and availability of financial resources.



**APPENDIX I – LIST OF PARTICIPANTS**

<b>INTERNATIONAL EXPERTS</b>		
Mr Ibrahim Shaddad	Sudan Atomic Energy Commission (SAEC)	Team Leader
Mr. Rustem Paci	Radiation Protection Commission of Albania	Reviewer on the safety of radiation sources
<b>IAEA STAFF MEMBERS</b>		
Mr Karol Skornik	NSRW	Team Coordinator
Mr Diego Telleria	NSRW	Reviewer on public exposure control
Mr Mauri Riihonen	NSNS	Reviewer on the security of radioactive sources
<b>OFFICIAL LIAISON OFFICER</b>		
Mr Axel Tibinyane	National Radiation Protection Services, Ministry of Health and Social Services	Head and National Liaison Assistant
<b>REPRESENTATIVES OF NAMIBIA</b>		
Mr. Kahijoro Kahuure	Ministry of Health and Social Services	Permanent Secretary and National Liaison Officer
Mr. Joseph Iita	Ministry of Mines and Energy	Permanent Secretary
Dr Norbert Forster	Ministry of Health and Social Services	Deputy Permanent Secretary
Ms Magdalena Nghatanga	Ministry of Health and Social Services	Director: Primary Health Care
Ms Helena Itamba	Ministry of Mines and Energy	Deputy Director: Control Minerals
Mr Gideon Amakali	National Radiation Protection Service	Inspector
Mrs Esther Embumbulu	National Radiation Protection Service	Inspector
Vera Uushona	National Radiation Protection Service	Inspector

## APPENDIX II – MISSION PROGRAMME

Date/time	Programme	Participants
<b>7 Apr. Day 1</b>		
09:00–10.00	Entrance meeting with senior officials of the bodies having a regulatory role in Namibia	Full IRRS Team Senior management, Ministry of Health and Social Services, Ministry of Mines and Energy, NPRS staff
10.00–11.00	Review of IRRS programme and terms of reference	Full IRRS Team and country representatives having a regulatory role
11.00 – 13.00	Discussions on the status of the national regulatory infrastructure component 1 – <b>‘Legislative and Statutory Framework’</b> <ul style="list-style-type: none"> <li>• Legislation.</li> <li>• Regulations and guidance.</li> <li>• Regulatory body establishment and independence.</li> <li>• Regulatory body staffing and training.</li> <li>• Regulatory body funding.</li> <li>• Co-ordination and co-operation at the national level.</li> <li>• International co-operation.</li> </ul>	Full IRRS Team and relevant country representatives having a regulatory role
13:00 – 14:00	Lunch	
14:00 – 17:00	Continued discussions on the status of the national regulatory infrastructure component 1 – ‘Legislative and Statutory Framework’	Full IRRS Team and relevant country representatives having a regulatory role
18.00–23.00	Preparation of findings and drafting of IRRS report	IRRS Team

<b>8 APR. Day 2.</b>		
09.00–13.00	Continued discussions on the status of the national regulatory infrastructure component 1 – ‘Legislative and Statutory Framework’ and component 2 – ‘Activities of the Regulatory Body’	Full IRRS Team and relevant country representatives having a regulatory role.
13.00–14.00	Lunch	
14.00–17.00	Continued discussions on the status of the national regulatory infrastructure component 1 – ‘Legislative and Statutory Framework’ and component 2 – ‘ <b>Activities of the Regulatory Body</b> ’ <ul style="list-style-type: none"> <li>• Notification and national register of radiation sources.</li> <li>• Authorization</li> <li>• Safety and security of radioactive sources</li> <li>• Inspection</li> <li>• Enforcement.</li> <li>• Information management.</li> <li>• Quality management</li> </ul>	Full IRRS Team and relevant country representatives having a regulatory role.
17.00–23.00	Preparation of findings and drafting of IRRS report	IRRS Team

<b>9 April Day 3</b>		
09.00–13.00	IRRS Team observation of simultaneous regulatory inspections of medical facilities (diagnostic imaging, radiation therapy and nuclear medicine) and industrial facilities (e.g. well-logging, NDT etc).	IRRS Team members working in smaller groups or as individuals, country representatives having a regulatory role and competent staff of medical and industrial facilities.
13.00–14.00	Lunch	
14.00-17.00	IRRS Team observation of simultaneous regulatory inspections of medical facilities (diagnostic imaging, radiation therapy and nuclear medicine) and industrial facilities (e.g. well-logging, NDT etc).	IRRS Team members working in smaller groups or as individuals, country representatives having a regulatory role and competent staff of medical and industrial facilities.
09.00–13.00	If required, one member of IRRS Team working at HQ with relevant regulatory staff to clarify issues arising from discussions and to begin preparation of preliminary draft report.	IRRS Team member and relevant country representatives having a regulatory role
14.00-17.00	Some IRRS Team members to finalise discussions on the status of the national regulatory infrastructure component 2 – ‘Activities of the Regulatory Body’	Members of the IRRS Team and relevant country representatives having a regulatory role
17.00-23.00	Preparation of preliminary draft report	IRRS Team

<b>10 April DAY 4</b>		
9.00–13.00	Preparation of findings and drafting of IRRS preliminary draft report at the regulator’s HQ	Full IRRS Team, and if required, members of the Radiation Protection Board & Inspectorate.
13.00–14.00	Lunch	
14.30–17.00	Final drafting of IRRS preliminary draft report (at HQ) – Preliminary draft made available to the regulator for overnight review.	Full IRRS Team
17.00–23.00	Preparation of preliminary draft report	Full IRRS Team
<b>11 April DAY 5</b>		
09.00–13.00	Exit meetings Summary of findings and recommendations, action plan	Full IRRS Team Senior management, Ministry of Health and Social Services, Ministry of Mines and Energy, NPRS staff.
13.00–14.00	Lunch and depart	

## APPENDIX III – SITE VISITS

### Visits of the IRRS Team to the Windhoek Central Hospital and to Namibian Road Authority on 9 April 2008. Windhoek, Namibia.

The IRRS team members participating in the NRPS announced inspections as observers were:

1-Mr.Ibrahim Shaddad

2-Mr.Diego Telleria

3-Mr.Rustem Paci

The IRRS group observed inspections at the following facilities:

Facility Inspected	Licence	Type of Practice
Windhoek Central Hospital	License issued in 2006 Duration of licence - 2 years	Diagnostic radiology(X-ray radiography unit)
Namibian Roads Authority	License issued in 2006 Duration of licence - 1 year	Industrial applications (gauges for moisture and density measurements)

The NRPS inspectors were:

1-Ms Vera Uushona

2-Ms Esther Embumbulu

3-Ms Conrad Abrahams

4-Ms Gideon Amakali

The inspections were planned in accordance with the National Guidelines for Preparing Regulatory Inspections.

The objectives of the inspections were to verify the compliance with the licence conditions and the draft regulations.

Before the inspections, the NRPS inspectors prepared the documentation, files and equipment necessary for their duties.

## 1. Windhoek Central Hospital– **Windhoek, Namibia**

An initial introductory briefing was held with the RPO. The objectives and scope of the inspection were discussed.

The inspectors proceeded using a check list for the given practice.

In the presence of the RPO, the inspectors started checking technical features of the X-Ray Machine, in accordance with QC forms, like Kvp accuracy, beam alignment etc.

The inspectors also checked relevant records like: local rules, qualification of personnel dose records of operators and exchange rate of personal dosimeters. Design safety features of the X-ray room have been checked.

The inspectors took note of deficiencies such as the lack of radiation warning signs, malfunction of red light showing the ‘beam on’ condition.

During an interview and exit briefing with the RPO, the inspectors were able to complete all the elements of the inspection check list.

Inspectors presented preliminary result of the inspection. They highlighted the identified deficiencies.

The IRRS team observed the following:

- The inspectors showed good professional skills in performing the inspection
- the ‘fair but firm’ approach to the operator was maintained throughout the inspection, The inspectors demonstrated confidence and professional attitude while inquiring of technical and safety issues.

Some elements of the inspection, such as the way of checking workers’ dose records and verifying the application of the ALARA principle could be improved

## 2. **Namibia Roads Authority:**

- At the beginning the inspectors had a brief discussion on the objective of inspection with a technician of NRA, authorized by his management to represent the operator. The technician acted as RPO. The following inspectors’ action was observed by the IRRS team:
- the inspectors checked local inventory of radioactive sources, checking also their physical presence, as well as safety and security measures of the storage place. The sources were nuclear gauges including Cs-137 and Am-Be.
- they also compared the register of the inventory of sources within the NRA and that in the files of NRPS.
- thanks to an updated registry of the NRPS, the inspectors discovered that one source was exported without proper notification. This was to be reported to the NRPS for further action.
- the inspectors verified operator’s measurements of dose rates inside the storage place,
- they also verified dose rate outside the storage place; in a room for workers who were not categorised as those occupationally exposed.
- the inspectors conducted a leak test to verify written information received showing that there was no surface contamination.
- local radiation protection rules were checked,

- during the interview with the acting RPO, inspectors went through the check list taking notes of information received,
- the inspectors took note of the safety and security procedures for transport of radioactive gauges .

The IRRS team observed the following:

- the inspectors maintained ‘firm but fair relationship with the licensee; they demonstrated a professional attitude while inquiring of technical and safety issues.
- the inspectors showed adequate skills in running the leak test, however the need of more practical experience was noted,
- some security-related aspects during transport of radioactive sources may need revision in accordance with IAEA relevant regulations.
- documentation on the movement of sources was checked.

**Conclusions:**

The NRPS inspectors showed good professional skills in the preparation for and the conduct of inspections. The check lists for both inspections were followed. The inspectors also demonstrated good level of professionalism in their attitude to and interaction with the licensees. Given the fact that some of the inspectors had relatively short working experience, continuing training is a key factor in developing their skills for conducting inspections. It was observed that the absence of enacted Law 2005 and Regulations 2006, could adversely affect both the conduct of inspections and the related follow-up action.



#### APPENDIX IV – MISSION COUNTERPARTS

Item	Subject Area	IRRS Experts	NRPSs
1.	Legislative and governmental responsibilities	<b>Items 1-8:</b> Mr Ibrahim Shaddad Mr Karol Skornik Mr Rustem Paci  Mr Mauri Riihonen	<b>Items 1-8:</b> Mr Kahijoro Kahuure Mr Joseph Iita Dr Norbert Forster Ms Magdalena Nghatanga Mrs Esther Embumbulu Vera Uushona
2.	Responsibilities and Functions of the Regulatory Body		
3.	Organization of the regulatory body		
4.	Activities of the Regulatory Body		
5.	Management System for the Regulatory Body		
6.	Policy Issues		
7.	Public Information		
8.	Safety of Radioactive Sources		
9.	Security of Radioactive Sources		
10.	Public Exposure Control, with emphasis on safety in mining operations and managing of radioactive waste	Mr Diego Telleria	Ms Helena Itamba Mr Gideon Amakali

**REVIEWERS AND CONTRIBUTORS**



## APPENDIX V – RECOMMENDATIONS AND SUGGESTIONS

	<b>Areas</b>	<b>IAEA Comment No <i>R: Recommendation, S: Suggestion</i></b>	<b>IAEA Recommendation or Suggestion</b>
A	Legislative and Governmental Responsibilities	<i>R1</i>	The Atomic Energy and Radiation Protection Act, 2005 should be implemented in its entirety as soon as possible.
		<i>R2</i>	Draft Regulations 2006 should be finalized with due consideration of outstanding issues such as security, the incorporation of the Code of Conduct and its Guidance on Import and Export of Radioactive Sources, safety in mining and milling operations as well as quality and information management.
		<i>R3</i>	Effective independence of the regulatory body including its funding should be ensured, in line with the provisions of Act No.5 of 2005. (Chapter 5).
		<i>R4</i>	In the ongoing process of preparing legislative framework for nuclear power programme, due consideration be given to the existing Act 2005, in line with the recommendation R1.
B	Responsibilities and Functions of the Regulatory Body	<i>R5</i>	In line with the Recommendation <i>R1</i> , the NRPS should follow the spirit and the letter of the Act No. 5 of 2005, pending the implementation of the Act and the establishment of the NRPA. It is further recommended that the highest priority be assigned to initiating the authorization process. The NRPS, in expectation that the Act will be implemented and the NRPA will be established as soon as possible, should adopt a graded approach, in due consideration of risks associated with regulated practices and categorisation of radioactive sources.

	<b>Areas</b>	<b>IAEA Comment No R: Recommendation, S: Suggestion</b>	<b>IAEA Recommendation or Suggestion</b>
		<i>S1</i>	While noting that the provision of individual monitoring services by the NRPS is not the responsibility of the Regulatory Authority, it is accepted that the current situation is dictated by prevailing conditions in the country. It is suggested, however, that, in the future, due consideration be given to assigning the responsibility for rendering these services to another body (e.g. Namibia Bureau of Standards, NBS) which would be certified by the NRPA when it has been established.
C	Organization of the Regulatory Body	<i>R6</i>	In the implementation of the Act No. 5 of 2005, the NRPA should be given a genuine status of an effectively independent regulatory authority, separated from the Ministry of Health and Social Services or any other national agency having promotional role in the application of nuclear or radiation-based technology.
		<i>R7</i>	Government efforts should be expedited with a view to ensuring the establishment, as soon as possible, of the NRPA, with the appointment of competent staff.
D	Activities of the Regulatory Body	<i>R8</i>	The system of notification should be introduced as soon as possible, in accordance with provisions of the Act No. 5 of 2005.
		<i>R9</i>	As an important means of introducing the system, it is recommended that the relevant requirements of the Act 2005 be made publicly known through appropriate media (press, TV, Internet).
		<i>R10</i>	Written procedures related to the authorisation process should be prepared as a matter of high priority.

	<b>Areas</b>	<b>IAEA Comment No R: Recommendation, S: Suggestion</b>	<b>IAEA Recommendation or Suggestion</b>
		<i>R11</i>	In accordance with Act 2005 (Art 21), written procedures for all stages of regulatory inspection process should be established on a priority basis.  This applies in particular to time frames for the - preparation of inspection reports, - communication of inspection results and - follow-up corrective actions
		<i>R12</i>	The programme for regulatory inspections should include unannounced inspections.
		<i>R13</i>	Written procedures related to enforcement actions should be prepared. Such procedures should be compliant with the provisions of the Act 2005 which is still to be implemented in its entirety.
E	Safety of Radioactive Sources	<i>R14</i>	The Government may wish to declare its support to the <i>Code of Conduct</i> and Guidance on the Import and Export of Radioactive Sources. Furthermore, requirements and practice-specific procedures for ensuring safety and security of radiation sources should be established and implemented, with due consideration of the categorization of sources.
		<i>R15</i>	Provisions of the <i>Code of Conduct on the Safety and Security of Radioactive Sources</i> and its <i>Guidance on the Import and Export of Radioactive Sources</i> should be incorporated into the national legislation.
		<i>R16</i>	Requirements and practice-specific procedures for ensuring safety and security of radiation sources should be established and implemented, with due consideration of the categorization of sources.
		<i>R17</i>	A centralised repository or temporary storage facility for disused and/or recovered radioactive sources should be established.

	<b>Areas</b>	<b>IAEA Comment No R: Recommendation, S: Suggestion</b>	<b>IAEA Recommendation or Suggestion</b>
F	Quality Management	<i>R18</i>	The quality management system should be gradually introduced, following the implementation of the Act 2005. It is further recommended that the self-assessment tools, developed by the IAEA, be used in the process.
G	Information Management	<i>R19</i>	The setting up of regulatory body information management system should be assigned high priority in the establishment of the NRPA (implementation of the Act 2005). Elements of such a system should be incorporated into the present regulatory framework. This applies in particular to the protection of safety and security related sensitive information and the protection of IT systems and data bases.
H	Regulatory Framework for the Control of Public Exposure Non-Associated with Radioactive Waste Management or Decommissioning	<i>R20</i>	The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the protection of the population and the environment.
I	Control of Discharges	<i>R20</i>	The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for control of discharges of radioactive material to the environment.
J	Environmental monitoring associated with authorized practices for public radiation protection purposes	<i>R21</i>	The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the environmental monitoring to ensure compliance with the requirements regarding public exposure control.

	<b>Areas</b>	<b>IAEA Comment No R: Recommendation, S: Suggestion</b>	<b>IAEA Recommendation or Suggestion</b>
K	Control of foodstuffs and selected commodities	<i>R22</i>	Evaluate the national capabilities for doing foodstuff and commodities control within the regulatory body or in other national institute (e.g.: University of Namibia). Make provisions to obtain the necessary equipment (e.g.: simple reliable gamma spectrometry systems) and/or the necessary arrangements with the University of Namibia to facilitate the cooperation in this issue. Investigate potential impact of uranium mining activities (See Annex IX)
L	Control of chronic exposures (radon, NORM and past practices)	<i>R23</i>	Include in the revision of the Draft regulation 2006 considerations for the NORM from the uranium mining activities.
		<i>R24</i>	Establish urgently a national programme to characterize and consequently control the radiological impact of NORM from uranium mining. Make provisions to obtain the necessary training and measurement equipments. (Note: The necessary training and provision of equipment could be obtained through formal agreements with the IAEA Technical Cooperation Programme).
M	Control of radioactivity in materials for recycling	<i>R25</i>	Attention should be paid to potential scenarios which could involve presence of radioactive orphan sources capable to appear in the recycling activities and impact on workers, public and environment (e.g., importation or transport of large quantities of scrap metal materials, Etc)
N	National Waste Management Policy and Strategy	<i>R26</i>	Prepare a national policy and strategy regarding waste management taking into account those elements found in the Draft Regulation 2006 and adding the necessary components. There should be provisions for ensuring that the State have a minimal capacity for storage of radioactive waste which, for any reason, may not be under control of an operator. The IAEA has a TC Regional Project RAF9037 which includes Namibia as one of the member states and it

	<b>Areas</b>	<b>IAEA Comment No R: Recommendation, S: Suggestion</b>	<b>IAEA Recommendation or Suggestion</b>
O	National Waste Management and Decommissioning Legislative and Regulatory Framework	<i>R27</i>	The government of Namibia must urgently establish a legal requirement based on an assessment of the national situation regarding uranium mining wastes and the experience at the international level to ensure financial resources to deal with the decommissioning and radioactive waste management, particularly for uranium mining related activities.
P	General Safety Provisions for Radioactive Waste and Decommissioning	<i>R28</i>	The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the safe waste management during the operation and during the decommissioning.
Q	Predisposal Management of Radioactive Waste	<i>R29</i>	The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the safe waste management including predisposal activities (and with particular attention to uranium industry wastes). The resulting regulatory requirements should consider aspects mentioned under topic 10.
R	Clearance Regime for Radioactive Waste	<i>R30</i>	The Government of Namibia must urgently implement the Act 2005 and use the revised Draft regulations as the basis for the definition of an appropriate regulatory framework for the safe waste management including clearance of materials from the regulatory control, including uranium industry wastes.
S	Storage of Radioactive Waste	<i>R31</i>	Assess the necessity of some minimal storage facility under the control of the states or appropriate formal arrangements with users with own storage capabilities and with capacity to receive temporally orphan sources recovered by the state. Seek assistance within IAEA Technical Cooperation Projects in order to define and implement a minimal storage capacity under State control.



	<b>Areas</b>	<b>IAEA Comment No R: Recommendation, S: Suggestion</b>	<b>IAEA Recommendation or Suggestion</b>
		<i>R32</i>	Give attention to uranium mining and related activities radioactive waste (See Annex IX).
T	Disposal of Radioactive Waste	-	See Annex IX
U	Decommissioning Facilities Containing Radioactive Materials	<i>R33</i>	Develop special regulations with the requirements to decommissioning uranium mining and associated activities installations.
		<i>R34</i>	Require a decommissioning programme to the existing uranium mining activities.
V	Remediation	<i>R35</i>	Develop special regulations with the requirements to remediation programmes for uranium mining and associated activities.
W		<i>R36</i>	Establish a campaign to identify sites needing remediation, in order to screen the radiological situation and remediate those sites where mitigation actions are needed. The remediation programmes should be based in safety assessments, licensed by the regulatory body and inspected during their implementation. The IAEA can provide assistance in this area, subject to the formal petition by the Government and availability of financial resources.



## **APPENDIX VI – REFERENCE MATERIAL PROVIDED BY NRPS**

1. Atomic Energy Act No. 5 of May 2005,
2. Draft Regulations on Atomic Energy Radiation Protection, 2006,
3. Detailed Functions and Tasks of the National Radiation Protection Authority
4. Staffing Plan of the NRPA,
5. NRPS Annual Report, 2006,
6. National Committee on Nuclear Security; Terms of Reference, 2006,
7. International Agreements between GOV-NAM and IAEA,
8. NRPS Applications for authorization – forms for different practices,
9. Premises Registration (License) for electronic products, re: Hazardous Substances Ordinance 1974,
10. NRPS Investigation Form; Occupational External Exposure,
11. NRPS Application for Authorization: Import /Export of Radioactive Material,
12. Guidelines for Preparing for and Inspection, NRPS,
13. Radiation Worker Registration Form, NRPS,
14. Response Sheets, NRPS,
15. Inspection Sheets for different practices,
16. Authorization Programme 2006,
17. Organizational Structure, NRPA, 2008.
18. Dose limits, NRPS,
19. List of authorizations and inspections: March 2007-March 2008.

## APPENDIX VII – IAEA REFERENCE MATERIAL USED FOR THE REVIEW

- [1] INTERNATIONAL ATOMIC ENERGY AGENCY International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. Safety Series 115, IAEA (1996)
- [2] INTERNATIONAL ATOMIC ENERGY AGENCY Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety. Safety Standards Series No. GS-R-1, IAEA (2000)
- [3] INTERNATIONAL ATOMIC ENERGY AGENCY Code of Conduct on the Safety and Security of Radioactive Sources. IAEA/CODEOC/2004
- [4] INTERNATIONAL ATOMIC ENERGY AGENCY Independence In Regulatory Decision Making International Nuclear Safety Advisory Group (INSAG) Report 17, IAEA (2003)
- [5] INTERNATIONAL ATOMIC ENERGY AGENCY Regulatory Control of Radiation Sources GS-G-1.5, 2004
- [6] INTERNATIONAL ATOMIC ENERGY AGENCY Categorization of Radioactive Sources RS-G-1.9, 2005
- [7] INTERNATIONAL ATOMIC ENERGY AGENCY Legislation and Establishment of A Regulatory Authority for the Control Of Radiation Sources (draft)
- [8] INTERNATIONAL ATOMIC ENERGY AGENCY Application of the International Radiation Safety Standards in Nuclear Medicine, Safety Reports Series No. 40 (2005)
- [9] INTERNATIONAL ATOMIC ENERGY AGENCY Application of the International Radiation Safety Standards in Radiotherapy , Safety Reports Series No. 38 (2006)
- [10] NTERNATIONAL ATOMIC ENERGY AGENCY Application of the International Radiation Safety Standards in Diagnostic Radiology and Interventional Procedures using X-Rays, Safety Reports Series No. 39 (2006)
- [11] INTERNATIONAL ATOMIC ENERGY AGENCY Application of the International Radiation Safety Standards in Industrial Radiography and Industrial Irradiators (draft)
- [12] INTERNATIONAL ATOMIC ENERGY AGENCY Building Competence in Radiation Protection and the Safe Use of Radiation Sources, RS-G-1.4
- [13] INTERNATIONAL ATOMIC ENERGY AGENCY. Safety Report No 20: Training in Radiation Protection and the Safe Use of Radiation Sources
- [14] INTERNATIONAL ATOMIC ENERGY AGENCY TECDOC 1525 Notification and Authorization for the use of radiation sources
- [15] INTERNATIONAL ATOMIC ENERGY AGENCY TECDOC 1526 Inspection of Radiation Sources and regulatory enforcement
- [16] INTERNATIONAL ATOMIC ENERGY AGENCY Guidance on the Import and Export of Radioactive Sources. IAEA/GIERS/2005
- [17] INTERNATIONAL ATOMIC ENERGY AGENCY Quality Assurance within Regulatory Bodies. IAEA-TECDOC-1090 (1999).
- [18] NTERNATIONAL ORGANIZATION FOR STANDARDIZATION Quality Management Systems Fundamentals and Vocabulary. ISO 9000: 2000, Geneva (2000).
- [19] INTERNATIONAL ATOMIC ENERGY AGENCY TECDOC-1355 Security of Radioactive Sources (2003)

- [20] INTERNATIONAL ATOMIC ENERGY AGENCY TECDOC 1388, Strengthening Control over Radioactive Sources in Authorized Use and Regaining Control of Orphan Sources. IAEA, Vienna (2004).
- [21] INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, Safety Series No. GS-R-2, IAEA Vienna (2002).
- [22] INTERNATIONAL ATOMIC ENERGY AGENCY, Regulations for the Safe Transport of Radioactive Materials, Safety Series No. TS-R-1, IAEA, Vienna (2000)
- [23] INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Radioactive Waste, including Decommissioning, Safety Standard Series No. WS-R-2, Vienna (2000).
- [24] INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Radioactive Waste. Draft Safety Requirement (DS353) IAEA (2006).
- [25] INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radioactive Discharges to the Environment, Safety Standards Series No. WS-G-2.3, IAEA, Vienna (2000).
- [26] INTERNATIONAL ATOMIC ENERGY AGENCY, Environmental and Sources Monitoring for Purposes of Radiation Protection. Safety Guide No. RS-G-1.8, IAEA, Vienna (2005).
- [27] INTERNATIONAL ATOMIC ENERGY AGENCY, Near Surface Disposal of Radioactive Waste Safety Requirements, Safety Requirements No. WS-R-1, IAEA, Vienna (1999).
- [28] INTERNATIONAL ATOMIC ENERGY AGENCY, Decommissioning of Facilities Using Radioactive Material, Safety Requirements No. WS-R-5, IAEA, Vienna, (2006).
- [29] INTERNATIONAL ATOMIC ENERGY AGENCY, Application of the Concepts of Exclusion, Exemption and Clearance. Safety Guide. Safety Standards Series No. RS-G-1.7, IAEA, Vienna (2004).
- [30] INTERNATIONAL ATOMIC ENERGY AGENCY, Remediation of Areas Contaminated by Past Activities and Accidents, Safety Requirements No. WS-R-3, IAEA, Vienna (2003).
- [31] European Foundation For Quality Management, The EFQM Excellence Model, Brussels (1999).

## **APPENDIX VIII – ACTION PLAN- NAMIBIA**

### **ELEMENTS OF THE ACTION PLAN 2008-2009**

These are two tables; the first deals with actions relating to the legislative and statutory framework and the second sets out actions specifically relating to the activities of the regulatory body.

#### **I. LEGISLATIVE and STATUTORY FRAMEWORK**

1. Legislation
2. Regulations and Guidance
3. Regulatory body establishment and independence
4. Regulatory body staffing and training
5. Regulatory body funding
6. Coordination and cooperation at national level
7. International cooperation

#### **II ACTIVITIES of the Regulatory Body**

1. Notification and national register of radiation sources
2. Authorization
3. Safety and security
4. Inspection
5. Enforcement
6. Information Management
7. Quality Management

## I. LEGISLATIVE and STATUTORY FRAMEWORK

The purpose of this action plan is to identify the fundamental tasks essential to the establishment / upgrading of a national regulatory infrastructure. It includes references to a range of IAEA and other publications. Member States should consult these publications for more detailed information.

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<b>1</b> <b>Legislation and Establishment of the Regulatory Body</b>			
<b>1.1</b> <b>Implement the Atomic Energy and Radiation Protection Act, Act No. 5 of 2005</b>	Government of the Republic of Namibia (GOV-NAM)		
<b>1.2</b> <b>Establish the National Radiation Protection Authority</b> <ul style="list-style-type: none"> <li>• Obtain approval for the organizational structure of the NRPA (action completed)</li> <li>• Appoint the members of the Atomic Energy Board</li> <li>• Appoint Director General of NRPA</li> <li>• Recruit technical and support staff for NRPA</li> </ul>	GOV-NAM		

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<b>2 Regulations and Guidance</b>			
<b>2.1 Regulations:</b> 2.1.1 Enact Regulations Relating to Radiation Protection and the Safety of Radiation Sources.	GOV-NAM		
<b>2.2 Drafting and Issuing New Regulations and Guidance Documents:</b> 2.2.1 Draft regulations on <ul style="list-style-type: none"> <li>○ Safe transport</li> <li>○ Waste management</li> <li>○ Safety and security of mining activities</li> <li>○ Other regulations according to priorities determined by AEB</li> </ul> 2.2.2 Draft guidance documents (Codes of Practice) for the implementation of the legislation and regulations. The codes of practice should cover: <ul style="list-style-type: none"> <li>● Diagnostic radiology;</li> <li>● Teletherapy;</li> <li>● Brachytherapy;</li> <li>● Nuclear medicine;</li> <li>● Industrial radiography;</li> <li>● Industrial irradiators;</li> <li>● Nuclear gauges;</li> </ul>	AEB/ NRPA	After submission of the draft Regulations and/or Guidance Documents by NRPA, the IAEA may consider the provision of expert assistance to review the drafts.	<ul style="list-style-type: none"> <li>● GS-R-1, § 5.25 – 5.28 [2]</li> <li>● CoC, § 22(m) [3]</li> <li>● Applying Radiation Safety Standards in Nuclear Medicine [8]</li> <li>● Applying Radiation Safety Standards in Radiotherapy [9]</li> <li>● Applying Radiation Safety Standards in Diagnostic Radiology and Interventional Procedures Using X Rays [10]</li> <li>● Application of the International Radiation Safety Standards in Industrial Radiography and Industrial Irradiators (draft) [11]</li> <li>● Occupational radiation protection in the mining and processing of raw materials</li> <li>● Management of radioactive waste from the mining and milling of ores</li> </ul>



TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<ul style="list-style-type: none"> <li>• Well logging;</li> <li>• Mining and milling of radioactive ores, particularly uranium.</li> </ul>			
<p><b>2.3 Issue Guidance Documents:</b></p> <p>2.3.1 Issue guidance documents.</p>	NRPA		
<b>3 Regulatory Body Staffing and Training</b>			
<p><b>3.1 Staffing:</b></p> <p>3.1.1 Develop a formal staffing plan based on the functions and responsibilities assigned by the legislation (Atomic Energy and Radiation Protection Act) and taking into account Namibia's needs based in particular on the national register of radiation sources. (This is an on-going activity).</p>	NRPA		<ul style="list-style-type: none"> <li>• GS-R-1 § 4.6 [2]</li> <li>• CoC § 21 [3]</li> <li>• Building Competence in Radiation Protection and the Safe Use of Radiation sources [12]</li> <li>• Safety Report No. 20 [13]</li> <li>• Authorization for the Possession and Use of Radiation Sources (draft). [14]</li> <li>• Inspection of Radiation Sources and Enforcement (draft) [15]</li> </ul>
<p><b>3.2 Training:</b></p> <p>3.2.1 Develop and implement a planned training programme for human resource development of the NRPA.</p>	NRPA	<p>Provision of expert services upon request.</p> <p>Provision of readily available training packages as</p>	<ul style="list-style-type: none"> <li>• GS-R-1 § 4.7 [2]</li> <li>• CoC § 10 [3]</li> </ul>

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
		<p>appropriate, dealing for example with; authorization and inspection of radiation sources in diagnostic radiology, nuclear medicine, radiotherapy, industrial radiography, gauges and well logging.</p> <p>Participation of newly recruited NRPA staff in IAEA regional training courses (upon submission of nominations of suitable candidates).</p> <p>OJT fellowships for NRPA staff (upon submission of nominations of suitable candidates)..</p>	
<b>4 Regulatory Body Funding</b>			
<p><b>4.1 Funding:</b></p> <p>4.1.1 Provide NRPA with sufficient financial resources to undertake its regulatory functions as assigned by the Atomic Energy and Radiation Protection Act.</p>	GOV-NAM		<ul style="list-style-type: none"> <li>• GS-R-1 § 2.2(4) [2]</li> <li>• CoC § 21(b) [3]</li> <li>• Reference [14]</li> <li>• Reference [15]</li> </ul>

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<b>5 National Coordination and Cooperation</b>			
<p><b>5.1 National Coordination and Cooperation:</b></p> <p>5.1.1 Develop formal cooperative and coordinating arrangements, as appropriate, with other national bodies and organizations involved in radiation safety and security e.g. Customs, Transport.</p> <p><i>Note: Coordination and cooperation can be formalized through written Memoranda of Understanding between the relevant authorities.</i></p>	AEB/NRPA/ GOV-NAM	Provision of a sample Memorandum of Understanding.	<ul style="list-style-type: none"> <li>• GS-R-1 § 3.4 [2]</li> <li>• CoC § 20(m) [3]</li> </ul>
<b>6 International Cooperation</b>			
<p><b>6.1 Bilateral and Regional Cooperation:</b></p> <p>6.1.1 Arrange for the exchange of safety and security related information, on a bilateral or regional basis, with neighbouring and/or other States as appropriate.</p> <p><b>6.2 Cooperation with International Organizations:</b></p> <p>6.2.1 Continue cooperation with the IAEA.</p> <p>6.2.2 Arrange for cooperation with other relevant intergovernmental organizations as may be appropriate.</p>	AEB / NRPA / GOV-NAM	<p>All assistance modalities available under IAEA TC and extra budgetary programmes.</p> <p>Provision of relevant documentation, international conventions, etc.</p> <p>Facilitate access to the <b>Radiation Safety Regulators Network</b> (RaSaReN Web Site)</p>	<ul style="list-style-type: none"> <li>• GS-R-1, § 4.11 [2]</li> <li>• CoC, § 12, 20(n) [3]</li> </ul>

## II. ACTIVITIES of the Regulatory Body

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<b>1 Notification and National Register of Radiation Sources</b>			
1.1.1 Establish a system of notification.	NRPA	Expert assistance, upon request, for all regulatory activities.	<ul style="list-style-type: none"> <li>• SS 115, § 2.7 – 2.8, 2.10 [1]</li> <li>• Reference [14]</li> </ul>
<p><b>1.2 Implementation of the provisions of the Code of Conduct and its Guidance on Import and Export</b></p> <p>1.2.1 The appropriate authority in Namibia should take account of the Code of Conduct on the safety and security of radioactive sources 2004 and the Guidance on the Import and Export of Radioactive Sources 2005. These require that the regulatory body of an exporting State:</p> <p>(a) obtains the consent of the corresponding regulatory body in the importing State through appropriate bilateral channels or agreements; and</p> <p>(b) issues prior notification of the intent to export a radioactive source.</p>	NRPA/ GOV-NAM	Provision of the Code of Conduct 2004 and Guidance on the Import and Export of Radioactive Sources 2005	<ul style="list-style-type: none"> <li>• CoC, § 23 – 25 and 28 [2]</li> <li>• GIERS 2005 Parts VII-IX [16]</li> <li>• RS-G-1.9 [6]</li> </ul>

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<p><b>1.3 National Register of Radiation Sources:</b></p> <p>1.3.1 Maintain the comprehensive national register of ionizing radiation sources.</p> <p>1.3.2 Develop and approve formal procedures to identify and classify sensitive information related to radioactive sources.</p> <p>1.3.3 Implement appropriate measures to protect the confidentiality of information contained in the source register (inventory), particularly in relation to radioactive sources.</p>	NRPA	IAEA training has been provided.	<ul style="list-style-type: none"> <li>• CoC, § 11, 17. Annex 1[3]</li> <li>• Reference [14]</li> <li>• Reference [6]</li> </ul>
<p><b>2 Authorization</b></p>			
<p><b>2.1 Establish a System of Authorization:</b></p> <p>2.1.1 NRPA should approve and issue formal written guidance on the format and content of documents to be submitted by the applicant in support to applications for authorization.</p> <p>2.1.2 For both initial and renewal applications, NRPA should establish and approve a formal written process and procedures by which it reviews and assesses applications submitted, taking into account the potential magnitude and nature of the radiation hazard associated with the particular facility or activity and for radioactive sources, the nature of the security risk.</p>	NRPA	Expert assistance, upon request, for all regulatory activities. Fellowships and/or scientific visits, as appropriate.	<ul style="list-style-type: none"> <li>• SS 115, § 2.7, 2.8, 2.11 – 2.14 [1]</li> <li>• GS-R-1, § 5.3 – 5.6, [2]</li> <li>• CoC, § 22(a) [3]</li> <li>• Reference [14]</li> <li>• Reference [6]</li> <li>• Reference [19]</li> </ul>
<p>2.1.3 Establish and approve formal written process and procedures to approve, amend, reject, suspend or revoke applications for authorization in accordance with the legal requirement.</p>	NRPA		<ul style="list-style-type: none"> <li>• GS.R-1 § 5.5 (1, 2) [2]</li> </ul>

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<p>2.1.4 In accordance with national legislation, if appropriate, establish and approve formal written process and procedures by which aggrieved applicants may appeal regulatory decisions.</p>	NRPA		<ul style="list-style-type: none"> <li>• GS.R-1 § 2.4 (7), [2]</li> </ul>
<p><b>2.2 Authorization of the Import and Export of Radioactive Sources:</b></p> <p>2.2.1 The appropriate authorities of Namibia should take account of the Code of Conduct on the safety and security of radioactive sources 2004 and the Guidance on the Import and Export of radioactive Sources 2005. These require that:</p> <p>The regulatory body of an exporting State should ensure that:</p> <ul style="list-style-type: none"> <li>• for export, it has notified and obtained the consent of the importing State through appropriate bilateral channels or agreements;</li> <li>• the receiving State has the appropriate technical and administrative capability, resources and regulatory structure to ensure the management of the sources in a manner consistent with the Code of Conduct and the Guidance on the Import and Export of Radioactive Sources.</li> </ul> <p>The regulatory body of the importing state:</p> <ul style="list-style-type: none"> <li>• Ensures that the recipient is authorized to receive and possess the source in accordance with the national legislation (if any) or with the relevant international</li> </ul>	NRPA / Government of Namibia / Customs and Excise Administration	Provision of training and reference material	<ul style="list-style-type: none"> <li>• CoC, § 23 – 25 and 28 [2]</li> <li>• GIERS 2005 Parts VII-IX [16].</li> <li>• Reference [14]</li> </ul>

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<p>guidance.</p> <ul style="list-style-type: none"> <li>Ensures that the appropriate regulatory framework exists.</li> </ul>			
<b>3 Safety and Security of Radioactive Sources</b>			
<p><b>3.1 Defining levels of safety and security</b></p> <p>3.1.1 Establish procedures designating different levels of safety and security based on source categorization including a graded approach to the security of Category 1-3 sources.</p> <p>3.1.2 Establish procedures and approve procedures for addressing specific situations regarding radioactive sources including:</p> <ul style="list-style-type: none"> <li>found, lost or stolen sources;</li> <li>cessation of licensed operations for economic reasons;</li> <li>handling, transport and storage of recovered orphan or vulnerable sources;</li> <li>safe and secure storage of sources at ports of entry;</li> <li>scrap metal monitoring;</li> <li>tracking the movement of high-risk sources;</li> <li>safety and security of radioactive sources routinely stored on vehicles or at field sites.</li> </ul>	NRPA	Expert assistance upon request.	<ul style="list-style-type: none"> <li>CoC, § 18, 20[3]</li> <li>CoC, § 9, 13 (b), 15, 19 (g), 22 (g)</li> <li>Reference [6]</li> <li>Reference [19]</li> </ul>

TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<b>4</b> <b>Inspection</b>			
<b>4.1    Inspection System:</b> 4.1.1    Establish the inspection programme taking into account the potential magnitude and nature of the radiation hazard associated with particular facilities or activities.	NRPA	Expert assistance upon request. OJT fellowship for candidates assuming positions as NRPA inspectors.	<ul style="list-style-type: none"> <li>• GS-R-1, § 5.14 – 5.17 [2]</li> <li>• CoC, § 20(h), 22(I), 19(h) [3]</li> <li>• Reference [15]</li> <li>• Reference [6]</li> <li>• Reference [19]</li> </ul>
4.1.2    Develop and approve formal written process and inspection procedures appropriate to the types of radiation practices regulated.	NRPA	Expert assistance upon request.	<ul style="list-style-type: none"> <li>• Reference [15]</li> </ul>
4.1.3    Establish and approve formal written protocols clearly defining the duties and responsibilities of inspectors in the conduct of inspections.	NRPA	Expert assistance upon request. Standard package of radiation monitoring equipment to the value of approx. EUR 15,000	<ul style="list-style-type: none"> <li>• Reference [15]</li> </ul>



TASKS for each ELEMENT	ACTION BY:	IAEA INPUT	REFERENCES
<b>5 Enforcement</b>			
<b>5.1 Establish a System of Enforcement:</b> 5.1.1 Establish and approve formal policy and written procedures for enforcement actions appropriate to the nature of the alleged breach including, if appropriate, any necessary cooperative arrangements with relevant law enforcement agencies (justice, police, security, etc).	NRPA (and other agencies as may be appropriate)	Expert assistance upon request.	<ul style="list-style-type: none"> <li>• GS-R-1, § 5.18 – 5.24 [2]</li> <li>• CoC, § 20 (i), 22 (j) [3]</li> <li>• Reference [15]</li> </ul>
<b>6 Information Management</b>			
<b>6.1 Information Collection and Dissemination:</b> 6.1.1 Develop and approve formal procedures for collecting and disseminating information to radiation users, professional groups having input to radiation practices and to the public where appropriate.	NRPA with the cooperation of relevant Government agencies.	Expert assistance upon request.	<ul style="list-style-type: none"> <li>• CoC, § 13 [3]</li> <li>• GS-R-1, § 3.3(6), (7), (11) [2]</li> </ul>
<b>7 Quality Management</b>			
<b>7.1 Quality Management Programme:</b> 7.1.1 Establish and approved quality management programme to ensure the NRPA programmes and procedures are reviewed at specified intervals to assure their efficiency and effectiveness.	NRPA	Expert assistance upon request.	<ul style="list-style-type: none"> <li>• GS-R-1, § 4.5 [2]</li> <li>• TECDOC-1090 [17]</li> <li>• ISO 9000 [18]</li> </ul>

## **APPENDIX IX: SUMMARY ON THE SITUATION IN URANIUM MINING AND ASSOCIATED ACTIVITIES IN NAMIBIA**

### **The regulatory framework**

Namibia has significant deposits of uranium and, associated to its commercial exploitation, large uranium reserves located in the region of Erongo.

Uranium mining, milling and processing (mineral extraction, concentration, yellow cake; U<sub>3</sub>O<sub>8</sub>) are conducted in Namibia under the framework of the Minerals (Mining and Prospecting) Act 1992.

The Office of the Mining Commissioner is responsible for the implementation of this Act and the Mines Safety and Services Division under the direction of the Chief Inspector on Mines is responsible for health and safety issues in all mines in Namibia.

The Minerals Act 1992, does not explicitly cover the radiological safety aspects, however covers for the safety and protection of installations and workers on site, and the protection of the members of the public and the environment in general.

MME is in the process of reviewing the current Minerals (Mining and Prospecting) Act, 1992 to incorporate the Mineral Rights Advisory Committee (MRAC) into the bill and also to draft and finalize the licensing regulations and any other regulations such as the Mine Health and Safety Regulations.

The Ministry of Mines and Energy is also considering development of a more comprehensive legal framework for uranium in particular and the inclusion of the safety aspects related to uranium. The introduction of the radiation safety aspects will be made consistent with the existing Atomic Energy and Radiation Protection Act 2005 and its derived regulations. For this purpose, MME is working in close connection with the Ministry of Health and Social Services.

From the conventional safety (non-radiological) point of view, the safety assessments required to receive an authorization to conduct the activities related to uranium extraction and purification, all the stages in the life of the installation must be considered in Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP).

As some conventional safety assessments bear direct or indirect relation with the degree of radiological safety to workers, public and environment, it is worth to briefly mention them:

The first step to conduct uranium related activities is to submit an application to the Office of the Mining Commissioner. The application is assessed and evaluated by the Minerals Prospecting and Mineral Rights Committee (Chaired by Permanent Secretary of MME, and members of other Government Ministries.) (The MPMRC recommends to the Minister of Mines and Energy the approval or rejection of the application.

The first assessment which requires a validation from MME prior to an authorization is the "mine plan", which covers the intended mining methods and the health and safety aspect.

MME issues three types of licenses:

- (a) Exclusive Prospecting License (valid for the period of 3 years)
- (b) Minerals Deposit Retention License
- (c) Mining Licenses (valid for a period of 25 Years)

The EIA and the Environmental Management Plan is included in this applications and this is assessed by Ministry of Environment and Tourism, in conjunction with MME.

The transportation and emergency preparedness aspects related to radioactive materials are sporadically consulted with the Ministry of Health and Social Welfare.

Once licenced, the Chief Inspector on Mines deals with health and safety of employees in/at mines across the country, to ensure that mining activities are conducted in a safe and sustainable manner, free of accidents.

MET conducts assessment and verification of environmental issues within its mandate and “upon request” avails such information to MME or any other party.

Matters pertaining to Health and Safety, in or at mines, fall within the mandate of MME and it keeps records thereof.

Currently there is a temporally moratorium on new licenses (prospecting, mining, etc) in order to have time to revise and implement a new law specific for uranium (mining, milling, transportation, exportation, etc)

The Atomic Energy and Radiation Protection Act 2005 establishes provisions in general for the regulation of the protection of the public against sources of radiation exposures and the radiological protection of the environment (and that the regulations to be issued must take due account of any guideline or standard published by the ICRP and the IAEA). However, the mentioned Act 2005 has not been implemented and no generic or specific regulations have been produced.

### **The radiological situation**

There is no specific information related to the radiological situation of workers, members of the public and the environment, however some characteristics lets do the following inferences:

The installations are located in arid regions with limited water resources and evaporation used as a way to reduce the liquid discharges, these situation leads to generally low level of aquatic discharges.

The arid climate results in problems with the dust resuspension.

As we stand there are no general concerns by the public raised again uranium mining operators however, some environmental NGOs (quoted as ‘activists’ by the authorities) have raised some concerns against uranium mining operations in Namibia but this is generally resolved through stakeholder public information gatherings on quarterly basis

The provisions of the current Minerals bill oblige mineral rights holders to put money aside (create an Environmental Trust Fund) for the rehabilitations of mines after closure.

### **Conclusions**

Uranium mining activities are conducted in Namibia under a national infrastructure for its control, including a regulatory framework and governmental supervision and enforcement capabilities. However, this framework does not provide for the radiological aspects of the protection of workers, public and the environment.

Notwithstanding that “good practices” are being conducted in Namibia the area of conventional safety related issues, which probably bear direct or indirect relation with the degree of radiological safety to workers, public and the environment, the lack of an adequate radiological safety framework (and the associated infrastructure) do not allow the government of Namibia to know the current situation and ensure the necessary protection in accordance to the international standards, recommendations and guidance.

The process of revision of the related legislation which is being conducted, if timely concluded, will provide an adequate comprehensive framework, including for the radiological protection associated to mining activities.

There exist provisions in the Atomic Energy and Radiation Protection Act 2005 that can be: (a) directly applied, (b) adopted or (c) considered at the moment of producing specific regulations for the radiological control of the uranium mining activities. The delay in the implementation of this Act is an impediment for the development and application of regulations, including those general and specific applicable for these activities.

### ***Recommendation***

The government of Namibia should, without delay, progress in the revision of the regulatory framework and the related national infrastructure to control the radiological protection of workers, members of the public and the environment in connection with the uranium mining activities.

The existing Atomic Energy and Radiation Protection Act 2005 as well as the expertise in the Ministry of Health and Social Services should be considered during the process of revision of the Minerals (Mining and Prospecting) Act 1992 and at the moment to produce the specific regulations for the radiological safety and protection of the workers, public and environment.

The Government of Namibia could seek for advice and assistance from the IAEA under the framework of existing (RAF9037) or new Technical Cooperation Projects in order to: (a) Produce preliminary guidance for the protection of workers, public and environment related to uranium mining activities; (b) Develop of an action plan for the development/improve of the national framework, from the National Policy and Strategy, the Legislation to the Regulations, and the reinforcement of the infrastructure for its implementation; and (d) Implement the resulting action plan.

## REFERENCES

### References relating to the Action Plan:

- [1] INTERNATIONAL ATOMIC ENERGY AGENCY International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. Safety Series 115, IAEA (1996)
- [2] INTERNATIONAL ATOMIC ENERGY AGENCY Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety. Safety Standards Series No. GS-R-1, IAEA (2000)
- [3] INTERNATIONAL ATOMIC ENERGY AGENCY Code of Conduct on the Safety and Security of Radioactive Sources. IAEA/CODEOC/2004
- [4] INTERNATIONAL ATOMIC ENERGY AGENCY Independence In Regulatory Decision Making International Nuclear Safety Advisory Group (INSAG) Report 17, IAEA (2003)
- [5] INTERNATIONAL ATOMIC ENERGY AGENCY Regulatory Control of Radiation Sources GS-G-1.5, 2004
- [6] INTERNATIONAL ATOMIC ENERGY AGENCY Categorization of Radioactive Sources RS-G-1.9, 2005
- [7] INTERNATIONAL ATOMIC ENERGY AGENCY Legislation and Establishment of A Regulatory Authority for the Control Of Radiation Sources (draft)
- [8] INTERNATIONAL ATOMIC ENERGY AGENCY Applying Radiation Safety Standards in Nuclear Medicine, Safety Reports Series No. 40 (2005)
- [9] INTERNATIONAL ATOMIC ENERGY AGENCY Applying Radiation Safety Standards in Radiotherapy, Safety Reports Series No. 38 (2006)
- [10] INTERNATIONAL ATOMIC ENERGY AGENCY Applying Radiation Safety Standards in Diagnostic Radiology and Interventional Procedures Using X Rays, Safety Reports Series No. 39 (2006)
- [11] INTERNATIONAL ATOMIC ENERGY AGENCY Application of the International Radiation Safety Standards in Industrial Radiography and Industrial Irradiators (draft)
- [12] INTERNATIONAL ATOMIC ENERGY AGENCY Building Competence in Radiation Protection and the Safe Use of Radiation Sources, RS-G-1.4
- [13] INTERNATIONAL ATOMIC ENERGY AGENCY. Safety Report No 20: Training in Radiation Protection and the Safe Use of Radiation Sources
- [14] INTERNATIONAL ATOMIC ENERGY AGENCY Authorization for the Possession and Use of Radiation Sources (draft)
- [15] INTERNATIONAL ATOMIC ENERGY AGENCY Inspection of Radiation Sources and Enforcement (draft)
- [16] INTERNATIONAL ATOMIC ENERGY AGENCY Guidance on the Import and Export of Radioactive Sources. IAEA/GIERS/2005
- [17] INTERNATIONAL ATOMIC ENERGY AGENCY Quality Assurance within Regulatory Bodies. IAEA-TECDOC-1090 (1999).
- [18] INTERNATIONAL ORGANIZATION FOR STANDARDIZATION Quality Management Systems Fundamentals and Vocabulary. ISO 9000: 2000, Geneva (2000).
- [19] INTERNATIONAL ATOMIC ENERGY AGENCY TECDOC-1355 Security of Radioactive Sources (2003)
- [20] INTERNATIONAL ATOMIC ENERGY AGENCY Notification and Authorization for the Possession and Use of Radiation Sources. IAEA, Vienna (Draft Safety Report).

- [21] INTERNATIONAL ATOMIC ENERGY AGENCY TECDOC 1388, Strengthening Control over Radioactive Sources in Authorized Use and Regaining Control of Orphan Sources. IAEA, Vienna (2004).
- [22] INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, Safety Series No. GS-R-2, IAEA Vienna (2002).
- [23] INTERNATIONAL ATOMIC ENERGY AGENCY, Regulations for the Safe Transport of Radioactive Materials, Safety Series No. TS-R-1, IAEA, Vienna (2000)
- [24] European Foundation for Quality Management, The EFQM Excellence Model, Brussels (1999).