ATOMIC ENERGY BOARD
OF NAMIBIA

ANNUAL REPORT
2010/2011

REPUBLIC OF NAMIBIA

ATOMIC ENERGY BOARD

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ANNUAL REPORT

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This Annual Report is submitted to the Hon Minister of Health and Social Services in accordance with the requirements stipulated in Section 15(5) of the Atomic Energy and Radiation Protection Act (Act No 5 of 2005) and covers the activities of the *Atomic Energy Board* and of the *National Radiation Protection Authority*

Objects of the Atomic Energy and Radiation Protection Act, Act No 5 of 2005.

· to minimize the exposure of persons and the environment in Namibia to the effects of harmful radiation
· to ensure that adequate control is exercised over the possession, production, processing, sale, export and import of radiation sources and nuclear material
· to create the necessary mechanisms to facilitate compliance with the obligations of Namibia under international agreements relating to nuclear energy, nuclear weapons and protection against the harmful effects of radiation.

ATOMIC ENERGY BOARD

Established pursuant to the requirements under section 3 of the Atomic Energy and Radiation Protection Act, Act No 5 of 2005

The Vision of the Board is the long-term management of Namibia's nuclear and radioactive materials in a manner that safeguards people and respects and protects the environment, now and in the future

The Mission of the Board is to ensure that through the provision of appropriate advice, the use of radiation and nuclear energy in Namibia does not cause unacceptable impact on the health of workers, members of the public and on the environment

Contents

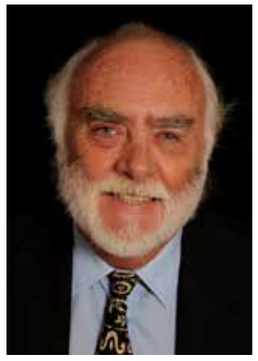
1. CHAIRPERSON'S REPORT 3
2. SECRETARY'S REPORT 4
3. INSTITUTIONAL FRAMEWORK 5
3.1 Organisational Arrangements 5
3.2 Atomic Energy Board 6
3.3 National Radiation Protection Authority 7
3.4 Members of the Board 8
3.5 Committees of the Board 9
4. NATIONAL POLICY ON NUCLEAR ENERGY 10
4.1 Regulation of Peaceful Applications of Nuclear Energy 10
4.2 Regulatory Authority 10
4.3 Promotion of Peaceful Uses of Nuclear Energy 11
5. NUCLEAR NON- PROLIFERATION, SAFEGUARDS AND VERIFICATION 12
6. PROMOTING THE PEACEFUL USES OF NUCLEAR TECHNOLOGY –
Technical Cooperation with the IAEA (OFFICE OF THE NATIONAL LIAISON OFFICER) 13
7. PROMOTING COOPERATION IN THE AREA OF NUCLEAR OR RADIATION SAFETY 14
8. REGULATORY ACTIVITIES 16
8.1 Register of Radiation Sources 16
8.2 Authorization Process 17
8.3 Safety Review and Assessment 17
8.4 Compliance Assurance 17
8.5 Guidance Documents 18
9. EXTENT OF RADIATION EXPOSURE 18
9.1 Exposure Attributable to Activities of Authorised Practices 18
9.2 Chronic Exposure 20

1. CHAIRPERSON'S REPORT

This is the Atomic Energy Board (AEB)'s second annual report on Namibia's peaceful nuclear energy program. The report follows extensive consultation conducted between the AEB members and National Radiation Protection Authority (NRPA). The AEB and the NRPA provides Namibians with assurance that the nuclear industry operates in a safe manner and that we will continue to improve health and safety initiatives and exploit the benefits which nuclear energy can provide.

This report assesses the progress of Namibia's peaceful nuclear energy program and reflects the AEB's views on the performance of the program in five fundamental areas namely: safety, security, non-proliferation, transparency and sustainability. The AEB made steady progress toward its commitment to ensure that radiation protection and nuclear safety remains our number one priority and concentrated on the rolling out of the 2005 *Atomic Energy and Radiation Protection Act*. This required a clearly documented strategy, a strategic plan and the development of criteria for assessing compliance.

During the past year, the Board undertook decisive measures to improve efficient and effective risk oversight by appointing two Special Advisory Committees to the Board. *The Nuclear Security Advisory Committee* has oversight of nuclear security related issues and is lead by Madame Martha Hitenanye whilst the *Nuclear Science Committee* is guided by Dr SC Herman. The Board has established synergetic ties with other governmental institutions in order to advance the contribution of nuclear science and technology in the fields of agriculture, human health, industry, environmental protection and other sectors.



The nuclear industry will undergo major changes during the next couple of years and Namibia is on the brink of a new era of development with far-reaching transformation of our nuclear abilities. In this changing and difficult post Fukushima era, even greater vigilance is required if the Board is to continue to provide assurance that the industry remains safe. The Board supports the Government's determination to explore the benefits and risk associated with nuclear power as a clean and sustainable source of electricity and in this regard the AEB is committed to honor its commitment to continue to make nuclear safety, non-proliferation and transparency its highest priority.

The Board wishes to express its sincerest appreciation to the Honorable Minister and to the Permanent Secretary of the Ministry of Health and Social Services for their guidance and support, as well as to the NRPA for their dedicated service. I would also like to pay tribute to my colleagues serving on the Atomic Energy Board for their high level of engagement during the year and the time and effort committed to ensuring that our top priorities have been appropriately addressed.

Sincerely,

Wotan Swiegers

2. SECRETARY'S SUMMARY

Since the establishment of the Atomic Energy Board and the National Radiation Protection Authority in 2009, the priority initiatives have been to bring about the full operationalisation of the Board's Secretariat and the Authority. There has been progress with regard to funding and equipping the organisation with the systems and process necessary for its functionality. However some challenges were experienced, particularly with regard to recruitment of staff and the shortcoming of expertise in some technical areas.

The field of radiation protection is diverse in nature and its application is found in almost all major areas of science and technology. Therefore the technical expertise of the Authority calls for an in-depth knowledge and expertise in key areas that the Authority regulates. The current expertise includes specialists in various disciplines such as physics, chemistry, radiography, and biology. There is need to broaden this expertise, especially in disciplines applicable to mining.

The current expertise in radiation protection ranges from one year to twenty years in the field of radiation protection while the qualifications range from basic undergraduate to MSc in radiation protection. While noting the excellent contribution of the staff I am hopeful that we can motivate them to specialise in radiation protection with many more pursuing studies relevant to nuclear and radiation safety at postgraduate level and thus to develop the analytical, research and teaching capabilities in this field of specialisation.

Human resources is highlighted here since this is the key resources that will cause the organisation to improve in all aspects of its mandate such as (i) supporting the Atomic Energy Board to ensure that nuclear technology makes a viable contribution to our national developmental priorities; (ii) ensuring that people and the environment are not unjustifiable exposed to radiation exposure and (iii) ensuring that Namibia contributes meaningfully to the regional and international arena in terms of influencing standards setting and meeting obligations under international agreements.

Our aim is to attain the highest standard of regulatory practices which are compliant with or compatible with international standards and best practices. By assuming and inculcating this vision the Authority is paving the way to become a competent body that is able to respond effectively to the industrialisation effort as articulated in Vision 2030.

With the current support of the management of the Ministry of Health and Social Service, the Minister and members Atomic Energy Board as well as the enthusiasm of my colleagues I am confident that we can go from strength to strength to realise our vision.

Yours truly,

Axel Tibinyane

3. INSTITUTIONAL FRAMEWORK

3.1 Organisational Arrangements

The Atomic Energy Board was established in February 2009 in accordance with the provisions of the Atomic Energy and Radiation Protection Act, Act No 5 of 2005. The Board is an advisory body meeting at least four times in a year and reporting to the Minster of Health and Social Services. The Secretary of the Board is the Director of the National Radiation Protection Authority, which is the technical arm responsible for the administration of the Act. While the Authority is administratively positioned in the Ministry of Health and Social Services, the Act empowers the Authority to act independently in the exercise of any discretion or the performance of any duty under the Act. Only the relevant provision of the Act and such scientific and technical matters as may be relevant to the issues concerned must be considered.

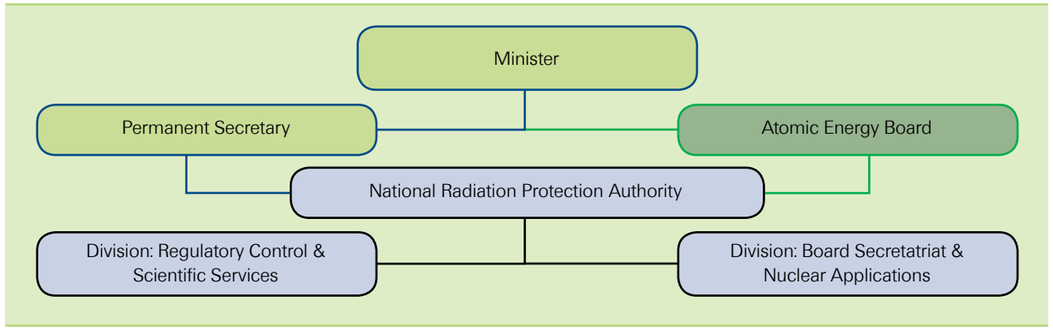
3.2 Atomic Energy Board

In accordance with the Atomic Energy and Radiation Protection Act the mandate of the Atomic Energy Board is to advise Government and any other persons or institution in Namibia on matters relating to radiation sources and nuclear energy, including amongst others, to:

1. recommend regulations and standards that must be complied with in order to ensure adequate protection of workers, patients, public and the environment against the harmful effects of radiation exposure;
2. advise the Minister on matters relating to radiation protection, radiation sources, radioactive materials, radioactive waste and prescribed non-ionising radiation sources;
3. make recommendations to relevant persons and the Government relating to the promotion of peaceful uses of atomic energy and related research on radiation safety issues;
4. advise and recommend to organs of the State how to co-ordinate emergency responses and the assistance required in the case of a radiation related emergency;
5. maintain contact for information exchange and co-operation with other bodies in Namibia, regulatory bodies of other countries and relevant international organisations in particular, with regard to treaties and conventions entered into between the Government of the Republic of Namibia and those countries and organisations, particularly on radiation or nuclear safety

3.3 Atomic Energy Board Secretariat

The Director of the National Radiation Protection Authority is the Secretary of the Board and is supported by staff members that are designated as such by the Permanent Secretary. The Division: Nuclear Applications is designated to perform the work of the Board and also to support the Office of the National Liaison of Officer (NLO).



The Secretariat provides support to the Board with respect to (i) development of policies for regulatory and promotional work relating to nuclear applications (ii) drafting of regulatory requirements and standards (iii) facilitating compliance with international legal instruments; (iv) drafting the national radiological emergency response and preparedness plan (v) establishing the framework for the development of capacity at facility level to ensure compliance with safety objectives (vi) collection and dissemination of information (vii) quality management to ensure that the regulatory infrastructure and mechanism performs against pre-defined standards

The Secretariat also supports the Office of the NLO, which is the Office the Permanent Secretary as the designated focal point of all matters relating to the technical cooperation with the International Atomic Energy Agency (IAEA). In broad terms this function entails the integration and effective utilisation of nuclear techniques in the national developmental priorities. As such it calls for dissemination of information, coordinating and advising stakeholders, formulating projects; and overall management of national and regional projects supported by the IAEA.

3.4 National Radiation Protection Authority

The National Radiation Protection Authority is established under Section 33 of the Atomic Energy and Radiation Protection Act and is charged with the administration of the Act, including to:

1. inform the Board annually about the extent of radiation exposure in Namibia
2. inspect at such intervals as may be necessary any radiation source or nuclear material in order to assess radiation safety conditions and other requirements imposed by or under the Act
3. establish and maintain a register of radioactive materials, imported into, or produced in, Namibia, and of premises licensed to install, store and use radiation sources or dispose of radioactive waste

The above functions are executed by the division National Radiation Protection Authority which consist of two sub-divisions. The Sub-division: Inspection and Authorisation is responsible for authorisations, which includes (i) review and assessment of applications; (ii) compliance assurance; and (iii) enforcement of the regulatory requirements. The Sub-division: Scientific Services is responsible for risk assessment which entails quantification and assessment of radiation exposure to patients, persons occupationally exposed to radiation and of protection of the public, including waste management, environmental monitoring, food monitoring, pollution studies, and assessment of risk due to sources of non-ionising radiation.

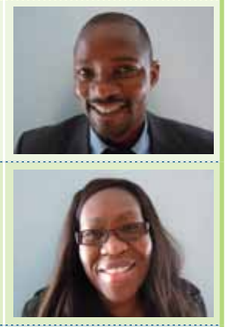
3.5 Members of the Board

The members of the Board were appointed by the Minister of Health and Social Services on recommendation from the line Ministries. Representation on the Board is from Government Ministries, including the Ministry of Mines and Energy; Health and Social Service; Labour and Social Welfare; Environment and Tourism; Foreign Affairs; and the Office of the President. The term of office is three years and comes to an end in January 2012.

Members of the Atomic Energy Board

1. **Dr. Wotan Swiegers**
   Chairperson of the Board

2. **Dr. Shitaleni Chocky Herman**
   nominated by Hon. Minister of Health and Social Services



3. **Ms. Helena Itamba**
   nominated by Hon. Minister of Mines and Energy

4. **Mr. Ileni Shikwambi**
   nominated by Hon. Minister of Labour and Social Welfare

5. **Mr. Teo Nghitila**
   nominated by Hon. Minister of Environment and Tourism

6. **Mr. Gerard Theron**
   nominated by Hon. Minister of Foreign Affairs

7. **Ms. Martha Hitenanye**
   from the Office of the President

Secretariat: Mr. Axel Tibinyane
Director: National Radiation Protection Authority

3.6 Committees of the Board

The Act empowers the Board to establish committees to enquire into and advise the Board on such matters within the scope of the functions of the board. In this respect the Board established the Nuclear Security Committee and the Scientific Committee to advise it on matters elaborated below:

3.6.1 Nuclear Security Committee

The Board recognizes that Namibia is, like any other country, vulnerable to malicious or unauthorized acts involving radioactive or nuclear material. In order to protect people against the disastrous consequences of a malicious act or accident situation it is absolutely necessary to establish a regulatory and institutional framework to ensure the security of all material. In this regard it is important to determine the security and radiological risks associated with the current inventories of radioactive and nuclear material and establish requirements, infrastructure and capabilities to prevent or respond to nuclear security threats.

Therefore the Board has commissioned the Nuclear Security committee to conduct a threat assessment and to propose requirements with which persons and facilities must comply to ensure the security of nuclear or radioactive material. Such requirements must include physical protection measures to prevent the occurrence of any malicious act; or should such act occur the committee should propose measures necessary to respond effectively to such an act. The Board has further tasked the Committee to assess the extent of potential accident scenarios which might call for a response at national level and to specify how the Board would advise relevant national institutions on the capacity and capabilities necessary to respond to the risk.

The Committee is under the leadership of Ms M Hitenanye (Board member) and deputized by Ms H Itamba (Board member) with representation from the Ministries of Mines & Energy; Foreign Affairs; Finance; Defence; Home Affairs and Immigration; Safety and Security; and Finance (Customs), Office of the President.

3.6.2 Scientific Committee

The Board takes cognizance of the concerns of the workers and the public about the health effects of human exposure to both ionizing and non-ionising radiation and their right to be adequately protected. For this reason the Board established the Scientific Committee to advise it on scientific and technical matters relating to exposure to radiation.

The current work of the Committee centres on the need for the establishment of a regulatory regime for protection against sources of non-ionising radiation such as exposure from Mobile Phone Towers. The Committee is currently consulting locally and also considering the regulatory practices applied in other countries with the view to advise on the appropriate measure to adopt for protection against sources of non-ionising radiation.

The Committee is led by Dr S C Herman (Board member), assisted by Mr I Shikwambi (Board member with representation from the Ministries of Environment and Tourism; Labour and Social Welfare; Regional and Local Government, Housing and Rural Development; and Information and Communication Technology.

4. NATIONAL POLICY ON NUCLEAR ENERGY

A core and central functions of the Board is to advice Government on matters relating to radiation sources and nuclear energy. Government approved the Radiation Protection Policy in 1994, which has given effect to the enactment of the Atomic Energy and Radiation Protection Act, Act No 5 of 2005 and subsequently the establishment of the Atomic Energy Board as well as the National Radiation Protection Authority. However successive developments justify a revision of the current policy, especially in the context of the on-going initiatives lead by the Ministry of Mines and Energy to develop a Nuclear Fuel Cycle Policy. The Board in its advisory capacity has made a submission toward the development of the Nuclear Fuel Cycle Policy, and include amongst others the following key themes to be considered in the policy.

4.1 Regulation of Peaceful Applications of Nuclear Energy

The Board opines that the Atomic Energy and Radiation Protection Act is comprehensive and sufficient to regulate matters relating to radiation sources, radioactive material, and nuclear material and to ensure that Namibia meets it obligations under the existing international legal instruments relating to nuclear safety, radiation safety and nuclear weapons. In view of the aspirations to explore the options for embarking upon a nuclear power programme the Board advices that the Atomic Energy and Radiation Protection Act be amended to include regulation of nuclear installations such as a nuclear power plant; nuclear fuel fabrication plant; enrichment plant; or spent fuel storage facility.

4.2 Regulatory Authority

The National Radiation Protection Authority (NRPA) was established to administer the Atomic Energy and Radiation Protection Act and thus mandated to regulate activities related to radiation sources, radioactive and nuclear material. In the event that the current Act is amended to include regulation of nuclear installations, then this arrangement may also call for the re-alignment of the NRPA to be responsive to the revised scope and mandate.

The Board has raised concern about the effective independence of the National Radiation Protection Authority as an important element for it to function with autonomy and authority in the exercise of its mandate. In the context of international recommendations and best practices the Board advices that Government considers the creation of an effectively independent Regulatory Authority, which might also call for an amendment to the current Act to create a juristic person. However such amendment should be done concurrently with the amendment to include regulation of nuclear installation. The Ministry of Health and Social Services in principle supports the effective independence of the Regulator and will propose so in the context of the national policy on the nuclear fuel cycle, which is expected to pronounce itself on these matters.

4.3 Promotion of Peaceful Uses of Nuclear Energy

Nuclear Energy applications have the potential to make meaningful contribution to the achievement of a number of priority areas identified in Vision 2030 and the National Developmental Plans. The Board opines that there should be a deliberate national drive that will harness and exploit the peaceful and beneficial uses of nuclear energy. In this respects the Board advocates for the enactment of a legislation and commitment of resources for the initiation and building of the pillars that will drive the efforts for the promotion of peaceful applications of nuclear energy. This may include the creation of a State entity mandated primarily with the function to enhance the peacefully applications of nuclear energy. The scope of such an organization may include such matters as research, development, training, education, nuclear fuel cycle activities; and non-nuclear fuel cycle activities such as those in health, agriculture and other industries.

5. NUCLEAR NON- PROLIFERATION, SAFEGUARDS AND VERIFICATION

Recognizing also that one of the functions of the Board is to advise the Minister on how the obligations of the Safeguards Agreement and the Additional Protocol to the Safeguards Agreement may be implemented, the Board has the following for information:

There are four international legal instruments that promote the enhancement of the nuclear non-proliferation regime, including obligations of parties to demonstrate their commitment towards peaceful applications of nuclear energy. These instruments include the Treaty for the Non-Proliferation of Nuclear Weapons (NPT); Safeguards Agreement for the application of the NPT; the Additional Protocol to the Safeguard Agreement; and the Treaty of Pelindaba.

5.1 Treaty for the Non-Proliferation of Nuclear Weapons (NPT)

The NPT, of which Namibia is a signatory since 1992, is the centrepiece of global efforts to prevent the further spread of nuclear weapons and represents a balance of rights and obligations with regard to nuclear disarmament, non-proliferation and peaceful use.

5.2 Safeguards Agreement

Namibia ratified the Safeguards Agreement in April 1998 and in accordance with its terms, Namibia undertakes to accept safeguards on all nuclear material in all peaceful nuclear activities, within its territory, under its jurisdiction or carried out under its control anywhere for the purpose of verifying that such material is not diverted to nuclear weapons or other nuclear explosive devices. The purpose of the Safeguards Agreement is the timely detection of diversion of significant quantities of nuclear material from peaceful nuclear activities to the manufacture of nuclear weapons or of other nuclear explosive devise or for purposes unknown, and deterrence of such diversion by the risk of early detection. Pursuant to Article 33(a) of the Safeguards Agreement (INFCIRC/551) Namibia has submitted information to the IAEA on material exports from its territory for the period January 2010 to December 2010. This include source material amounting to nearly 5000 tons, which is mainly material exported from the Langer Heinrich and Rossing Uranium Mines.

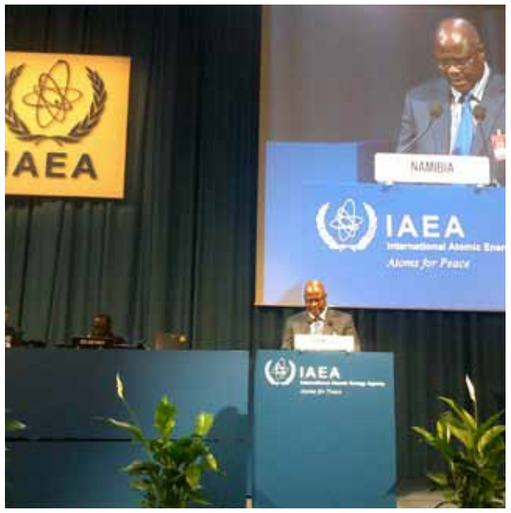
5.3 Additional Protocol to the Safeguard Agreement

As part of the IAEA's efforts to strengthen the effectiveness and improve the efficiency of the safeguards system, the Model Additional Protocol was developed to equip the system with better tools to provide assurance about both declared and possible undeclared nuclear activities. The shift in the focus of safeguards implementation is from verification of declared nuclear material at declared facilities to understanding and assessing the consistency of information on a State's nuclear programme. The Model Additional Protocol was signed in April 2000 and during this reporting period Cabinet granted approval for tabling the Protocol in the National Assembly.

5.4 Treaty of Pelindaba

The African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba) declares Africa a zone free of nuclear weapons as an important step towards the strengthening of the nuclear non-proliferation regime; the promotion of cooperation in the peaceful uses of nuclear energy; complete disarmament; and the enhancement of regional peace and security. The Treaty, which Namibia signed in April 1996, came into effect on 15 July 2009. Cabinet has also granted approval for its tabling in the National Assembly.

6. PROMOTING THE PEACEFUL USES OF NUCLEAR TECHNOLOGY - TECHNICAL COOPERATION WITH THE IAEA (OFFICE OF THE NATIONAL LIAISON OFFICER)



Namibia is party to the Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA) and to the African Regional Co-operation Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA). The two Agreements define the guiding principles and general operating rules that govern the provision of technical assistance to Namibia by the IAEA.

6.1 Country Programme Framework

The technical cooperation programme with the IAEA is described in the Country Programme Framework (CPF), which is a five year planning document, agreed between Namibia and the IAEA. It defines the role that nuclear technology can play in the overall national development plans. Priority areas are drawn from Vision 2030 and the National Development Plan. Areas such as crop production, water resource management, livestock disease, radiation therapy, nuclear medicine, energy planning, nuclear safety and security, and uranium mining amongst others, are currently included. The emphasis is on technology transfer and thus the core component of assistance received from the IAEA is mainly training; expert advice and provision of equipment.

6.2 Office of the NLO

The Permanent Secretary in the Ministry of Health and Social Services is the designated National Liaison Officer for all matters pertaining to cooperation with the IAEA and therefore plays a leading role in advancing the role of nuclear technology by engaging counterparts to realise the objectives of the CPF in the broader context of Namibia's national developmental plans. In the context of the Board's mandate to make recommendations to Government on the promotion of peaceful uses of nuclear energy, the Board's Secretariat assists the Office of the National Liaison Officer to formulate, coordinate and facilitate the implementation of the technical cooperation programme with the IAEA.

6.2.1 2009-11 Technical Cooperation Programme

During the year under review Namibia implemented five national projects covering areas such as radiation therapy, nuclear medicine, crop production, water resources management and nuclear regulatory infrastructure. Furthermore Namibia participated in twenty four regional projects covering a wide spectrum of applications of nuclear energy. The total assistance received from the IAEA during the year 2010 is about N$3.5 mil

6.2.2 2012/13 Technical Cooperation Programme

Progress is currently under way to design new national projects for implementation at the start of 2012. These projects include (i) building the teaching and research capabilities for nuclear applications at the Polytechnic of Namibia; (ii) study on the relationship between nutritional status and clinical outcomes of malaria; (iii) application of groundwater isotope techniques to conceptualize groundwater flow dynamics, recharge and quality ; (iv) mutation breeding to develop high yielding and drought resistant Pearl millet, Sorghum bicolor, Bambara groundnut and cowpea; and (v) establishment of research and diagnostic capacity for effective control of animal diseases in the northern communal areas.

7. PROMOTING COOPERATION IN THE AREA OF NUCLEAR OR RADIATION SAFETY

radiation safety

The National Radiation Protection Authority maintains contact for information exchange and co-operation with other bodies in Namibia, regulatory bodies of other countries and relevant international organizations on matters relating to nuclear and radiation safety. This is important to ensure that the Regulator is aware of and adopts best practices as well as to seek synergy with other entities which could assist in achieving the objects of the Act.

7.1 Regional Cooperation

The National Radiation Protection Authority is a member of the Forum of Nuclear Regulatory Bodies in Africa (FNRBA). The FNRBA is a regional organization comprising of nuclear regulatory bodies in Africa with its core business to provide a platform and mechanism for exchanging experiences and sharing knowledge as well as contributing to and promoting the development and harmonization of nuclear regulatory infrastructures in Africa. This Body has been operational for over two years and cooperation amongst its members include regulatory matters in areas of radiation therapy; uranium mining; nuclear power programmes; transport of radiation sources; waste management and emergency response initiatives.

7.2 Cooperation at Sub-Regional Level

At the SADC level the National Radiation Protection Authority is cooperating with SADC counterparts for the establishment of a Nuclear Regulatory Network. The SADC network is envisaged to operate under the strategic framework of the FNRBA, but with a key focus on the unique challenges faced at the sub-regional level. To this end the members are currently cooperating on regulatory matters relating to transport of radioactive material and radiological safety in uranium mines. The members have drafted a Memorandum of Cooperative Agreements with a concept paper which sets the basis for dialogue towards the establishment of a high-level formal agreement of cooperation on matters relating to nuclear and radiation safety.

7.3 Cooperation at National Level

At the national level the Authority has concluded a Memorandum of Understanding with the Customs and Excise Directorate, and the Ministry of Finance. The main purpose of the MoU is to establish rigorous import/export controls to ensure that radiation sources entering/exiting the country are released only to authorized persons and only for authorized purposes. The MoU also seeks to create awareness and empower Customs Officials on the safety and protection measures necessary, especially in the context of the on-going effort to deploy X-ray systems for scanning of cargo at border points.

8. REGULATORY ACTIVITIES

regulatory activities

8.1 Register of Radiation Sources

The scope of regulation includes practices and sources of ionizing and non-ionising radiation within practices.

The practices include activities involving radiation sources in areas of health, industry, education or research, and any activities in the nuclear fuel cycle which could involve exposure to radiation or radioactive substances.

The sources within practices include radioactive substances and devices that contain radioactive substances or produce radiation, including sealed sources, unsealed sources, radiation generators, and source material in mines and mills processing radioactive ores.

The table below presents the current inventory of practices and sources within those practices in Namibia.

Table 1: Register of Practices and Sources within Practices

Practices	No of practices	Type and quantities of sources			
		Sealed sources	Unsealed sources	Radiation generators	Source material
Dental radiography	54	-	-	80	-
Diagnostic radiography & Interventional radiology	66	-	-	145	
Radiation therapy	1	6	-	1	-
Nuclear medicine	2	9	5		
Veterinary	2	-	-	2	-
Industrial radiography	3	3	-	-	-
Nuclear gauging	12	82	-	-	-
Well logging	1	2	-	-	-
Baggage & Cargo Scanning	16	-	-	64	-
Uranium Exploration	13	-	-	-	Ore products
Uranium Mining	2	318			5 000 tons
Other Mines	4	90	-	-	-
Scanner (Occupational)	1	-	-	5	-
Educations and research	3	1	2	-	-
Transport	4	-	-	-	-
Analytical Services	3	-	-	-	Ore products

8.2 Authorization Process

The Authority has introduced stringent requirements that applicants who are engaged in activities relating to radiation sources, radioactive, or nuclear material, must comply with. Prior to granting a license applicants are required to formulate management plans which demonstrate the applicant's ability to achieve specific objectives with regard to protection of the workers, public and the environment against radiation exposure. This radiation management plan articulates the applicant's intent on how to meet regulatory requirements and how to achieve specific safety and security objectives. The key elements in the plan include organizational arrangements; pre-operational safety assessment; occupational radiation protection; public exposure control; medical exposure programme; waste management programme; safety and security of radiation sources; and emergency response and preparedness.

8.3 Safety Review and Assessment

Radiation Management Plans are reviewed to assess the risks involved with specific operations, identify the exposure pathways and the critical groups liable to the exposure; and to assess the magnitude and measures necessary to achieve a satisfactory level of protection. Specifically, the review process assesses the undertakings of the applicant against the regulatory requirements and standards, as well as establishing the scientific and technical basis for applying exposure assessment, and optimizing exposure to the workers, public and the environment. Table 2 (page 15) summarises the number of radiation management plans that came under review as part of the regulatory process and requirements.

8.4 Compliance Assurance

Compliance assurance is an integral part of the licensing regime which supports the review and assessment process. The purpose is to ensure that licensees conduct their business within the set conditions or performance parameters. The number of facilities inspected and issued with authorisations are summarised in Table 2 below.

Table 2: Register of Reviews, Inspections and Authorizations: 2010/11

	Radiation Source	Types of licenses				RMP Review	Inspections
		Import/export	Transport	Use/possession	Storage		
1	Nuclear gauges	3	5	5	5	6	5
2	Diagnostic radiology	0	0	36	0	9	45
3	Nuclear medicine	2	2	2	0	0	0
4	Industrial radiography	2	2	2	0	3	3
5	Uranium ore concentrate	2	19	0	0	2	2
6	Uranium ore	4	9	2	0	7	8
	Total	13	20	45	5	27	63

8.5 Guidance Documents

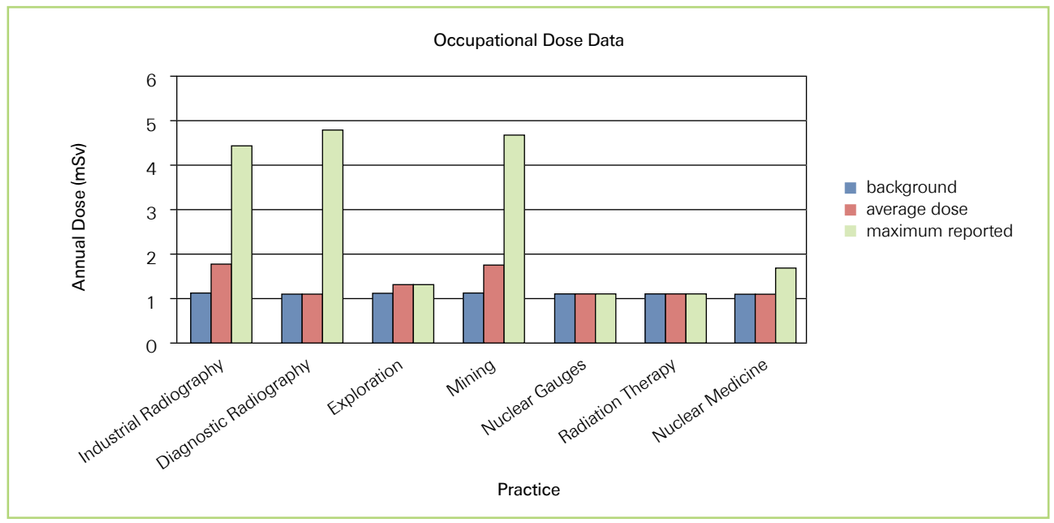
Providing regulatory guidance is also an essential part of the regulatory regime. The guidance provides licensees with a simplified understanding of the regulatory requirements and enables them to have a uniform interpretation of the requirements to ensure effective application of these for the purpose of achieving safety objectives. In this regard the Authority has issued regulatory guidance on how to formulate a Radiation Management Plan and some guidance specific to users of Nuclear Gauges to enable them to comply with safety requirements.

9. EXTENT OF RADIATION EXPOSURE

9.1 Exposure Attributable to Activities of Authorised Practices

Informing the Board about the extent of radiation exposure in Namibia is a key and central mandate of the Authority. There are different sources of radiation exposure which affect workers and the public.

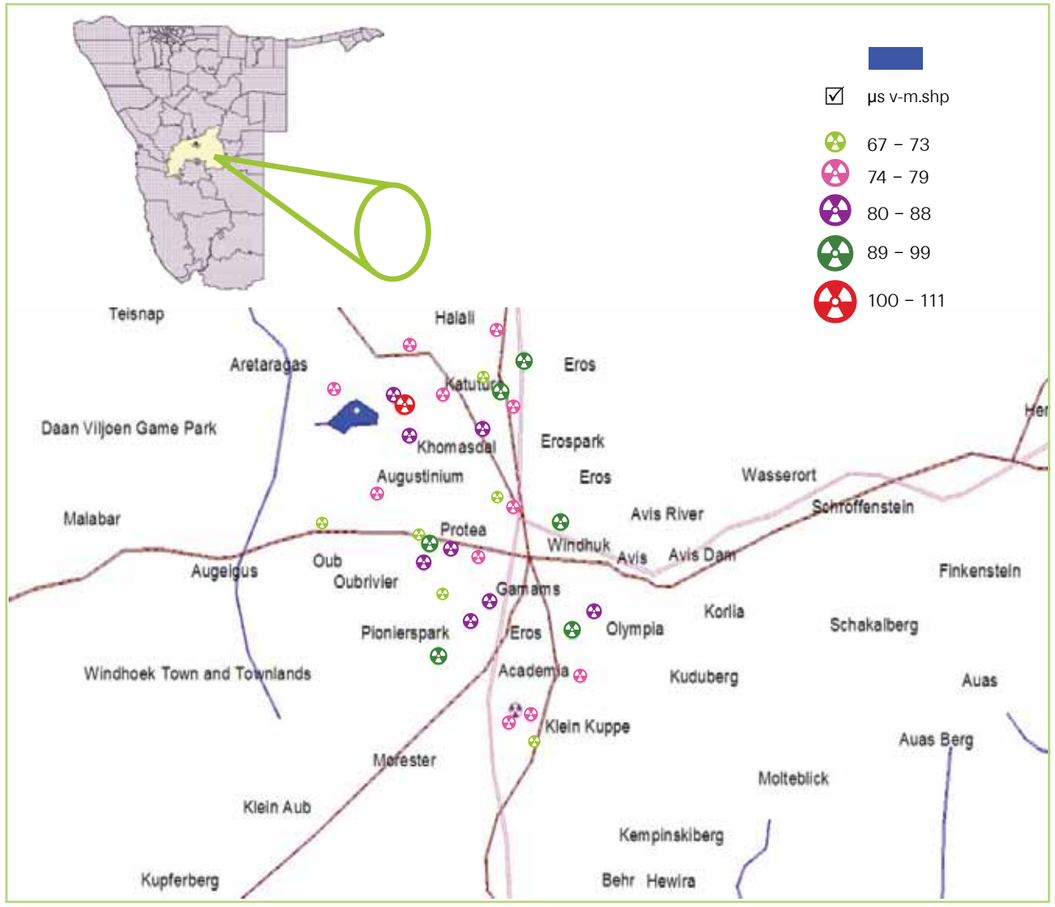
Workers and the public are liable to incur radiation exposure above normal background level due to the activities of authorised practises. Some workers are subject to routine assessment of the radiation exposure while the exposure of others workers and that of the public is determined on the basis of workplace and area monitoring. The purpose of the monitoring programme is to (i) demonstrate compliance with the regulatory limit (20mSv/a for workers and 1mSv/a for members of the public); (ii) establish baseline data and reference levels to optimise the exposure; (iii) confirm good working practices; (iv) provide information about conditions in the workplace; (v) provide information about the magnitude of potential risks as a result of exposure resulting from these practices. Figure 1 below records information about sources of radiation exposure and the average radiation exposure received by workers or the public in each of the practices.



9.2 Chronic Exposure

Natural exposures are excluded from regulation, but these need to be assessed in order to evaluate if there is any significant risk involved, or if intervention is in any case justified to protect people against perceived risk; or to advise on the land management practices. Exposures to natural sources are normally considered as chronic exposure and, if necessary, are subject to intervention. Exposure situations requiring remedial action to reduce or avert chronic exposure include (i) natural exposure, such as exposure emanating from terrestrial, cosmic and internal radiation in homes and workplaces or (ii) exposure to radioactive residue from the past.

The Authority has embarked upon a programme to establish the extent of natural exposure for the purpose of providing information on the need for action or intervention should this need be justified. This programme would cover all inhabitable areas, with the first data collection initiated in Windhoek as indicated below. The diagram shows an exposure doserate ranging from 67 – 111 uSv per month which is equivalent to 0.8-1.3 mSv per annum of exposure to natural gamma radiation and thus within acceptable levels of natural background radiation. For now these data include only exposure due to gamma radiation and does not include any data due to inhalation such as radon or ingestion of radioactivity, which will be initiated in coming years.



10. HUMAN RESOURCE DEVELOPMENT AND TRAINING

10.1 Staff of the Directorate

The qualifications and expertise of the staff of the Authority must be responsive to its mandate in order to ensure the effective administration of the Act or to enable the realisation of the Authority's vision and mission. The organisational structure is fairly new and needs systematic adaption and re-alignment as it evolves. The philosophy adopted is to ensure that all staff have a broad view of the organisation's role, but each staff member must develop in-depth expertise in the function assigned to his/her profile. In recognition of this the Directorate has supported the training of staff and participation in meetings that have been instrumental in increasing the knowledge and skills of the staff members in various sub-disciplines, which are summarised below:

Table 3: Training Programmes Offered to Staff of the Secretariat and of the Authority

Topic	Number of Staff	Duration (Weeks)
Authorization and Inspection of Radiation Sources	2	4
Regulatory Authority Information System	1	1
Nuclear Security Project coordination meeting	2	2
Radioactive Waste Management	2	2
Waste Strategy	2	1
Geographical Information Systems	1	4
Regulatory Practices for sources of Non-ionising radiation	2	1
Regulatory Practices for NORM	1	1
Regulatory Practices in Uranium Mining	1	1
Networking among nuclear regulatory bodies	1	2
Conferences on technical cooperation, nuclear and radiation safety	4	1

10.2 Capacity Building for Stakeholders

It is also imperative to equip licensees and stakeholders with the knowledge and skill to enhance safety and security provisions in facilities and in the use of radiation sources. For this reason the Authority is offering training courses to radiation safety officers in various disciplines of nuclear applications for the purpose of creating the necessary awareness and to promote a safety culture among users. The training courses offered during the year are summarized in the table below.

Table 4: Training programmes Offered to Stakeholders involved with Radiation Safety

Topic	Number of Participants	Duration (Days)
Radiography	20	1
Nuclear Gauges	23	3
Cardiac Unit	15	1
Customs Officers	28	5
Training For Police	18	1
Uranium Mining	23	1
Dental Radiography	30	1
Nuclear Security	4	1

11. MONITORING AND EVALUATION

The Board and the Authority aspires to steer the regulatory framework and the activities of the Regulator towards compliance with international standards and best practise. For this reason the IAEA recommendations and standards are used as a yard-stick against which the local framework is continuously assessed. To this end the Board's Secretariat employs an electronic tool to evaluate the regulatory infrastructure and the status of compliance, which is expected to be performed bi-annually. The report of the current self-assessment is expected to be finalised by the end of the next implementation year.

With regard to the monitoring of the implementation of the technical cooperation programme, the average project implementation rate serves as a tool against which the performance is rated. The average project implementation rate in the reporting period improved from 60% to 64% and the corresponding assistance received, improved from N$2.9 mil to N$3.5 mil.

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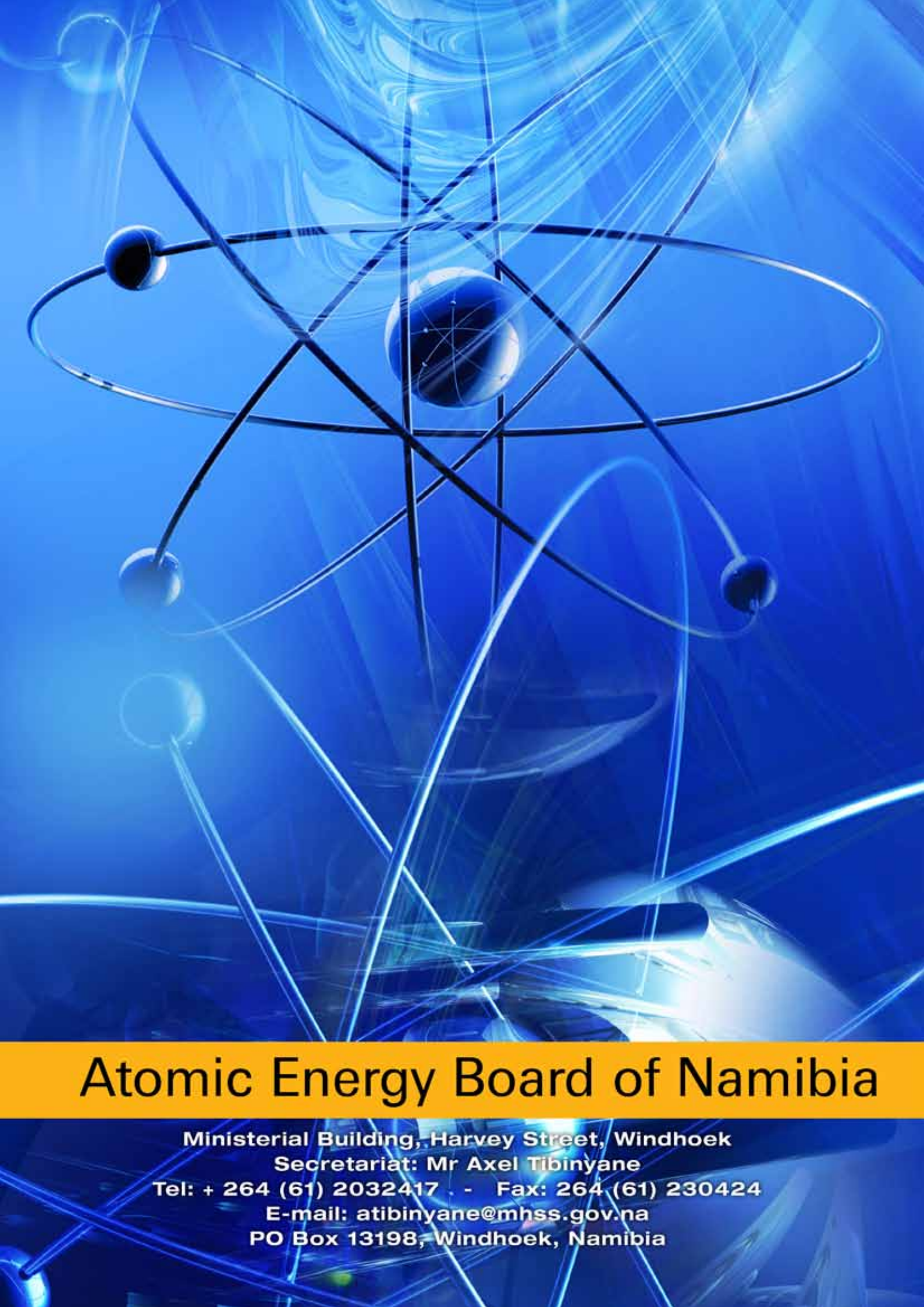

Atomic Energy Board of Namibia

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