Challenges in the Practical Implementation of the International Radiation Protection Standards: The FNRBA Perspectives

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Contents

AFRICA OVERVIEW

African continent is made up of 54 countries

Broadly divided into North Africa and Sub- Sahara Africa

Africa has the potential to become a new powerhouse in the 21st century

For global power, Africa is an emerging frontier that holds much promise and could potentially be a new sphere of influence.

In the coming years, Africa will play a growing role in global economics and demographics.

AFRICA OVERVIEW

TOTAL POPULATION

1.4 billion

At the current 2.6% growth, population is expected to grow to 2.4 billion by 2060 with the media age being 18. 70% of the population is under 30 currently

GDP

$1.92 Trillion

Current GDP growth is at 4.1% annually

CO_2 EMISSIONS

0.7 metric tons per capita

Globally, Africa accounts for the smallest share of global greenhouse gas emissions at just 3.8%

POWER CONSUMPTION

487.3 kWh per capita

ELECTRIFICATION RATE

48.4%

Africa is the least electrified continent in teh world. Nearly 600m people in sub-Saharan Africa live in the dark

FDI

$83 billion

Foreign direct investments (FDI) to African countries hit a record in 2021. Southern Africa, East Africa, and West Africa saw their investment flows rise.

TOP COUNTRIES EXPORTING TO SUB-SAHARA AFRICA

Cina (18%)

India (7%)

USA (6%)

Germany (5%)

OVERVIEW OF THE AFRICA

Currently, 11 African countries are currently considering adding new nuclear power to their energy mix

They are Algeria, Egypt, Ghana, Kenya, Morocco, Namibia, Nigeria, Senegal, Sudan, Tunisia, and Uganda, in addition to South Africa which is the only country on the continent to have an operating nuclear power plant.

Over the past years, there has been significant progress regarding nuclear energy implementation in various countries of the continent such as identifying the site for the upcoming future nuclear power plants, drafting nuclear laws and regulation

Several established dedicated nuclear organizations, calling for RFI, conducting IAEA's INIR missions and working on its recommendations.

AFRICA OVERVIEW

Who are the key African countries pursuing nuclear energy? We have divided the countries into 3 tiers based on government support for nuclear energy, timelines and infrastructure activities.

The FNRBA

- Launched in 2009 in Pretoria, South Africa

The purpose of FNRBA is to provide:

- for the enhancement, strengthening and harmonization of radiation protection, nuclear safety and security regulatory infrastructure and framework in accordance with IAEA safety standards and security guidance among the members of FNRBA;

- and to be an effective and efficient internationally recognized forum for the exchange of regulatory experiences and practices among the nuclear regulatory bodies in Africa.

FNRBA Objectives and Membership

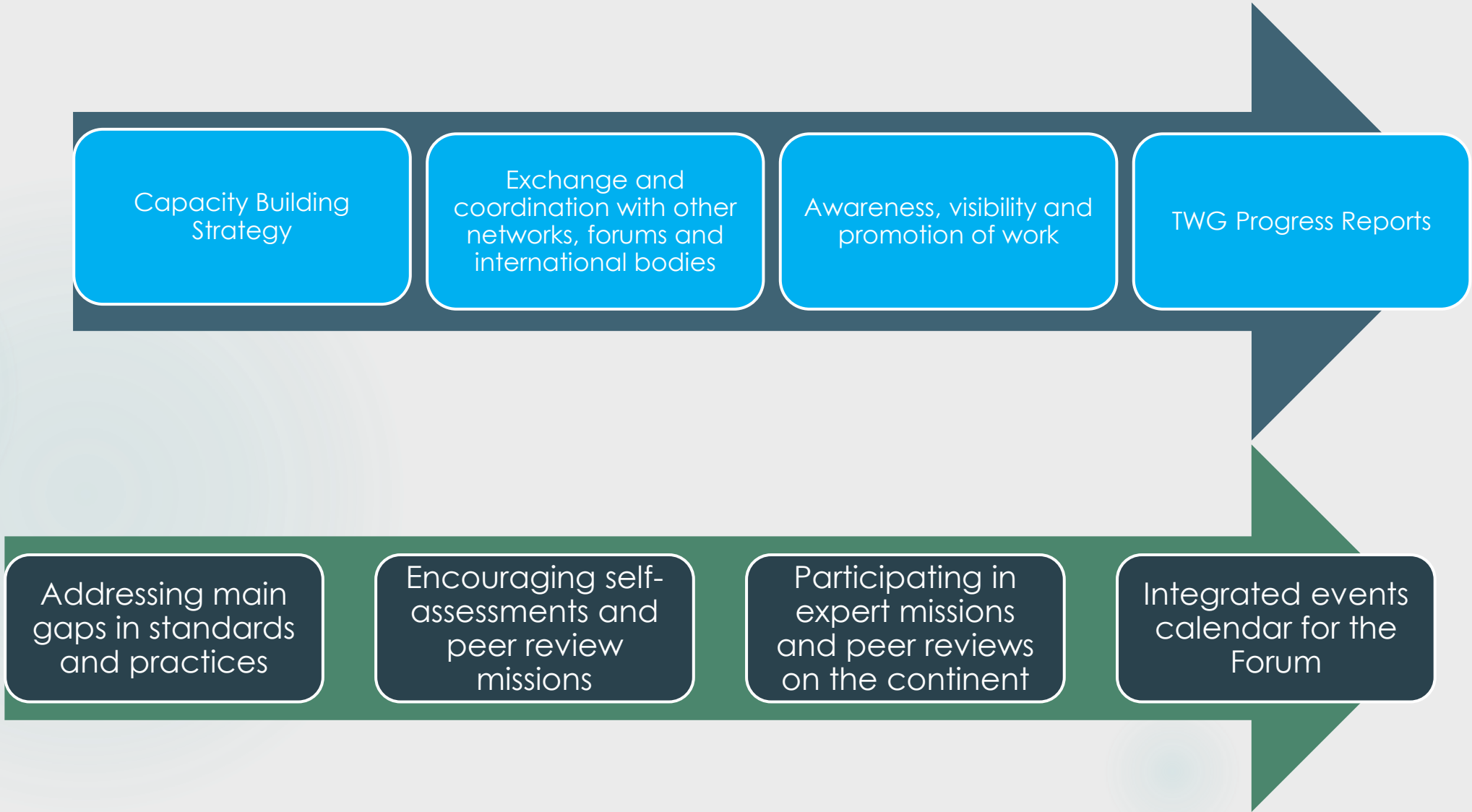
Objectives

- provide a platform for fostering regional cooperation and sharing good practices;
- provide the exchange of expertise, information and experience;
- provide opportunity for mutual support and coordination of regional initiatives, and
- leverage the development and optimization of utilizing resources.

FNRBA Membership:

- Open to all national nuclear regulatory bodies in African States on a voluntarily basis;
- In the case where there is more than one regulatory body, the country shall be entitled to designate one representative, and the rest shall be accorded observer status

SERVICES PROVIDED BY FNRBA



FNRBA Governance

The Plenary;

- consists of the entire membership of FNRBA, each represented by the Head or His/Her duly appointed collaborator

The Steering Committee

- Chairperson;
- Deputy Chair;
- Secretary;
- Deputy Secretary and
- One representative from each of the five regions of Africa

The Thematic Working Groups;

- TWG1 – Legal and Regulatory Framework
- TWG2 – Radiation and Waste Safety
- TWG3 – Nuclear Safety Infrastructure
- TWG4 – Emergency Preparedness and Response
- TWG5 – Transport Safety Infrastructure
- TWG6 – Nuclear Security Infrastructure

The Secretariat Services provided by the IAEA

Steering Committee of the Forum

ROLE	OFFICER
Chairperson	Ya'u Usman Idris (Nigeria)
Deputy Chairperson	Samy Shaaban Ata-Allah (Egypt)
Secretary	Emmanuel Ampomah-Amoako (Ghana)
Deputy Secretary	Justice Chipuru (Zimbabwe)
Regional Coordinator - North	Morocco (Said Mouline)
Regional Coordinator – South	South Africa (Ditebogo Kgomo)
Regional Coordinator – East	Kenya (James Keter Chumba)
Regional Coordinator – West	Ndeye Arame Boye Faye (Senegal)
Regional Coordinator - Central	Israel Tshimanga Mukoma (DR Congo)
TWG1 Coordinator	Adamu Hussaini (Nigeria)
TWG2 Coordinator	Augustine Faanu (Ghana)
TWG3 Coordinator	Olatunji Olaonipekun Okoya (Nigeria)
TWG4 Coordinator	Alan Muller (South Africa)
TWG5 Coordinator	Ihab Samir Abd El Fattah (Egypt)
TWG6 Coordinator	Assia Lasfar (Morocco)

FNRBA Regional Context

- A wide range of nuclear and radiation technologies are applied in the African Region and Member States have different levels of regulatory and technology development.
- One Member State is operating nuclear power plants, another Member State is constructing nuclear power plants while some countries have plans to embark on establishing nuclear power programmes.
- Eight Member States are operating research reactors while others are considering the possibilities of introducing or expanding such programmes.
- Most of the participating Member States are making use of radiation sources for medical, industrial and scientific applications.

Framework of the Strategic Action Plan for 2022-2027

- **PRIORITY 1**
  - Creating awareness of, and coordinating activities, amongst political and policy makers and other regional forums and organizations.

- **PRIORITY 2**
  - Implementing an efficient and effective network of human resources supported by an IT platform to ensure sustainable regional cooperation and to align national strategies for capacity building with IAEA methodologies.

- **PRIORITY 3**
  - Ensure understanding, development, promotion and implementation of high standards of radiation protection, nuclear safety and security in Member State.

- **PRIORITY 4**
  - Implementing capacity building activities at the national and regional level in radiation protection, nuclear safety and security regulatory infrastructure and framework and promoting and supporting sustainable regional cooperation in developing needed human resources.

- **PRIORITY 5**
  - Harmonization of the national plans for emergency preparedness and response, transport safety and security in line with international requirements to facilitate exchange of information and sharing of experience.

The Implementation of International Standards on Radiation Protection

- The closing resolutions of the Third African IRPA Regional Congress, Nairobi, Kenya, September 17, 2010 addressed the need for: "developing National/Regional Strategies and Infrastructures for Radiation Protection (RP) and fostering Co-operation and Networking among RP Professionals in Africa".

- Gaps in radiation safety knowledge, inconsistent safety practices and negative attitudes can impede the effective implementation of radiation safety protocols, potentially endangering patients and hospital staff.

Challenges

- In sub-Saharan African countries, the implementation of radiation safety measures faces unique challenges, including
- limited financial resources,
- inadequate infrastructure
- insufficient training of healthcare personnel
- the use of old and obsolete X-ray machines,
- a shortage of medical physicists and radiologists,

Challenges

- limited personal radiation protective equipment,
- non-availability of a radiation protection course,
- limited data on patient radiation doses,
- non-availability of diagnostic reference levels (DRLs),
- unjustified radiological examinations,
- shortage of Medical Physicists
- non-availability of imaging referral guidelines, and
- a lack of clinical audits and research on radiation protection.

others

- The operational causes of such risks may include poor, insufficient or inappropriate training, weak or absent ethical standards, and missing or inadequate operational policies and procedures.
- The causes can also lie in poor management, as for example, in inadequate or failed communications between top management and technical radiation staff.
- This may lead to underestimating the risks inherent in unsafe use of radiation, and breaches of compliance in respect of failing to follow strict regulations and good practices designed to prevent radiation risks.
- Such issues at the hospital or clinic level in turn may be caused, or aggravated by missing or inadequate laws, regulations or standards on the part of government in respect of safe uses of ionizing and non-ionizing radiation, or a failure to enforce such measures, including sanctioning and punishing those who breach them, with or without institutional tolerance or even encouragement.

Others

- Another potential cause of operational shortcomings may be uncertainty between different professional groups as to precise roles and responsibilities.
- This may open up unacceptable gaps in the chain of custody, prevent seamless patient care or even cause harm from radiation accidents or damage to equipment.
- These behaviours may even manifest themselves in territorial or boundary disputes between such groups, leading to abrogations of professional standards of conduct, either between professionals themselves or towards the patient.
- A good way to counter this risk is to insist on teamwork grounded in multidisciplinary practice, where the team has joint and several responsibility for safe, beneficial service delivery to the patient

Proposed Solutions

- To address these challenges, there will be the need to
- promote professional standards of training and practice among Radiation Protection Professionals in Africa
- found and foster Radiation Protection Societies or Associations at National and Regional levels
- promote formal [and informal] networks, drawing on existing infrastructures and training opportunities that are available in the region
- analogy imaging equipment in all hospitals including remote areas should be replaced with modern digital X-ray machines.
- As digital radiography is introduced into the healthcare system in the countries, radiographers and radiography technologists should be imparted with adequate knowledge and skills of the DR system through workbased learning in order to minimise the possibility of overexposing patients.

Proposed Actions to close the gaps

- In addition:
- continuous training and professional development for all levels of staff working in or managing radiation facilities, focused on a culture of safety
- the enactment and enforcement of appropriate laws and regulations the creation of professional bodies and associations to which staff can belong, each with its own codes of conduct, models of competency and disciplinary procedures, aligned to particular levels of professional responsibilities and/or duties
- the establishment of an independent quality assurance department or unit with responsibility for determining, monitoring and enforcing policies and procedures for safe radiation use
- the use of both internal and external auditing techniques to monitor, analyse and enhance work flow and operational procedures, and to build systemic capability through the exchange of experience, the digestion of lessons learned, and targeted intervention as needed. A particular requirement is to detect and treat any likelihood of the occurrence systematic mistakes or behaviours that may lead to radiation risk or accidents or harm any of the patients or the working staff. The use of positive performance measures is indicated.
- Formal training in RP with proven professional competency through professional certification is needed in addition to (emphasis added) education before he/she is qualified and entitled to practice the profession and teach others to practice

Thank you for your attention....