REGULATORY FRAMEWORK AND INTERNATIONAL REGIONAL PARTNERS' CONTRIBUTION TO THE IMPLEMENTATION OF NON-PROLIFERATION AND NUCLEAR SAFEGUARDS IN NIGERIA

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NIGERIAN NUCLEAR REGULATORY AUTHORITY

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OBJECTIVES

- Highlight the roles of international and regional partners in supporting non-proliferation efforts.
- Understanding Implementation of Non-proliferation and Nuclear Safeguards in Nigeria
- Analyze the effectiveness of nuclear safeguards in Nigeria and areas for improvement.

OVERVIEW OF NIGERIA

- Most populous in Africa with over 200 Million
- Situated on the Gulf of Guinea
- Capital City-Abuja
- 36 States
- 6 geopolitical Zones
- 3 Major languages (Hausa, Igbo, and Yoruba)
- 4 Major International Airport through which goods and services are imported into the country (Abuja, Lagos, Port-Harcourt and Kano)
- Major Sea ports (Port-Harcourt, Calabar, Lagos and Warri)
- Neighboring Countries (Benin, Niger, Cameroon and Chad)

INTRODUCTION

The need to mitigate non-proliferation of nuclear weapons and to foster global peace of security and safeguards of nuclear material accounting and control have necessitated the establishment of robust nuclear regulatory frameworks and International collaboration to ensure the effective implementation commitments by States under various nuclear Non-Proliferation and safeguards agreements across the globe.

NATIONAL LEGAL FRAMEWORK

➢The Nuclear Safety and Radiation Protection Act 19 of 1995 established the **Nigerian Nuclear Regulatory Authority** (NNRA) with the responsibility for nuclear safety and radiological protection regulation in Nigeria.

➢Act 19 of 1995 to be repealed by the National Assembly and to be named **Nuclear Safety, Security And Safeguards Bill in 2021**

➢**Nigerian Nuclear Safeguards Regulation 2021(NNSR)**

NATIONAL AND INTERNATIONAL LEGAL INSTRUMENTS

Non-proliferation treaty-5th March 1970
(Active)

Comprehensive Safeguards Agreement (CSA) INFCIRC/358 - 29th February 1988
(Active)

Small Quantity Protocol (SQP) - 29th February 1988
(Rescinded August 2012)

Comprehensive Test Ban (CTBT) - 27th September 2001
(Active)

Additional Protocol (AP) INFCIRC/358/Add.1 - 4th April 2007
(Active)

Pelindaba Treaty - 15th July 2009
(Active)

APPLICATION OF NUCLEAR TECHNOLOGY IN NIGERIA

There are diverse applications of nuclear techniques and radioactive sources in Nigeria. Some of which include:

- Oil and Gas Industries
- Research Institutes
- Medical Applications
- Manufacturing and Construction Industries
- Agriculture

THE IMPLEMENTATION OF NON-PROLIFERATION AND NUCLEAR SAFEGUARDS IN NIGERIA

The non-proliferation regime in Nigeria is structured around international treaties, national laws, and regulatory frameworks aimed at preventing the spread of nuclear weapons and ensuring the peaceful use of nuclear technology. As a signatory to the Treaty on the Non-Proliferation of nuclear weapons (NPT), Nigeria has committed to not pursuing nuclear weapons. The country collaborates with international organizations like the IAEA, USDOE, IRSN, INSEP to establish regulatory frameworks aimed to strengthen nuclear safeguards implementation, and promote the safe use of nuclear energy for peaceful application. Additionally, Nigeria participates in various initiatives to strengthen non-proliferation efforts in Africa. Key components includes:

- National Legislation
- International Cooperation.
- Capacity Building
- Regional Cooperation

NUCLEAR SAFEGUARDS OBLIGATIONS

THE NNRA ACHIEVES ITS SAFEGUARDS OBLIGATIONS THROUGH THE FOLLOWING MEASURES

- Development of laws, regulations and guidance document that will aid the implementation of a State System of Accounting for and Control of nuclear material, which ensure that the obligations of the Safeguards Agreement and associated protocols and subsidiary arrangements are fully met;
- Conduct Inspections in nuclear facilities or where nuclear material are located;
- Provision of timely, correct and complete reports and declarations to the IAEA;
- Create awareness via trainings, seminars and workshops;
- Facilitate/Provide support to the IAEA Inspectors during In-Field Activities to Nigeria.

DOMESTIC SAFEGUARDS ACTIVITIES IN NIGERIA

The NNRA is empowered by Act 19 of 1995 to carry out inspections including domestic Safeguards Inspection.

Locations Outside Facilities

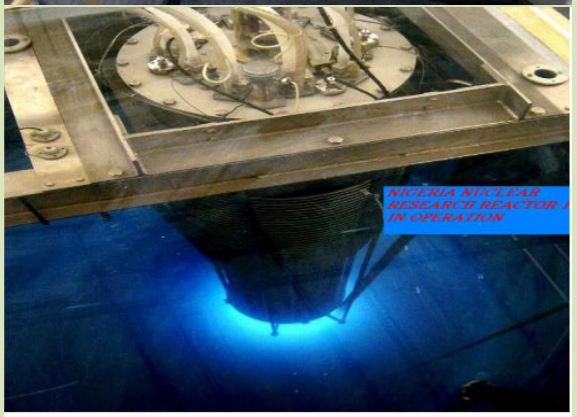
- The LOF are comprised of Industries and Hospitals using Depleted Uranium for radiation shielding purposes.
- Depleted Uranium used in Transport container, Medical Tele-therapy head shield..
- Domestic Inspections are carried out on quarterly bases.

IAEA ANNUAL INSPECTION

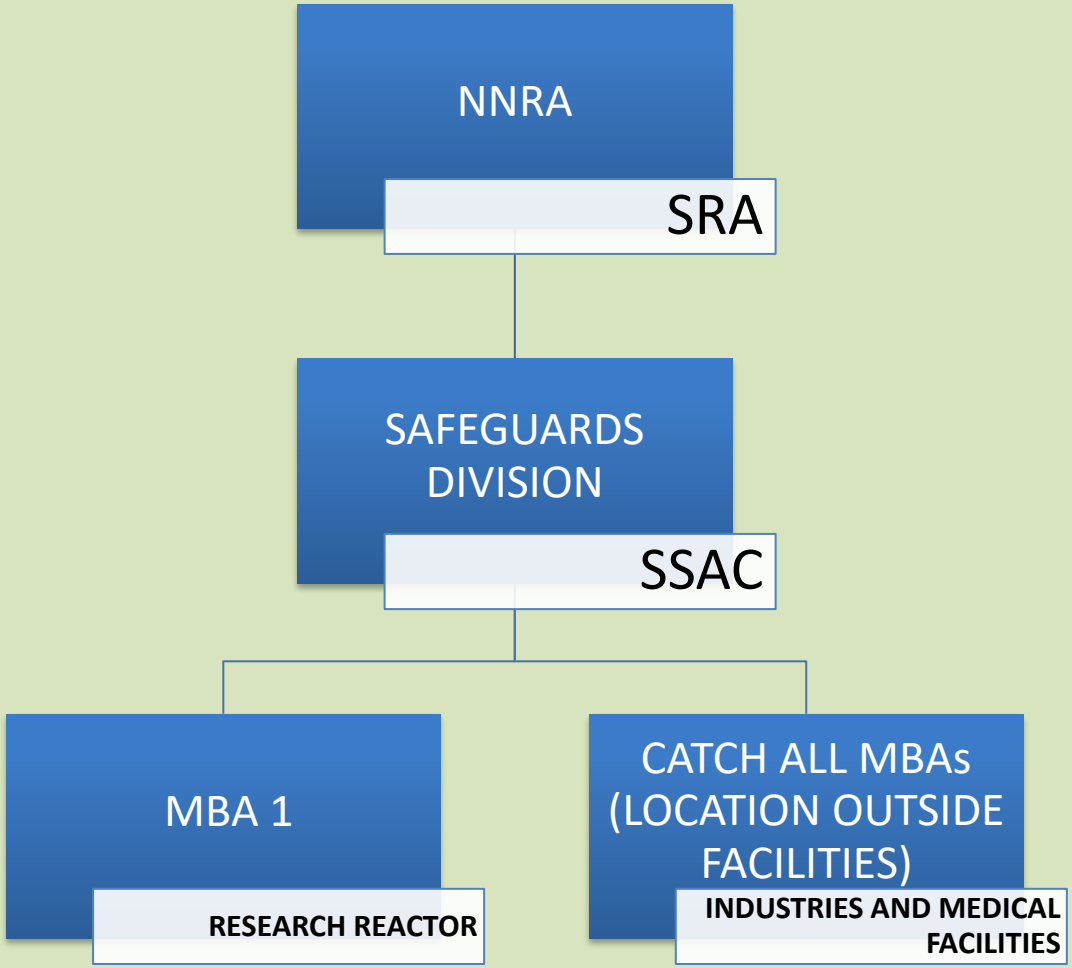
The IAEA Physical Inventory Verification (PIV) Inspection is conducted annually to verify the Nuclear Material in the country.

Nigerian Research Reactor-1 (NiRR-1) – Zaria

- NiRR-1 is a tank in pool reactor with a nominal power of 34kW using LEU
- In the last quarter of 2018, the core was converted from HEU to LEU .
- IAEA Annual Safeguards Inspection is conducted once a year to this facility or as the need may arise.



NUCLEAR SAFEGUARDS INFORMATION FLOW CHART



CONTRIBUTIONS OF INTERNATIONAL REGIONAL PARTNERS (1/1)

International Collaborations have been vital in bolstering Nigeria's nuclear safeguards implementation and non proliferation regime. Key contributors include:

- International Atomic Energy Agency (IAEA)
- African Commission on Nuclear Energy (AFCONE)
- US Department of Energy (USDOE)
- International Nuclear Safeguards Engagement Program (INSEP)
- National Nuclear Security Administration (NNSA)

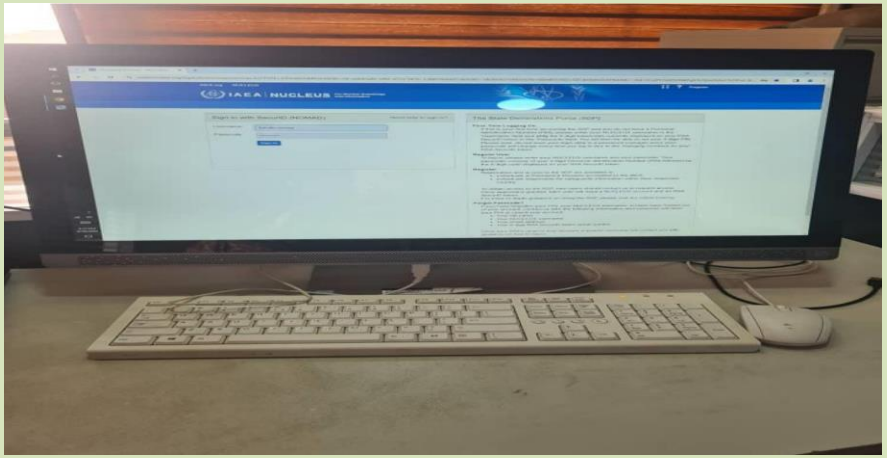
IAEA REGIONAL TRAINING COURSE ON STATES SYSTEM OF ACCOUTING FOR AND CONTROL OF NUCLEAR MATERIAL (SSAC) 4-15 DECEMBER 2023, PRETORIA, SOUTH AFRICA REPUBLIC

CONTRIBUTIONS OF INTERNATIONAL REGIONAL PARTNERS (1/2)

- **Technical Assistance:** International partners provide support in the area of Nuclear Safeguards Reporting tools and Equipment. e.g

A. PR3, SDP for Nuclear Safeguards Report preparation and submission to the IAEA) e.g NMA and AP reports.

B. Radiation detection equipment, and secure communication systems.



Inspection Kits and equipment vehicle

CONTRIBUTIONS OF INTERNATIONAL REGIONAL PARTNERS (1/3)

TRAINING/WORKSHOP PROGRAMS

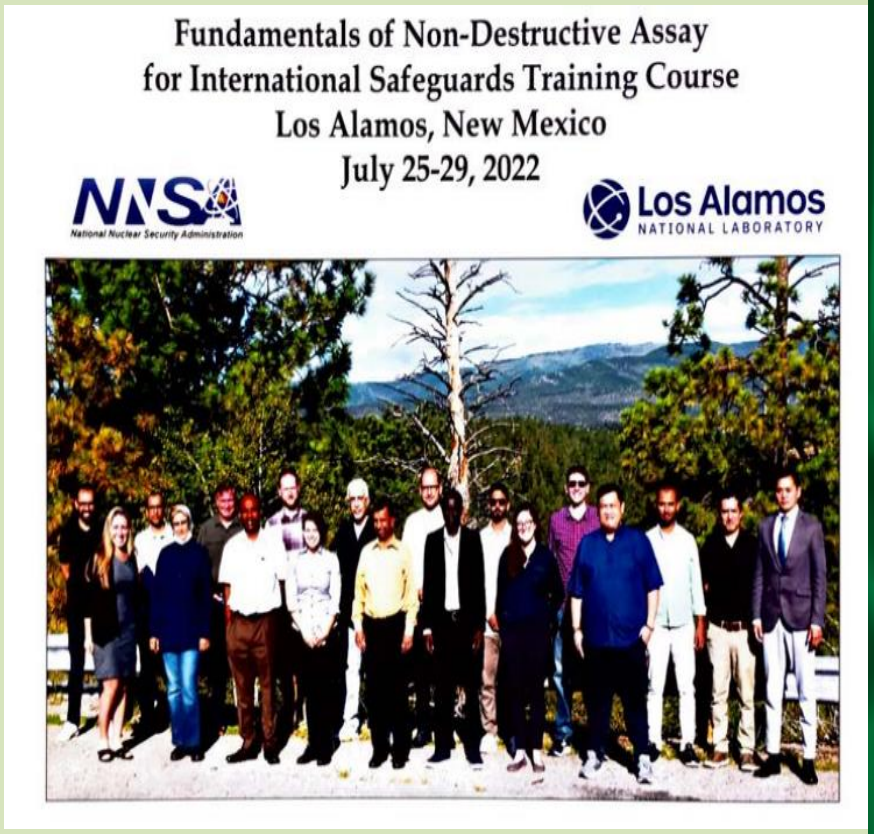
Specialized training/workshop programs are conducted to enhance the skills and knowledge of NNRA personnel. These programs cover various aspects of nuclear security, safety, and safeguards, including:

- **Nuclear Safeguards Implementation**
- **Inspection Procedures**
- **States System of Accounting for and control of Nuclear Material**

Group photo of participants at the international training course on Implementing Nuclear Safeguards in practice organized by Institute for Radiological Protection and Nuclear Safety (IRSN) 27-31 May 2024, Paris, France

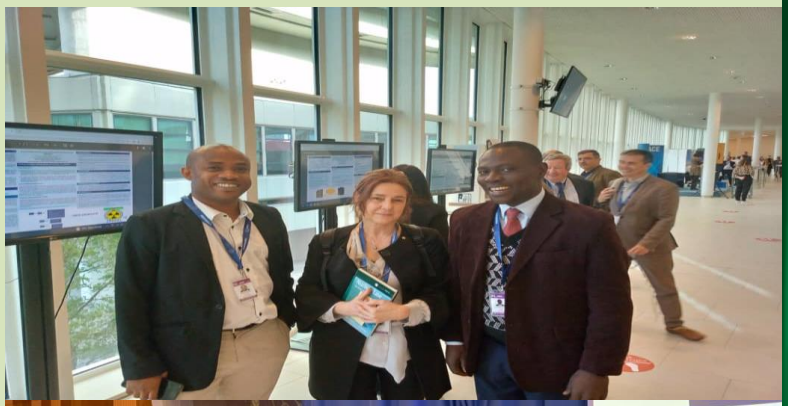
CONTRIBUTIONS OF INTERNATIONAL REGIONAL PARTNERS (1/4)

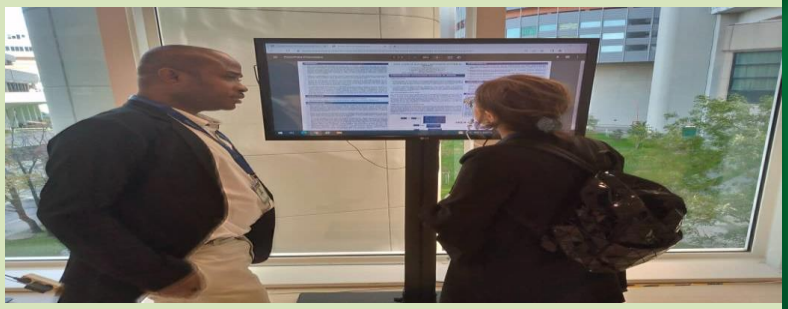
Regional Workshop On Developing Safeguards Related Regulatory Document 2nd -4th March 2015 Voi Wild Lodge Kenya, Organized By USDOE/NNSA/INSEP



NUCLEAR SAFEGUARDS ACHEIVEMENTS (1/1)

- The NNRA participated in the IAEA 2018 and 2022 International safeguards symposia where a poster presentation titled "Evolution of Nuclear Safeguards in Nigeria"
- The International Atomic Energy Agency (IAEA) in the year 2020 drew a broader conclusion on Safeguards activities and implementation in Nigeria for the first time;
- Nigerian Nuclear Safeguards Regulation 2021





NUCLEAR SAFEGUARDS ACHEIVEMENTS(1/2)

Technical Support → **Training** →

1. National Training course on foundation of national Safeguards Inspection 29th August -2nd September 2016. USDOE /INSEP
2. Workshop on developing a national nuclear safeguards inspection programs 10th-14th July 2017, OAK RIDGE, Tennesse USA
3. International Training for Safeguards on Non-destructive Assay (NDA) training at Los Alamos New Mexico USA, 26th -30th Sept , 2022
4. National training on information collection and management for nuclear Safeguards 12th – 16th

Procurement of Technical Equipment →

Nigeria through the NNRA has purchase HM-5 identiFINDER to enhance the domestic safeguards inspection

Reporting Tool →

- Use of Protocol Reporter 3 as means of electronic reporting system to the IAEA
- State Declaration porter (SDP) for communication to IAEA

CHALLENGES

- **H**uman Capacity Building specialized for Safeguards Inspectors; (Training and Re-training)
- Lack of requisite knowledge on nuclear safeguards obligations on the part of the operators;
- Non-notification of import and export of radioactive materials, equipment and devices that are of Safeguards interest in violation of Nigerian Nuclear Safeguards Regulation (NNSR), 2021;
- In-ability to identify DU information on some defaced source projectors due to their obsolete status

ACKNOWLEDGMENT

We would like to express our profound gratitude to the International Atomic Energy Agency (IAEA), the US Department of Energy (USDOE), the International Nuclear Safeguards Engagement Program (INSEP), the National Nuclear Security Administration (NNSA), the Institute of Radiation Protection and Nuclear Safety (IRSN), Mr. Enobot Agboraw, Executive Secretary General of the African Commission on Nuclear Energy (AFCONE), Mr. Audu Usman Mohammed, Director of Nuclear Research Reactor, Safety and Safeguards at the Nigerian Nuclear Regulatory Authority (NNRA), all staff in the Safeguards Division, and for their invaluable assistance and support during the preparation of this presentation. Additionally, we would also like to appreciate the Institute of Nuclear Materials Management (INMM) for given us the platform to make this presentation.

CONCLUSION

Nigeria through the NNRA will continue to perform all necessary functions to enable her meet her National and International Obligations in the application of nuclear technology for peaceful Uses.

THANK YOU FOR YOUR ATTENTION!!!