PHYSICAL PROTECTION OF NUCLEAR MATERIALS AND NUCLEAR FACILITIES; NIGERIA NUCLEAR RESEARCH REACTOR CORE CONVERSION PROJECT

R. A. Onoja (P.hD., CNSP)
Center for Energy Research and Training,
Ahmadu Bello University
Zaria, Nigeria.
raonoja@yahoo.com

Presentation Plan

- Introduction
- CERT Services
- Physical protection system in Nigeria
- HEU conversion of NIRR-1
- Progress and challenges PPSN
- Conclude

Introduction

- The threats from terrorist attacks are in the increase and the nature of attack keeps changing.
- This has been a concern to all states with Nuclear Materials as well as Facilities.
- Calls for NSS for four periods.
- Nigeria is present in all the summits and indicated there interest in joining in the campaign of combating terrorism.
- Nigeria supports the international organization on security and protection of nuclear materials and nuclear facilities.

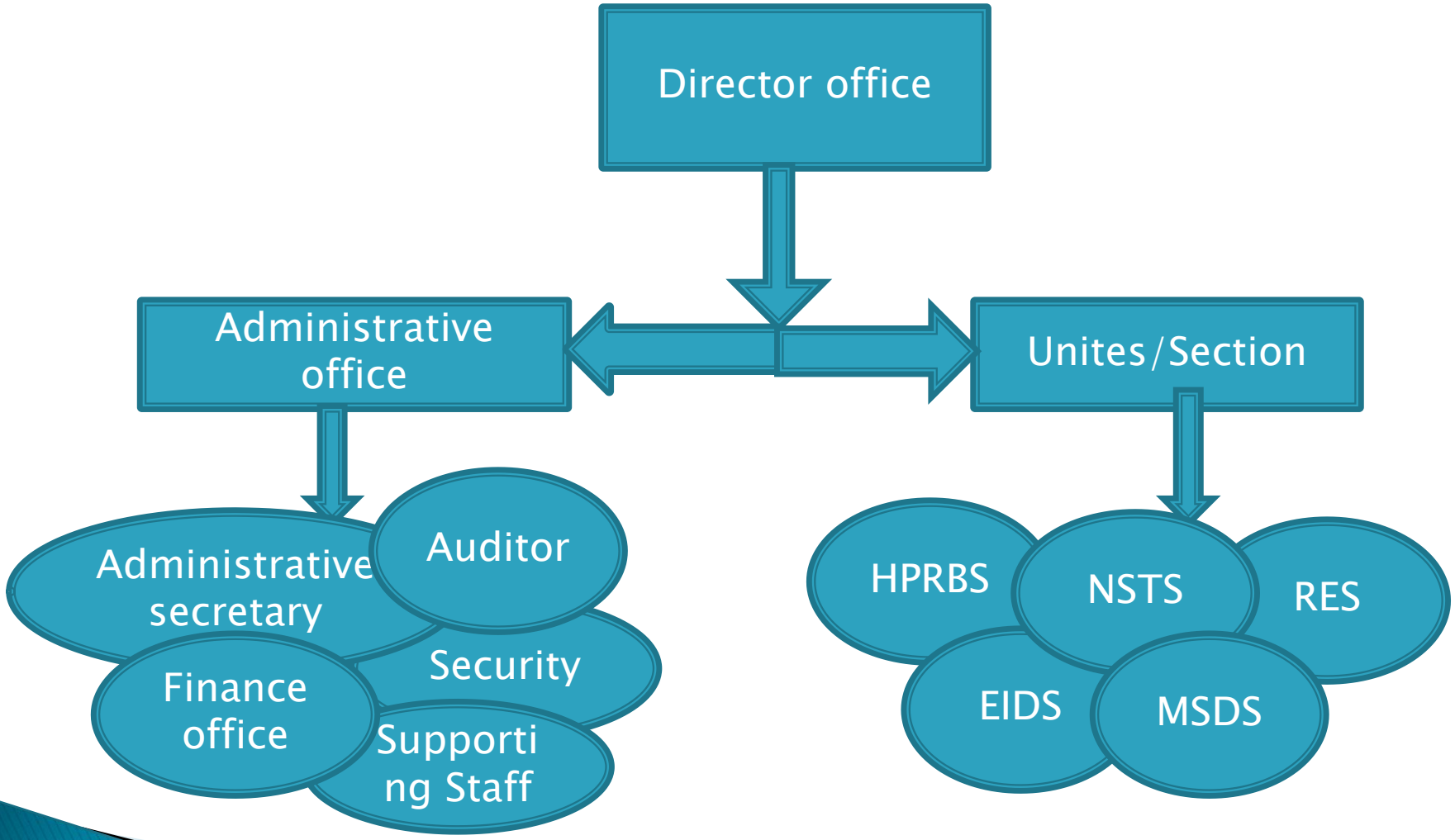
- Nigeria Has 155 Universities
  - 42 federal universities
  - 46 state universities
  - 67 private universities
- Five (5) built Nuclear Energy Centers
  - CERD OAU Ibadon
  - CERT ABU Zaria
  - CNERT University of Maiduguri
  - CNES Uni Port
  - CNEST FUTH Owerri
- Nuclear Technology Center Sheda, Abuja
- NNRA founded in 1995 and stated operation in 2001

Figure 1.0 showing the map of Nigeria and some of its neighboring countries

CERT Services

- Dosimetry Services/ radiation work place assessment
- Workplace shielding integrity evaluation
- Research in various field
- Teach in the Universities
- Training
- Production of LN
- Sample Analysis

CERT Structure of work Frame



Physical Protection Systems in Nigeria

- DBT incorporated in Nigeria licensing process for relevant stakeholders to comply with in building appropriate physical protection system for radiological materials and nuclear facilities to ensure security of the facilities.
- Developed with the assistance of some stake holders.
- Collaboration is ongoing effectively with the relevant bodies/stakeholders in Nigeria to ensure safety, security and safeguard of radiological materials and nuclear facilities in the country.
- Convention on Physical Protection for Nuclear Material and its amendment.

- Facilitated the Agency's effort in promoting and encouraging the region support to speed up the universalization of the convention and herald the coming into force of the 2005 Amendment
- Nigeria promised to join and take necessary actions to strengthen its partnership with the international community to ensure and sustained a global nuclear security regime.
- Nigeria in conjunction with relevant stakeholders are reviewing the Design Basis Threat (DBT).

- Nigeria has signed an agreement of cooperation with the United States Department of Energy (US-DOE) Office of Radiological Security (ORS). The objectives is to reduce and protect vulnerable nuclear and other radioactive material and to prevent theft or sabotage.
- The cooperation included Physical Security upgrades of some high risk radiological facilities.
- Nigeria is partner with the International Organizations for capacity building particularly in the development of the Nigerian Nuclear Security Support Centre, Physical security upgrades and HRP
- The physical security system in CERT facilities was first access in 2004 by NNRA and subsequently by expert from IAEA

HEU Conversion Programme for Nigeria Research Reactor 1 (NIRR-1)

- NIRR-1 is a 31.1 kW
- Became critical 2006
- Used HEU
- In collaboration with the IAEA, Nigeria government commenced discussions on developing human capacity for the HEU fuel conversion to LEU
- IAEA fellowship was secured for two Nigerian regulatory Officers at Argonne National Laboratory on core conversion studies in 2012. Since then, short training courses were organized also for CERT staff for the period 2015-2017.

- CERT staff were selected to observe and attend trainings on
  - HEU core removal,
  - Core loading into TUK/145 cask
  - loading of LEU into the reactor core
- A team is preparing to go for a general training on the removal of core and loading of fuel into cask and reactor core.
- The Sister country (Ghana), is used for most of the trainings.
- Ghana had already installed the LEU nuclear fuel in the GHARR-1 in August 2014.

- Nigeria was in attendance at the 35th International Meeting on Reduced Enrichment for Research and Test Reactors and the Consultancy Meeting on MNSR held in Vienna, Austria in October and December 2014 respectively.
- In May 2017 a group form HPRBS received a training on "**a hand–on training on radiation protection services in general at a research reactor and radiation protection tasks at a loading operation of transport container and transport"** at Budapest, Hungary.
- Most trainings were supervised by the IAEA, the key actor, and were jointly sponsored by IAEA, Idaho and Argon National Laboratory, with the expert services of SOSNY, UJV and china.

- Today, Nigeria is present at this international conference on Physical Protection of Nuclear Material and Nuclear Facilities, Vienna Austria to discuss on the prospects and challenges of physical protection systems in place.
- China Institute of Atomic Energy CIAE had been asked to procure the LEU core and commence the design and fabrication of cask.
- This was signed in the second quarter of 2016.
- Since then, there had been series of visits, to the facility by IAEA delegated experts and members, with reports written.
- Nigeria, awaits it conversion of core by November 2017.

Progress and Challenges of Physical Protection Systems in Nigeria

Progress

- Nigeria works closely with IAEA to ensure compliance with international regulatory requirements.
- IAEA regular annual Safeguards Inspection in 2003 and 2005
- International Nuclear Security Advisory Service (INNServ) Mission **August 2017**

- Nigeria in April 2007 signed the instrument ratifying the Convention on the Physical Protection of Nuclear Material and Amendment to the Convention on the Physical Protection of Nuclear Material.
- Nigeria present in all Nuclear Summits, Nigeria strengthened nuclear security implementation and built up the nuclear security architecture and other radioactive material security.
- Under the coordination of the Office of National Security Adviser (ONSA), Nigeria has established a National Nuclear Security Centre (NNSC) in Abuja.
- Facilitate and sustain human resource development and to provide technical systems for sustainace of an effective security support.

- Another progress is in the development and reviewed of the country's Design Basis Threat, was developed in 2012.
- This document is under review and update, to accommodate the current evolving threat in the nuclear industry.
- Trainings and workshop
  - PDC; Insider threats to nuclear facilities
  - Fundamentals of physical protection at facilities holding nuclear and radiological materials
  - with the support of the US Department of State (Partnership for Nuclear Security), WINS and the NNRA conducted a National Training on Preventing Homegrown Violent Extremism in the Nuclear Sector in July 2017 at Abuja, Nigeria.
  - Many Nigerians are CNSP

Challenges

- Funding of research development,
- Procurement of modern laboratory facilities and equipment,
- Staff training
  - installation, maintenance, and repairs of faulty systems
  - ICT security
- Political will to identify, sanction and mitigate homegrown violent extremism (HVE).
- Activities of dishonored official in the government establishment
- lack of transparency in governance

cripple effort to the sustainace of an effective security and hinder performance of physical protective system in the country.

Conclusion

- Nigeria recognized the importance of the security of radioactive materials as well as the physical protection of the nuclear facilities and therefore intends to strengthen its partnerships with relevant international organizations to promote capacity building, which amongst others, include Physical Security Upgrades.
- Nigeria first installed Radiation Portal Monitor (RPM) at the Murtala Muhammed International Airport Lagos in 2008 which became operational in April 2009. Another Three more were procure and installed at the end of 2016.

- I acknowledged the Organisers of this Conference
- IAEA
- Director, CERT
- An academia professor (Professor S.A. Jonah)