The Role of the Nigerian Research Reactor in Contributing to the Sustainable Development Goals (SDGs) and Small Modular Reactor (SMR) Deployment in Nigeria

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Brief Introduction of the Nigerian Research Reactor (NIRR-1)

• It is a tank-in-pool type, low power (34Kw) miniature neutron source reactor
• Began operation in the year 2004
• Was converted from HEU (90.2%) to LEU (13%) in the year 2018
• Its license was renewed in the year 2021.
Current Utilization of NIRR-1

• Neutron Activation Analysis
• Education and Training

NIRR-1 Pneumatic transfer system

Multichannel analyzer and its Maestro emulation Software

Detector
Contribution of NIRR-1 to the Sustainable Development Goals (SDGs) in Nigeria

• Soil Fertility Mapping---------------------SDG 2: No Hunger

• Training of present and future generation of nuclear engineers and scientists ----SDG 4: Quality Education
Soil Fertility Mapping

• Soil samples from strategic locations are collected
• Samples are irradiated in the reactor, and Neutron Activation Analysis is performed
• The aim is to provide information and data to farmers to aid them in making decisions with regards to suitability of each soil for planting particular crops
• The plan is to map the entire Nigerian soil
• A pilot mapping project in the Zaria area has already been done using NIRR-1
Education and Training

• For primary and secondary students
  ❖ excursions
• For university students
  ❖ excursions
  ❖ bachelor's degree
  ❖ master’s degree
  ❖ doctorate degree
• For continued professional development
  ❖ Regulators
  ❖ Researchers
  ❖ Stakeholders
• For the general public
How NIRR-1 Can Contribute to the SMR Deployment in Nigeria

• Model for formulating the regulatory oversight and licensing of SMRs
  ❖ The Nigerian nuclear regulator has gained many years of experience in overseeing and regulating the NIRR-1 facility

• Example to the government, the stakeholders, and the general public that requirements of safety, security and safeguards of SMRs can be met in Nigeria
  ❖ The facility has been successfully operated safely for many years without any accidents or incidents

• Resourcefulness
  ❖ Readily available resource persons at the facility that can be consulted
  ❖ Provision or training of manpower
Prospects for the Utilization of NIRR-1

• Production of medical radioisotopes
  ❖ **SDG 3:** Good Health and Wellbeing

• Internet Reactor Laboratory
  ❖ **SDG 4:** Quality Education
  ❖ **SDG 16:** Partnerships for the goals
Conclusion

• The Nigerian research reactor has the potential to contribute to the Sustainable Development Goals (SDGs) and the deployment of SMRs in Nigeria. Over the years, the utilization of the reactor has yielded successes in this respect.

• Researchers working at the reactor facility are working towards realizing the utilization of the reactor in such areas as radioisotope production, which can contribute to the SDGs.
Thank you for Listening