

Nuclear security: From securing one nuclear facility to securing the nation

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In recent years, Nigeria has faced a number of security challenges, from terrorism to hostage-taking for ransom. Although Nigeria's only operating research reactor — Nigeria Research Reactor-1 (NIRR-1) — has operated for more than a decade without a security incident, we remain vigilant in order to protect our nuclear and radioactive material and facilities in the face of this evolving security environment. Our commitment to nuclear security has led to improvements in security processes and procedures at NIRR-1 and at all of Nigeria's critical infrastructure facilities.

The Centre for Energy Research and Training (CERT), which operates the NIRR-1, has cooperated with international partners, including the IAEA, to strengthen nuclear security at the facility. The facility has undergone a comprehensive physical security upgrade to minimize the possibility of an outsider attack. In 2018, in cooperation with the IAEA, the reactor core was converted and refuelled with low enriched uranium fuel to make the nuclear material and facility less attractive to criminal groups.

However, security is not adversary-centric. Human factors can also lead to a breach of security. Intentional or unintentional security vulnerabilities created by facility personnel and vulnerable operating processes and procedures, commonly referred to as insider threats, are among the most serious security issues facing nuclear and other industries. There have been several security incidents at facilities containing nuclear and other radioactive material around the world involving personnel and contractors. These include the theft of nuclear and/or radioactive material, theft of sensitive nuclear design data and sabotage.

Financial issues, family problems, political or religious extremism, mental well-being or work-related issues may turn a trusted employee into a potential insider threat.

The increased concerns about the security of nuclear and other radioactive material and facilities mean that security at such facilities requires the presence, judgment

and decision-making capabilities of individuals who recognize that certain human behaviours and characteristics may have an impact on the organization's effectiveness. With the increased threat posed by terrorism, it is important to develop a programme for vetting and monitoring individuals who can be trusted with the access to and responsibilities for nuclear and other radioactive material and facilities, as well as other critical infrastructure facilities.

To address insider threats, within the broader context of national and international threats, CERT has implemented a human reliability programme (HRP) at its NIRR-1 facility. Its primary objective is to ensure security and safety by employing reliable and trustworthy individuals. CERT provides training for all staff, with increased training for those in critical positions, to recognize, report and mitigate risks associated with potential insider threats. NIRR-1 facility managers also follow the HRP processes

and procedures in order to identify individuals who may present security and safety reliability concerns owing to physical or psychological disorders, substance abuse or other life circumstances.

Insider threats are not only a concern for nuclear facilities; insider threat mitigation programmes, such as the HRP at the NIRR-1, are applicable to all critical infrastructure facilities and industries. As a result, recognizing the utility and the successful implementation and operation of the HRP, Nigeria's Office of the National Security Adviser (ONSA) mandated the implementation of such programmes at all of Nigeria's critical infrastructure institutions.

The approach we have taken to ensure our staff have the attitudes and the best qualifications to support the success and sustainability of our nuclear science and technology programmes, including nuclear energy, has proven to be applicable across the industry and national security.