

Developing Capacity for Nuclear Decommissioning: The Nigeria Experience

J. Simon^{a*}, Y.V. Ibrahim^b, S.A. Jonah^b, A. Asuku^b and H. A. Adamu^b

^a*Department of Physics, Ahmadu Bello University, Zaria, Nigeria*

^b*Centre for Energy Research and Training, Ahmadu Bello University, Zaria, Nigeria*

^{a*}*Corresponding author: Email: sjkahugu@yahoo.com*

Considering the growing number of nuclear facilities entering permanent shutdown, it is crucial to review lessons learned and adopt best practices to ensure effective decommissioning, dismantling, and remediation. The key to successful decommissioning lies in having competent personnel involved in the process. Therefore, organizations responsible for future decommissioning projects must prioritize the development and implementation of robust human resource management practices, policies, and training programs for all stakeholders involved. The Nigeria Research Reactor-1 (NIRR-1) is a low-power reactor located at the Centre for Energy Research and Training (CERT) in Ahmadu Bello University, Zaria. After operating for 12 years with Highly Enriched Uranium (HEU) fuel, it underwent partial decommissioning to mitigate proliferation risks by converting the fuel to Low Enriched Uranium (LEU). The decommissioning process was preceded by rigorous trainings and drills facilitated by the International Atomic Energy Agency (IAEA) and the US Department of Energy (DoE). The decommissioning preparation began with training personnel on spent fuel characterization and transport cask design and thereafter, operators were trained to be proficient in core removal and package loading operations, while the radiation protection team received comprehensive training on emergency preparedness and response. Security measures were strengthened by assembling a team comprising university guards from CERT and personnel from Nigeria's armed forces, including the police, customs, and immigration. Thanks to the extensive training and drills conducted on and off-site, the decommissioning process was executed efficiently despite Nigeria's security challenges. However, valuable lessons were learned during the preparatory phase as internal personnel transfers within the university affected trained administrative staff and security guards, leading to duplicated efforts, increased costs, and delays in implementation. Furthermore, the sustainability aspect was overlooked during the personnel training as none of the trained personnel were on internship or fellowship, which implies that none would be available to bring their experience to bear on the next decommissioning project. This will necessitate significant investment to train a new workforce. Overall, the Nigerian experience emphasizes the importance of capacity building for nuclear decommissioning and highlights the need for comprehensive training programs, considering personnel sustainability, and effective coordination among stakeholders.