GHANA'S NUCLEAR SECURITY: PROGRESS, CHALLENGES, AND THE WAY FORWARD

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Abstract

The paper assesses Ghana's Nuclear Security Regime in the wake of sustained upsurge in the frequency of activities of extremist groups in the West African sub region. Highlights the key challenges Ghana is facing in implementing its Nuclear Security regime, and recommends a number of next steps for a forward outlook. The formation of the Nuclear Regulatory Authority, Physical Protection upgrades in facilities and sustained cooperation with both local and international stakeholders in nuclear security like the Bureau of National Investigation, Immigration Services, Custom Excise and Preventive Services, Ghana Police Service, Ghana Armed Forces and the IAEA, The United States Department of Energy's National Nuclear Security Administration (NNSA) Office of Radiological Security (ORS), the Lawrence Livermore National Laboratory, ROSATOM and Government of China were found to be major progress made in advancing Nuclear Security in Ghana. Some challenges identified included the delay in the formulation of regulations for nuclear security by the regulator, and the lack of realistic force on forces exercises the test the adequacies of the systems provided for security. On the way; forwards the paper proposes some actions including; conducting of a force-on-force exercise involving all major stake holders and expanding the activities of the Nuclear Security Support Centre into a Centre of Excellence for Nuclear Security in the region.

1. INTRODUCTION

Nuclear and radiological terrorism remains a serious threat [1]. Between 2010 to 2016 world leaders gathered for four Nuclear Security Summit, in Washington, Soule, Netherland and Washington respectively in 2010, 2012, 2014 and 2016. The summits which were organised under the auspices of the former US president Barack Obama was a biennial summit meant to harness global effort to address radiological and nuclear terrorism which has become a global issue till date.

Following the submit, Ghana with the support of the U.S. Department of Energy's National Nuclear Security Administration (DOE/NNSA), the International Atomic Energy Agency (IAEA) and China has successfully converted its Miniature Neutron Source Reactor (MNSR) from highly enriched uranium (HEU) to low enriched uranium (LEU) fuel [2]. This shows Ghana's commitment to global efforts to enhance Nuclear Security locally and internationally.

In Africa, inadequate prevention, detection and response mechanisms to malicious acts involving nuclear or other radioactive materials have been identified as priority areas for urgent attention. Together with the International Atomic Energy Agency (IAEA), African members states have conducted activities to help improve their systems for protecting nuclear and other radioactive material during use, storage and transport, and for combating the illicit trafficking of such material. According to the Africa Regional Cooperative Agreement for

Research, Development and Training related to Nuclear Science and Technology (AFRA), Nuclear Security is a global issue of regional significance and a priority for enhanced regional cooperation [3]

In 2015, Ghana passed the Nuclear Regulatory Authority Act, 895 [4]This Act of Parliament revoked the Radiation Protection Instrument, LI 1559 [5] which established the Radiation Protection Board under the Ghana Atomic Energy Commission (GAEC) by PNDCL 308 in 1993 and established a new Nuclear Regulatory Authority (NRA) as the statutory nuclear regulatory authority in Ghana independent of the Ghana Atomic Energy Commission which until then was the regulator and also a promoter of the peaceful use of Nuclear and other technologies in Ghana.

2. OBJECTIVE OF THE STUDY

This report examines Ghana's major progress in improving nuclear security Ghana, highlights the key challenges Ghana is facing in implementing its Nuclear Security regime, and recommends a number of next steps for a forward outlook.

3. THREAT TO NUCLEAR TERRORISM IN WEST AFRICA AND ITS IMPACT ON GHANA

The last decade has seen a dramatic change in the character of violence in West Africa. Violence has shifted away from the large-scale conflict events and intrastate wars that characterized the postcolonial and post–Cold War periods toward an increase in low-level insurgencies and political violence by non-state actors [6]. Terrorism is of growing concern for the international community which in the recent past, has witnessed an increasing number of attacks at the hands of terrorist groups.

In recent years, West Africa has been facing terrorist attacks. The recurrence of attacks, such as the ones in Bamako in November 2015 (at the Radisson hotel), in Abidjan in March 2016 (attack in the seaside resort of Grand-Bassam) and in Ouagadougou in January 2016 (attacks at the splendid hotel and the café-restaurant Cappuccino), have made the West and Central Africa region a "fertile breeding ground" for terrorism. Over the past decade the West African sub – region has seen much activities of extremist groups; the Al Qaeda in the Islamic Maghreb (AQIM), Ansar al Din ("Defenders of the Faith") , Jama'at Tawhid Wal Jihad fi Garbi Afriqqiya ("Movement for Unity and Jihad in West Africa," or MUJWA), National Movement for the Liberation of Azawad (MNLA) and recently Boko- Haram[1] (a violent extremist group based in Northern Nigeria which has recently sworn allegiance to the Islamic State) who have demonstrated both the will and capacity to escalate its insurgent activities.

Whiles these groups do not constitute a major military threat in the region, the potential for escalation of violence and the tendency that these group could one day consider using nuclear or other radioactive materials to push their extremist agenda make it imperative to address violent extremism and Nuclear Security in all its seriousness. However, counterterrorism efforts among governments within the region of operation of these groups remain uncoordinated and too narrowly focused to contain and confront long-term and sophisticated strategy of Al Qaeda in the Islamic Maghreb (AQIM), Ansar al Din ("Defenders of the Faith"), Jama'at Tawhid Wal Jihad fi Garbi Afriqqiya ("Movement for Unity and Jihad in West Africa," or MUJWA), National Movement for the Liberation of Azawad (MNLA) and recently Boko- Haram in the region. This is mainly due to the fact that these strategies fail to address the underlying factors contributing to the outbreak of these crimes as well as the complex linkages between them [6]. While significant progress has been made in reducing the risk to nuclear terrorism, the danger still persists and remains real and serous. Al Qaeda is still active. The organizations pursued nuclear weapons in the past, repeatedly attempted to acquire the materials and expertise needed to make them. It may try to do so again in the future. Although the Islamic State has not yet demonstrated a clear intent to acquire nuclear weapons, its apocalyptic ideology is worrisome, and its capabilities—with more money, more territory, and more world people responding to its call to join the jihad than al Qaeda ever had—could give it a greater chance of succeeding if it did to turn to nuclear weapons than previous terrorists have had [7].

Between 2013 and 2016, the James Martin Centre for Nonproliferation Studies (CNS) found 683 incidents of nuclear and other radioactive materials outside of regulatory control in 48 countries, 53 incidents involved

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[1] Officially called Jama'atu Ahlissunnah Lidda'awati wal Jihad, meaning a "People Committed to the Propagation of the Prophet's Teachings and Jihad"

nuclear materials; few of these involved nuclear weapons-useable materials and least 329 incidents involved materials highly suitable for radiological terrorism [8].

The aforementioned put the regions nuclear security under serious threat which calls for effective national and regional measures for nuclear security to facilitate the peaceful use of nuclear energy and radiation techniques, and as well as enhancing global efforts to combat nuclear terrorism.

There is increasing concern about cross border crime and its implications for the international community. Many factors such as weak states, porous borders, availability of Small Arms and Light Weapons (SALW), relatively free movement of persons and goods, the youth bulge, and the growing networks of transnational criminals make terrorism a regional concern that requires holistic regional responses especially for most west African countries which do not have sufficient human capacity, resources, legal frameworks and technology to fight terrorism [9].

In Ghana, there are complex issues confronting border security. The response mechanisms instituted to address the problems do not meet the modern required standards to ensure effective security and the borders of Ghana have become major transit points for human, firearm and drugs trafficking as identified in the categorization of cross border crimes in West Africa [10]. Ultimately, if these issues remain unchecked, it possesses a threat to nuclear security in the region as a whole and provide an avenue for non-state actors to use these same channels to smuggle stolen Nuclear Materials or Radioactive sources into the country posing serious threat to the country's national security.

4. GHANA'S NUCLEAR SECURITY: PROGRESS AND CHALLENGES

Over the past decade, Ghana has implemented strategies to prevent malicious acts involving the use of nuclear material or radioactive sources and associated facilities. In 2006, Ghana received its first International Nuclear Security Advisory Service (INSServ) mission and also conducted the Radiation Safety and Security of Radioactive Sources, Infrastructure Appraisal (RaSSIA). Following that the International Physical Protection Advisory Service (IPPAS) was also carried out in March 2007. Key recommendations at that time were that Ghana's Legislation were not yet compatible with international standards and guidance which was reviewed for gaps and omissions;

These recommendations facilitated the development and adoption of the Ghana Integrated Nuclear Security Support Plan (INSSP) [12] - Jointly developed by Ghana with support from IAEA forms the baseline guidance document on nuclear security activities in the country [13]. As part of Ghana's INSSP, the Nuclear Security Support Centre was established with support from the IAEA. The Centre is part of a network of Centres of Excellence established globally to training, technical support for detecting and responding and coordination for nuclear security events. However, major challenges exist till date in the effective running of the Centre; inadequate human and financial resources limits the centres' ability to provide technical Support Services for lifecycle equipment management and Scientific Support Services for the prevention, detection of, and response to nuclear security events.

Additionally, frontline boarder officers (the Customs and Immigration Units) are constantly given training and have been supplied with radiation monitoring devices - Pagers and Identifinders. This is to enable them detect at first hand any radioactive material that comes through the Airport, habours and the over 50 land entries points into Ghana.

In 2014, Ghana signed a material support agreement with the United States Department of Energy's National Nuclear Security Administration (NNSA) Office of Radiological Security (ORS) to enhance and maintain the control and security of radioactive sources throughout the country in and out of regulatory control and identify and confirm all Nuclear and Radioactive Materials currently in use in Ghana. The project successfully to reconcile to a large extent the Regulatory Authority Information System (RAIS) data on radioactive sources to those being used by the associated facilities. It also created some awareness for on the need for nuclear security culture in facilities holding nuclear and radioactive materials.

A national radiological emergency response plan and procedures have been developed and published under the auspices of the National Disaster Management Organisation [14]. The plan includes identification of stakeholder organizations, definition of duties, lines of authority and responsibility, logistics, infrastructure, procedures and resources needed for response to nuclear security incidents. Support to local responses through the provision of resources such as personnel, advice, experts, equipment etc. are available. The integration of the

response plan with the national radiological emergency response plan is being considered to cover: Detection and response; Verification of presence of nuclear/radioactive material; Communication between involved organizations; Characterization of safety situation; Obtaining nuclear forensics support; Securing nuclear/radioactive material; Transporting nuclear/radioactive material; Storage of nuclear/radioactive material; Making public announcements and Determining future action. However, this plan and its procedure need major amendments since the landscape of nuclear security as changed drastically since it was developed in 2010.

4.1. Major Developments

- Progress on Ghana's Nuclear Laws and Regulations
- Improving Security and Control
- Progress on International Cooperation

4.2. Major Challenges

- Slow pace in the drafting of Regulations and guides

4.3. Remaining Gaps

- No force-on-force exercises.
- Building Ghana's nuclear cyber security
- Promoting nuclear security culture

5. RECOMMENDATIONS: THE WAY FORWARD FOR IMPROVEMENT

Whiles Ghana has made substantial gains in its nuclear security, through improvements n legislations, security and control, security culture improvement and cooperation. There's exist room for improvement in the following areas;

- Improving Security and Control
- Fast tracking the development of regulations.
- Improving Cyber Security Requirements at Nuclear Facilities
- Bolstering Nuclear Security Culture
- Combating complacency: Ghana needs to take further steps to prevent complacency, including: regularly reviewing nuclear security practice and systems, conducting self-assessments, and compiling lessons learned from real incidents and security exercises.
- Conducting realistic performance tests will help strengthen security culture for guards and other employees who witness the seriousness with which security risks are addressed, and see plausible ways the security system might be breached.
- Strengthening Greater Cooperation
- Nuclear Security Support Centre into a Centre of Excellence for Nuclear Security in the region.

REFERENCES

[1] Addo, P. (2006). Cross Border Criminal Activities in West Africa K. Accra: KAIPTC.

[2] Agalga, R. (2015). Nuclear Security Detection and Response Measure in Ghana.

[3] [Al Jazeera Centre for Studies. (2013). Terrorism and Transnational Crime in West Africa.

[4] Alexandre, M., Mogaka, S., & Verjee, N. (2015). The Challenge of Stability and Security in West Africa. Africa Development Forum series. Washington, DC: World Bank. Washington, DC: World Bank; and Agence Française de Développement. © World Bank. https://openknowledge.worldbank.org/handle/10986/22033 License: CC BY 3.0 IGO.".

[5] Center for Nonproliferation Studies (CNS). (2016). Global Incidents & Trafficking Database 2013-2016. Nuclear Threat Initiative.

[6] Center for Nonproliferation Studies (CNS). (2017). CNS Global Incidents and Trafficking Database, tracking publicly reported incidents involving nuclear and other radioactive materials, 2016 Annual Report. Nuclear Threat Initiative.

[7] FATF. (2013). Terrorist Financing in West Africa.

[8] IAEA. (2011). Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5). Vienna: IAEA.

[9] IAEA. (2012). NUSIMS COUNTRY PROFILE: NSA2, Ghana's Country Profile.

[10] IAEA. (2014). African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology, Fostering Nuclear Science and Technology for African Development. International Atomic Energy Agency Department of Technical Cooperation Division of Africa.

[11] IAEA. (2014). Establishing a National Nuclear Security Support Centre. Viena: International Atomic Energy Agency.

[12] NADMO. (2010). National nuclear and radiological emergency response plan. Ghana,. NADMO.

[13] Odoi, H. C. (2004). Reactor core conversion studies of Ghana research reactor – 1 and proposal for addition of safety rod. University of Ghana.

[14] Parliament of Ghana, 2015. (n.d.).

[15] Podvig, P. L. (2011). Global nuclear security: building greater accountability and cooperation. New York; Geneva: UNIDIR, 2011: UN Institute for Disarmament Research.

[16] Salihu, N. (2015). The Center Can Hold: Towards A Regional Approach to Combating West Africa's Terrorists,. KAIPTC Policy Brief.

[17] Zhang, H. (2016). China's Nuclear Security: Progress, Challenges, and Next Steps. Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School.