



PHYSICAL PROTECTION SYSTEMS AND MEASURES FOR NUCLEAR MATERIAL AND NUCLEAR FACILITIES IN UGANDA

BY

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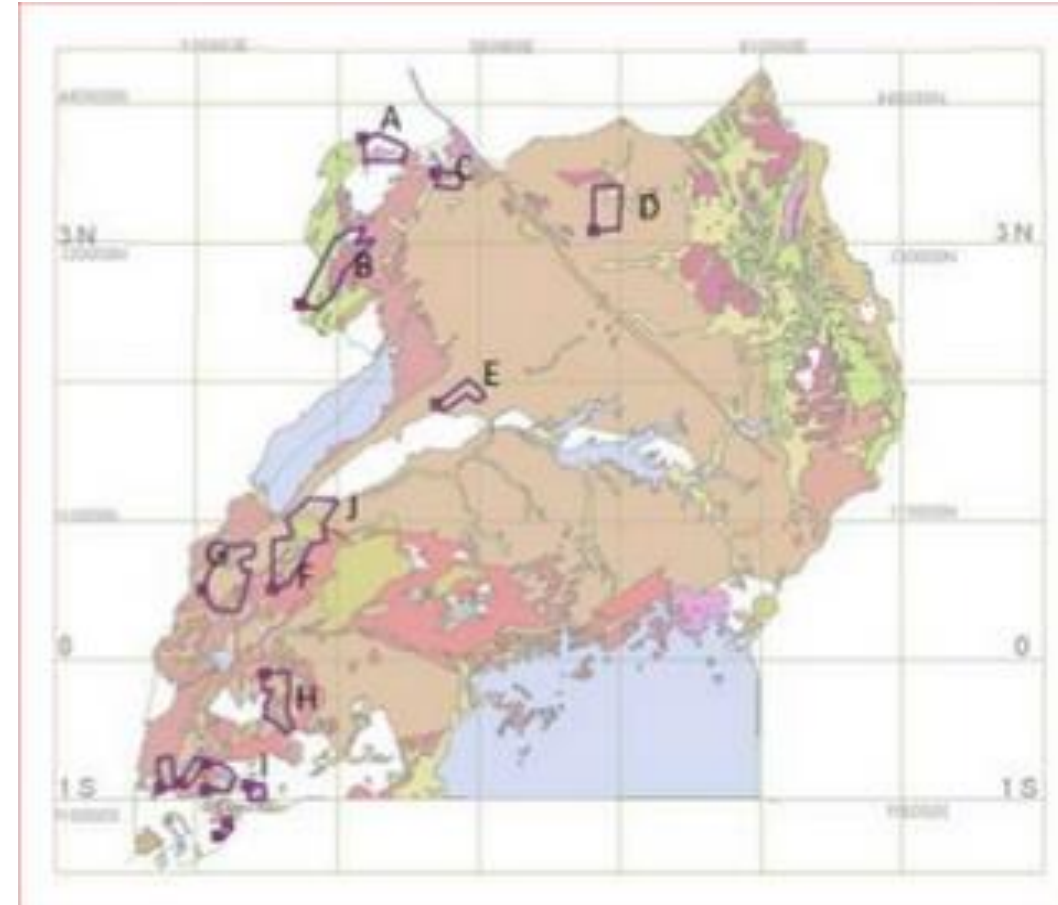


Presentation Outline

- Introduction
- Past incidences in Uganda
- Current status of physical protection systems and measures
- Objectives of the paper
- Physical protection systems and measures
- Recommendations
- Conclusion

Introduction (1/2)

- ❑ Uganda is currently undertaking Uranium explorations
 - Over 30 targets identified
 - 10 targets prioritized for follow up
- ❑ There are a number of mining and mineral extraction taking place in Uganda such as,
 - Phosphate mining
 - Copper mining
 - Gold, etc



Introduction (2/2)

- ❑ Uranium mining is neighboring countries of DRC and URT
- ❑ A decommissioned research reactors DRC.
- ❑ The border points are porous with limited detection measures



Past incidences in Uganda (1/2)

1. Illicit trafficking

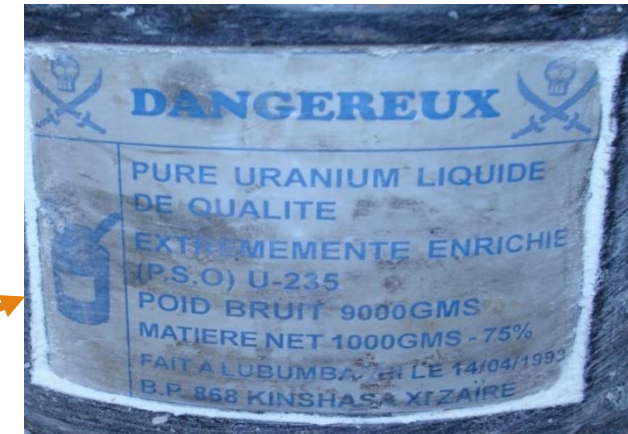


2015: URA impounded suspicious yellow cake



May 2003: Radium-226 source (GWT~ 15 Kg, diameter ~ 9 cm) impounded by Police but later went missing.

March 2002: Cobalt 60 source (GWT~50–60 Kg) was impounded by CID



In October 2008, UPF recovered a source of about 1 kg being sold as Highly Enriched Uranium (HEU) at a cost of \$20m

Past incidences in Uganda (2/2)

2. Lost radioactive sources

- ❑ Two Cs-137 sources found missing at KCCL
- ❑ Discovered through routine inspection
- ❑ Reported on ITDB
- ❑ Investigations on-going



Current status of physical protection systems and measures In Uganda.

- ❑ There is no feasible legislative framework
- ❑ The country is in preparation to include nuclear energy in the energy mix by building a nuclear power plant of 1000MW by 2031
- ❑ There are still porous border points
- ❑ Limited skilled personnel and detection equipment

Objectives of the paper

Identify the gaps in the existing physical protection systems in the country

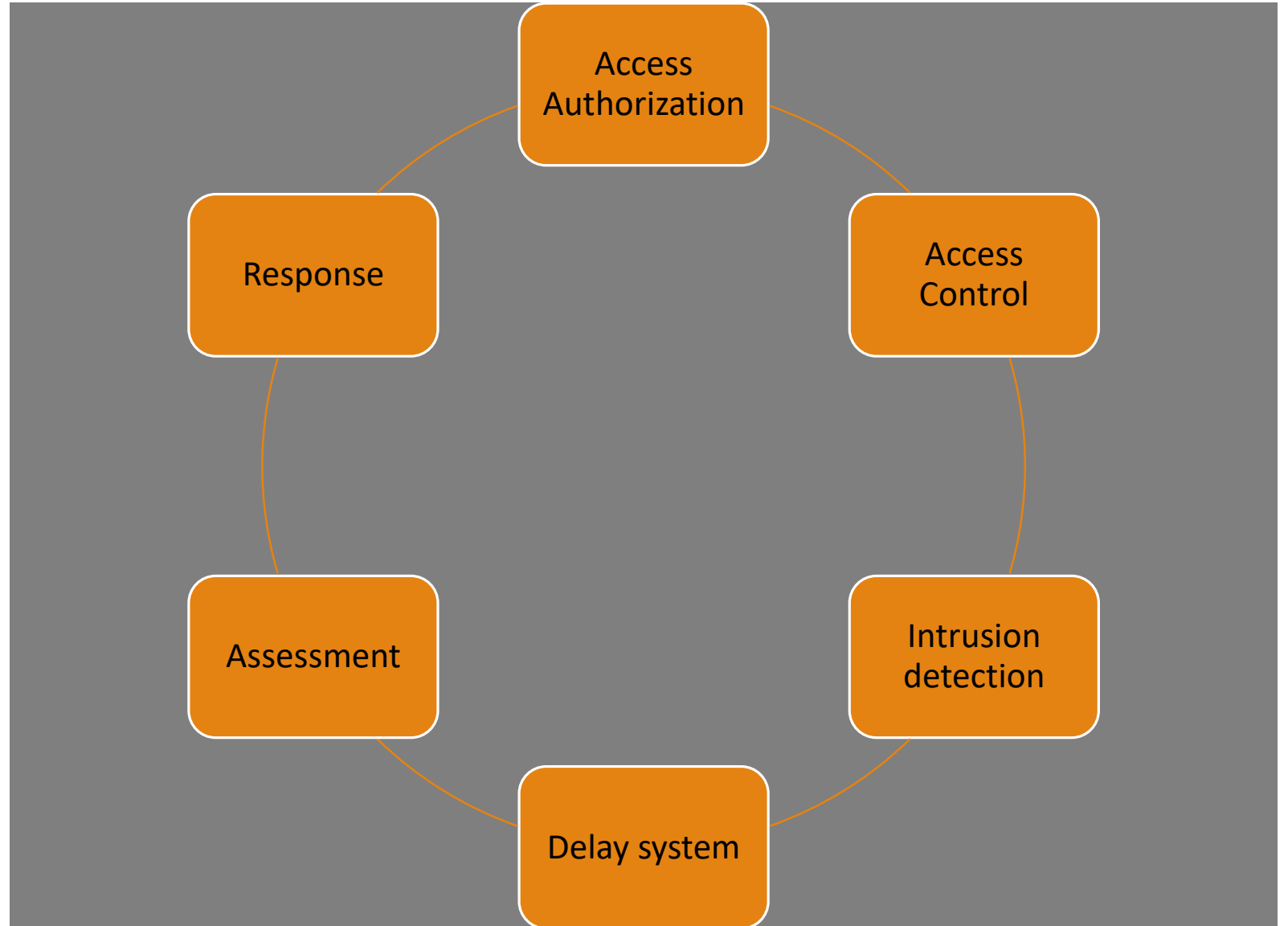
Provide the expected physical protection systems in the country

Provide guidance to AEC and stakeholders on their respective roles

Physical Protection Systems and Measures

- ❑ These are defined as, “the integrated set of physical protection measures intended to prevent the completion of a malicious act”.
- ❑ The PPS should be effective against both sabotage and unauthorized removal.
- ❑ The PPS must be designed with the following adequately answered
 - What must be protected?
 - What must be protected against?
 - how much protection is enough?

Components of a PPS



Access Authorization

This refers to, “the administrative processes that are used to determine unescorted access to either the nuclear material or sensitive information or both”.

It Involves;

- ❑ Escorted access to the security zone
- ❑ Granting access to Individuals who are known to be;
 - qualified and trained,
 - trustworthy,
 - reliable and,
 - have operational need.
- ❑ Nominations, vetting and Periodic review of the terms of operation.



Access Control System

This is defined as, “systems designed to control the movement of people or nuclear material in and out of the security zone”.

It involves’

- ❑ Physical access controls e.g. doors, walls, fences,
- ❑ Identification factor e.g. a key with PIN or biometric system.
- ❑ Easy Identification of personnel using special colours or badges or tags



Intrusion Detection System (IDS)

This is used to intercept an adversary from accomplishing the malicious act.

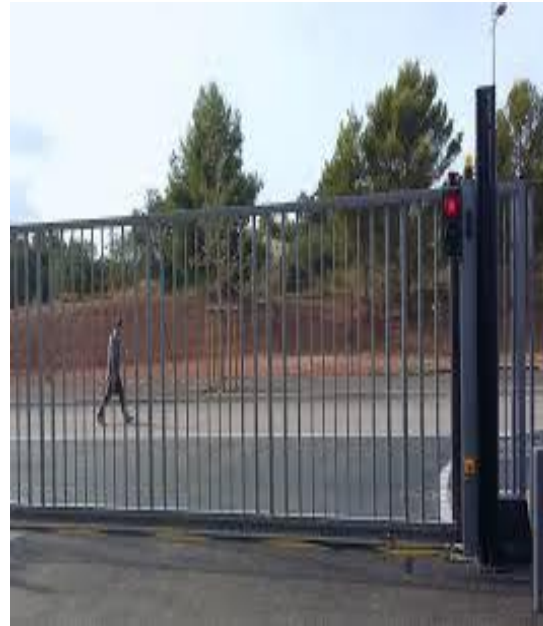
The IDS comprises of ;

- ❑ exterior and interior intrusion sensors,
 - ❑ motion sensors Video alarm assessment,
 - ❑ entry control & alarm communication system.
 - ❑ offsite or onsite monitoring station
- a) Alarms should include both visible and audible alarm signals
 - b) A battery backup or UPS is needed for the alarming system.
 - c) CAS should be secured with limited access



Delay Systems

1. This is used to hinder an adversary from accomplishing the malevolent act.
2. The main purpose is to slow down the actions of the adversary.
3. Delay can be accomplished by;
 - using security force,
 - physical barriers,
 - high security door locks.
 - Incorporating multiple layers



Assessments

This;

- ❑ Identifies the cause for an alarm and also
- ❑ Initiates the appropriate response.

Assessment can be accomplished through;

- ❑ Physical checks from personnel or
- ❑ Monitoring of video images from the cameras.

Personnel who perform assessments must be properly trained, trustworthy and reliable.



Assessments

- ❑ The Video coverage of each sensor should provide assessment capability.
- ❑ The video should have sufficient camera resolution.
- ❑ Use of the Digital Video Recorder (DVR).
- ❑ Alarm and video communication cables/lines need to be wired through the metal piping.



Response (1/2)

This is to stop an adversary from accomplishing the malevolent act.

The security plan should include;

- A response plan
- Responsibilities of the onsite or offsite response officers.
- The recovery plan.



Response (2/2)

Key areas of concern for response include;

- ❑ Facility details
- ❑ Multiple ways to communicate
- ❑ Use of authentication codes.



Recommendations

- ❑ 1. Amendment of the Atomic Energy Act, 2008
- ❑ 2. Develop Relevant Regulations
- ❑ 3. Develop practice specific guidelines
- ❑ 4. Installing detection equipment at the border points
- ❑ 5. Training of personnel

Conclusion

Uganda currently has limited Physical Protection Systems and Measures and thus is vulnerable to mainly illicit trafficking and other malicious acts.

Implementation of the suggested ideas in this will greatly enhance Nuclear Security in the country that will ensure that the people and the environment are protected from the dangers of ionizing radiation.

Once I convey Special thanks to the IAEA for the continued support to Uganda inform of expert missions, workshops, trainings, etc.

FOR GOD AND MY COUNTRY

**Thanks for
Listening!!**

