

International Atomic Energy Agency

# **Physical Protection Laboratory Roles and Function in Strengthening National Nuclear Security Strategy in Malaysia**



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## INTRODUCTION



The Atomic Energy Licensing Board (AELB) seek to strengthen the capabilities and knowledge in nuclear security through the enhancement of roles and functions of our national Nuclear Security Support Centre (NSSC) with the support and cooperation from the International Atomic Energy Agency (IAEA). Through this effort and cooperation, a Physical Protection Laboratory for Radioactive Sources facilities was established at the AELB's Headquarters (the "Laboratory"). The laboratory is expected to expand Malaysia's NSSC capabilities in providing better and practical training on physical



protection for authorised facility.

## **AIM & APPROACH**

The laboratory is equipped with nuclear security instruments to fulfil the objectives of the physical protection system (PPS) in preventing sabotage and/or theft of nuclear materials and other radioactive materials at the facility.

The installation at the laboratory will provide practical and hands-on guidance in order to accomplish nuclear security objectives either through deterrence or a combination of detection, delay and response mechanism.



### **Magstripe Card Reader**

readers use secure, bi-Pseudo-Random supervised directional communications between the multiNODE controllers and their associated readers. • Can be used as programmable status indicators in conjunction with up to 99 card commands initiated from the keypad

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## **PHYSICAL PROTECTION LABORATORY FACILITIES**

### **Fingerprint Reader**

 Capacitive fingerprint scanners generates an image of the ridges and valleys(shape of fingerprint) which the capacitor use electric current to generates the image It made up of one or more semiconductor chips containing an array of tiny cells where each cells includes two conductor plates covered with an insulating

- The cells are tiny and smaller than the width of one ridge on a finger
- **Proximity Sensor**
- Proximity sensor able to detect the presence of nearby objects without any physical contact • This sensor emits an electromagnetic field or a beam of electromagnetic radiation and looks for changes in the field or return signal

#### **Double Push Panic Button**

 Suitable for Grade 1 Installations Indicator to show activation Electronic device designed to assist in alerting somebody (usually the Emergency Services) in emergency situations



### **Vibration Glass Break Sensor**

• A vibration glass break sensor is a sensor used in electronic burglar alarms that detects if a pane of glass is shattered or broken. Most glass break sensors function by using an audio microphone that recognizes the frequency of broken glass. If the right frequency is detected, the alarm sounds.

#### **Palm Vein Reader**

• Palm vein recognition is a biometric authentication method based on the unique patterns of veins in the palms of people's hands.

• Palm vein recognition systems, like many other biometric technologies, capture an image of a target, acquire and process image data and compare it to a stored record for that individual.

• Palm vein scanning systems, like those for finger vein ID, use a technology based on the use of near-infrared rays and the way hemoglobin in the veins reacts to them.



#### **Proximity Card Reader**

• The Javelin S870 uses secure, bi-directional. MCLP pseudo-random supervised communications to the door controller. Both the card reader and cable are supervised, and an alarm will be generated if the card reader is tampered with or communications lost.



## **IRIS Reader**

• IRIS reader measures the unique patterns in irises, the colored circles in people's eyes

• It operates by illuminating the iris with invisible infrared light to pick up unique patterns that are not visible to the naked eye • The final result is a set of pixels containing only the iris(exclude eyelashes, eyelids and spectacular reflections that typically block parts of the iris) that will analyzed later to extract a bit pattern that encodes the information in the iris

#### Micro Bend Sensor

 Microbend modulator detect changes in external perturbation Intensity modulation induced by microbending in multimode fibers is considered as a transduction for detecting mechanism environmental changes This changes includes pressure, temperature, acceleration, magnetic field and electric field

#### **PIR Sensor**

• Passive Infrared (PIR) sensor detect change in the energy level emitted by the target • It also measures infrared(IR) light radiating from objects in its field of view • It varies depending on the temperature and surface characteristics of the objects in front of the sensor

Time and date of inci-

dent is recorded

#### **Mono-Static Microwave Sensor**

• The detection zone is a volumetric part of the perimeter site and any intruder's movement in which generates an alarm. The sensor provides the adjustment of the length from 5 m to 60 m.

#### **Bi-Static Microwave Sensor**

- The sensors are intended for the protection of direct perimeter sectors.
- The principle of operation is based on generation of an invisible volumetric detection zone between the transmitter and the receiver. When the intruder is crossing the detection zone,
- the receiver registers its alteration and generates the alarm.

#### **Photo Beam Sensor**

- This equipment used to discover distance, absence or presence of an object by using light transmitter that are often use infrared and photoelectric receiver
- A through beam arrangement consists of a receiver located within the line-of-sight of the transmitter
- · Object is detected when the light beam is blocked from getting to the receiver from the transmitter



Handover to authorities for onward

action as per SOP





## Task Begin Complete Action Adversary Task Time Delay -**PPS Time Required** -**First Alarm** nterrupte Detect Respond

The laboratory is expected to compliment the Authorised User Training programme offered under NSSC Malaysia and can be used to offer demonstrations of the operation, hands-on training, maintenance and practical exercises on working principles of physical protection equipment. Malaysian's NSSC, through enhancement of this technical capabilities at the Laboratory intends to host national and/or regional training courses on physical protection introduction and security measures training for Regulators, Operators/licensees, Security Personnel and University academics involved in Physical Protection application and Studies.