

## **Complementarity between physical protection system and nuclear security with the ID number 124**

Abdelouahed Chetaine, A. Saidi , O. kabach and T. Bouassa

Faculty of sciences university Mohammed V rabat Morocco.

E-mail contact of main author: [chetaine@fsr.ac.ma](mailto:chetaine@fsr.ac.ma)

**Abstract.** A physical protection system is the integration of people, procedures, and equipment used to protect assets or facilities against theft, sabotage, or other malicious human attacks. The PPS functions are detection, delay and response.

As Defined by the IAEA, Nuclear security is: The Prevention and Detection of, and Response to, theft sabotage unauthorized access illegal transfer theft , Sabotage , Unauthorized access, Illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated other radioactive substances or their associated facilities. These objectives can be achieved with equipment, methods and human behavior that we can trust.

The objectives of the nuclear security and physical protection system is to protect nuclear facility or nuclear material against threats and terrorist. The equipment is not sufficient it must be completed with nuclear security and nuclear security culture to achieve these objectives.

The PPS and nuclear security can achieve the protection of nuclear facility and nuclear material if they complete each other's and fill the gaps.

**Key Words:** nuclear security, Physical protection System.

## Introduction

As Defined by the IAEA , Nuclear security is: The Prevention and detection of, and response to, theft sabotage unauthorized access illegal transfer theft , Sabotage , Unauthorized access , Illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated other radioactive substances or their associated facilities. These objectives can be achieved with equipment, methods and human behaviour that we can trust.

Nuclear security starts with understanding what represents a potential target for an adversary, attempting to define how the adversary might threaten this target, and producing appropriate measures to meet the threat. The IAEA recommends the “Design Basis Threat” (DBT) methodology as a tool to design appropriate security measures. In essence, DBT describes the capabilities, intentions, attributes, and characteristics of potential adversaries who might attempt malicious acts

A physical protection system (PPS) integrates people, procedures, and equipment for the protection of assets or facilities against theft, sabotage, or other malevolent human attacks.in this paper we will present the complementarity of the two system to achieve an effective nuclear security and mitigate a threats.

## Physical Protection Systems (PPS)

Physical Protection Systems (PPS) are intended to protect assets and facilities. A PPS is composed of people (e.g., a response force), procedures (e.g., alarm assessment), and elements (e.g., sensors, and locks) that contribute to protecting assets against malevolent human operations such as theft and sabotage.

The PPS System must be designed in order to answer the following questions

What I should protect?

Against whom I must protect.

The importance of what I have to protect.

A PPS performs three functions: detect, delay, and respond. The PPS detects a threat (e.g., an intruder) by observing and identifying it. Elements in the PPS delay the threat by increasing the time needed for it to reach its target, which provides enough time for interruption. The PPS responds by intercepting and neutralizing the threat. A state-of-the-art PPS includes sophisticated sensor systems, automated responses, and modern communication and information technology.

## Nuclear security

*The nuclear security definition is “The prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities”.*

– Nuclear security focuses on the prevention of, detection of, and response to, criminal or intentional unauthorized acts involving or directed at nuclear material, other radioactive material, associated facilities, or associated activities.

*Protection of people and the environment from malicious acts that could result in the exposure of the public to ionizing radiation.*

Basic Elements of Nuclear Security are **Prevention, detection and Response.**

**Prevention** includes all such security measures that may serve either as deterrence or prevent any unauthorized access to a protected nuclear facility and associated facilities.

**Detection** includes all such security measures that help in detection of any unauthorized access to a protected nuclear facility.

**Response** is the security strategy used to defeat an adversary by preventing it from accomplishing its tasks either by containment or by neutralization.

The role of nuclear security is to

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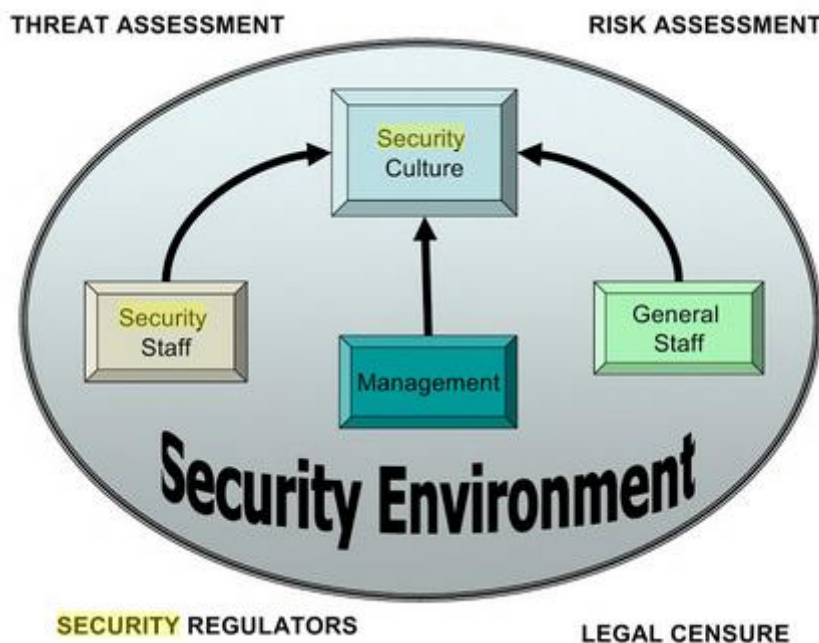
. Security culture is a subset of overall organizational culture

The threat of nuclear terrorism has been recognized as a matter of grave concern by all States. States also recognize that nuclear security in one State might depend on the effectiveness of the nuclear security regimes in other States.

There is an increasing need for appropriate international cooperation to enhance nuclear security worldwide.

Nuclear security culture is the assembly of characteristics, principles, attitudes and behaviour of individuals, organizations and institutions which serves as a means to support and enhance nuclear security.

Security culture plays an important role for the protection nuclear materials as any number of fences or intrusion detection devices. Security culture is the key element in our Physical Protection System against terrorism, and insider threats.



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### **Complementarity PPS and Nuclear security**

We already defined the nuclear security function as:

**Prevention** → **detection** → **Response**

While the function of the PPS are:

**Detection** → **Delay** → **Response**

The advantage of the PPS is that it has a detection system and a reply system that are adequate for each installation. These systems can be more effective if reinforced with a nuclear security culture and the REVENTION function. The fusion of the various functions leads to a more robust and effective nuclear security system

The nuclear security plays role to raise the awareness of human resources and to reinforce these capacities in order better to benefit from the detection and response equipment. The prevention, first element of nuclear security can be the key for the detection of insider threat. We know that the detection of insider threat is very difficult or sometimes impossible for the detection system.

The success of nuclear security regime is to make the workers and users of nuclear materials well aware of the danger that is exciting and which continues to increase with the motivations and capacities of internal or external terrorists

This can be done if a nuclear security culture is installed in each facility from the entrance to the vital area.

### **Conclusion**

A system or regime of nuclear security can only be effective if it has the necessary means for its proper functioning (staff, equipment and procedures). If we neglect human behavior, this system will be inefficient even if the most sophisticated equipment is available. To do this, we must pay attention to human resources in the same way as the equipment. Hence the role of nuclear security culture as a basis for an effective system.

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Et ceci a cause de son

Sustainable nuclear sec development

Nowadays; the use of nuclear energy and nuclear material is growing very fast and in many field

Ceci à cause de son rôle protecteur de l'environnement et du développement technologique.

Cette utilisation reste visée par les terroristes et les menaces qui ne cessent d'augmenter