

## **EFFECTIVENESS OF THE DESIGN AND IMPLEMENTATION OF A PHYSICAL PROTECTION SYSTEM AT A RADIOLOGICAL FACILITY**

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Useful applications of nuclear and radioactive materials in energy production, medicine, research and industry, to improve human lives around the globe is essential and continues to be in demand. There is a potential risk of it being use for the wrong purposes when it falls into the wrong hands such as terrorists' groups and this is a growing concern the world seeks to address by enhancing nuclear security. A deliberate act of theft or destruction against a nuclear and radiological facility could threaten public health through exposure to radiation. Physical Security Systems (PPS) are effectively employed to avoid or lessen loss of assets with great importance in various fields of interest such as the nuclear and radiological centers. The effectiveness of physical security systems is evaluated as the probability of a security system to detect and defeats an adversary along a given path. The PPS design permit the combination of protection elements working together to guarantee protection rather than regarding each security element distinctly. Most of these hospitals have in their facility a temporary storage unit where disused radioactive sources are kept. Hospitals that provide radiotherapy services, makes use of the radioisotopes  $^{60}\text{Co}$ ,  $^{137}\text{Cs}$  and  $^{192}\text{Ir}$ , or LINAC and X-ray machines. Enactment of the PPS design addresses the systematic and integrated securing of resources in anticipation of adversary attacks, rather than reacting to adversary actions after they occur. An Integrated Physical Protection System (IPPS) is necessary to consolidate of all sub systems, sensors and elements related to protection system for an effective security environment of a radiological facility. Radiological and nuclear facility holding Category I and II nuclear materials is advised by IAEA to have a central alarm station to prepare against any sabotage or theft issues since any of these unauthorized actions could lead to a potential radiological health hazard to the environment. The security sub-systems that are often integrated into IPPS are, access control, intrusion detection, CCTV surveillance, emergency door monitoring system etc. The access control sub-system employs intelligent card readers and interfaces with the PC based central controller which is done through some form of communication network. This paper considers the basic and effective elements required for physical protection system for a radiological center. It will serve as base guidelines for the decision makers in the establishment of an effective physical protection for a radiological center. Integrated Physical Protection System features are put together and properly analyzed to help in making vital decision when securing a radiological facility. The designing and implementation IPPS help identify areas of vulnerability that can be remedied and practices that can be improved during the risk and threat assessment exercise.

### **REFERENCES**

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