

ENHANCEMENT OF SECURITY CULTURE USING A PREDICTIVE MODEL TO PREVENT SABOTAGE AND THEFT AT RADIOLOGICAL FACILITIES

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With the increase in the application of nuclear technology around the globe, there is a need to institute predictive and prudent measures at nuclear and radiological facilities and activities to adequately and effectively protect their materials from incidents and adversaries.

This implies that the human factor and security culture as defined by the International Atomic Energy Agency (IAEA) in the Nuclear Security Series No. 7, plays a crucial role in the entire nuclear security architecture of any organisation or state. Physical Protection Systems for nuclear facilities and radiological sources are designed to protect and/or prevent possible malicious acts.

The dynamic significant threat environment has evolved such that, relying on the perception that certain nuclear materials are self-protecting, can lead to the sabotage and unauthorized removal of facility assets by insiders. These assets are manned by management members and employees who are trained and trusted to maintain procedures and practices required for the routine operation and development of the associated facilities and activities.

The methodological approach utilized in this research as a predictive potential insider model adapts initial data from the threat group table of the hypothetical facility, Anshar Radiation Source Calibration Laboratory and National Repository (RSCL).

The initial state vector values adapted from the threat group table with a high, medium and low potential insider attribute analysis are; 0.42% 0.33% and 0.25% respectively of the employee population at RSCL.

This methodology is designed to quantify the likely outcome of an implemented internationally recommended security culture model to guide management of nuclear and radiological facilities in preventing sabotage and theft at nuclear and radiological facilities.

Over a 20 year period (ie. trials), involving an annual International Atomic Energy Agency (IAEA) recommended self-assessment of the facility security culture, a steady state of 0.38%, 0.35% and 0.27% of the employee population indicating a fairly balanced security system.

The obtained steady state will aid the managers of RSCL to acknowledge and make the necessary changes to the knowledge training development of personnel, the controlled authorized access granted to the employees at various divisions of the facility and control the level of authority granted to the employees.