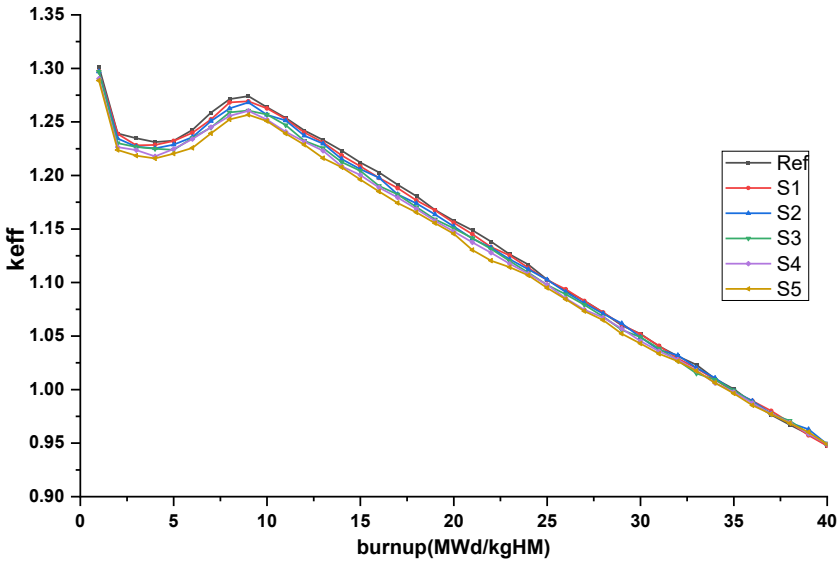

Fig. 1. Dependence of multiplication factor from fuel burnup

PHYSICAL PROTECTION SYSTEM EFFECTIVENESS EVALUATION MODELS: CHALLENGES

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Physical protection systems (PPS) are the combination of systems used to protect valuable facilities or entities from theft, sabotage or any malicious human activities. These valuable facilities may include nuclear power plants, airports, military installations, banks and other related facilities. These are facilities with high consequential effects on society if malicious activities were carried out successfully on them. Malicious activities, which may include sabotage, theft, terrorism, hostage-taking, the release of a harmful substance into the environment, and other illegal activities by human. The PPS has the primary functions of detection, delay and response to an attacking adversary. These functions are carefully design to meet some special needs of the facility and they are usually evaluated through analytical models for effectiveness after been designed. This work examined the challenges faced by the PPS elements from mostly non-analytical factors such as human reliability, national security culture, training and knowledge, and such as economy and ecology.

The work highlights different PPS evaluation models, then EASI model input parameters were used to explain these challenges as they relate to PPS effectiveness. The relationship between these factors and the PPS effectiveness were established to be in a mixed of direct or indirect proportions, this is mostly vivid in newcomer member societies. Solutions, recommendations and further insights were provided by the researchers.

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ENERGY TRANSFORMATION AND ACCUMULATION IN SOLIDS, IRRADIATED BY CHARGED PARTICLES

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All observed phenomenon under irradiation are determined by processes of energy transformation in matter, depended on: (1) initial properties of matter; (2) irradiation parameters (3) characteristics of irradiation medium. Our universal scheme of transformation and accumulation of energy in solids under all types of irradiation is presented in Fig.1.

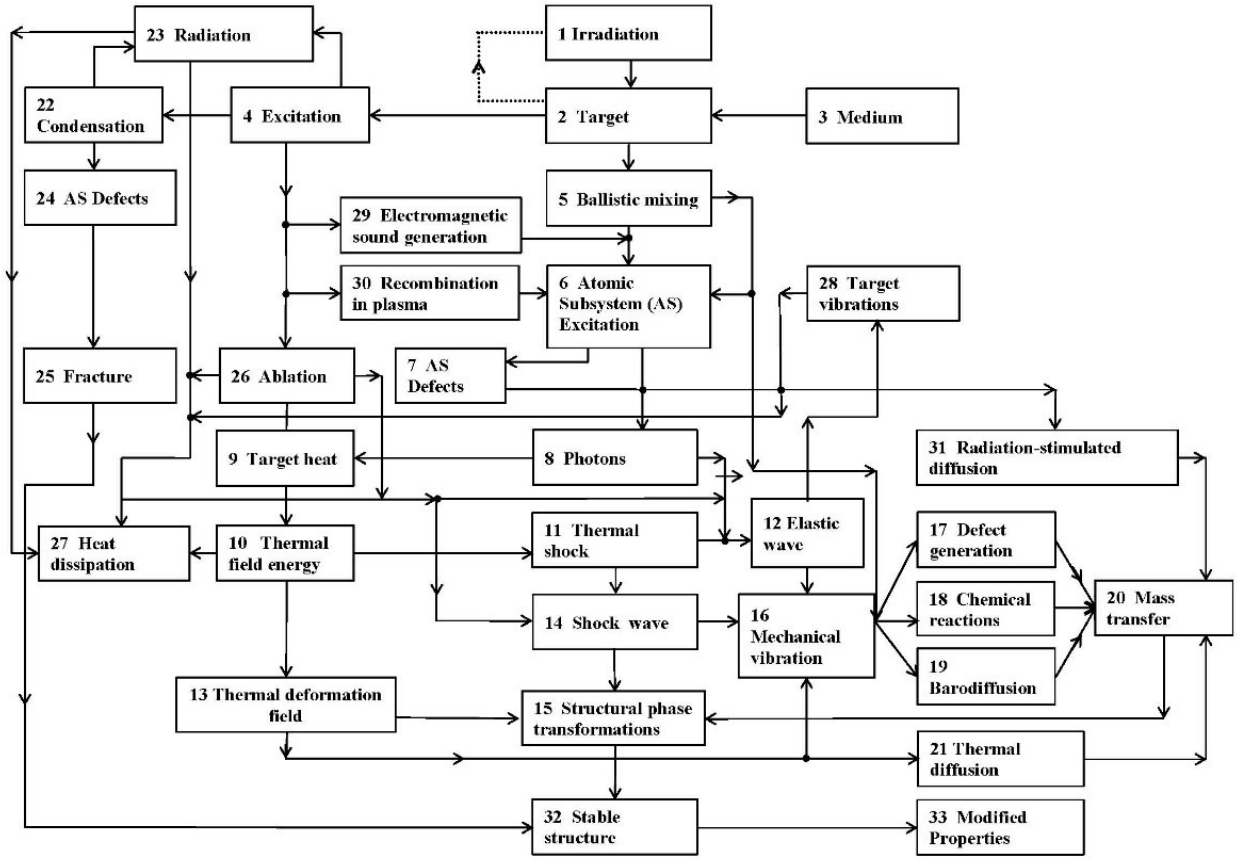

Fig.1. Scheme of transformation and accumulation of energy in solids under all types of irradiation

Radiation-stimulated processes, structural and phase damages, that cause the observed modifications of all properties of solids, are analyzed in 33 blocks with its detail explanations of energy redistribution in temporal sequence from beginning of irradiation till formation of stable structures.

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