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HUMAN FACTORS EVALUATION IN OPERATORS WITH ATTENTION TO INSIDER THREAT DETECTION

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ABSTRACT

A key concept in nuclear reactor operation is that nuclear security is the result of interactions between human, technological and organizational factors. Nuclear Standards Regulatory understands how human factors from psychological, physiological, behavioral and emotional origin can affect the reactor security. For that reason, reactor operators are submitted to rigorous evaluations every year. When conducting case studies during these sixty years of IEA-R1 reactor operation, three of them related to security illustrate the concern about this issue: Case 1- Contract workers tried to steal lead used in the shielding of water treatment system. Case 2- Operator suffered stress in traffic in his going to the reactor facility; when performing test in the emergency cooling system for reactor start up, he didn't close a valve completely; changing the pool water technical quality causing a week delay in the reactor operation. Case 3- During fueling the reactor core, operator realized that the fuel element assembly was inverted. In the investigation verified that assembler man´s father had passed away three weeks before the fuel element assembling. There was sabotage speculation by the manager. This multidisciplinary work aims to include human factors of psychological and behavioral origin as preventive and protective measures of the reactor physical protection system, focusing insider threat detection. Technologies associated with neuroscience and psychological assessments such as: Face Reader, Analogue Visual Mood Scale and Back Depression Inventory; allows the operator evaluation in the facility. However, problems like described in the case studies should be elucidated. Insider threat is one of the biggest concerns of globalized society. Through the human and technology interaction, several research studies have been carried out to ensure that preventive and protective measures are taken to minimize, mitigate and mainly prevent insider actions. Understanding the role of nuclear security in keeping its facilities protected, this research proposes to study interface between man and technology aims the insider threats detection. So the technology will allow the possibility of detection to be made in preventive and mainly protective way. Through the philosophy of defense in depth technology will prevent a possible insider to access a vital area, detecting an insider before the start of malicious act. For example, technology would detect the German Wings-FLIGHT 9225 pilot wouldn´t have the psychological conditions to conduct the airplane that day. While advanced data analytics techniques can help organizations objectively evaluate insider behaviors and enhance their security posture, they are not enough. Organizations should combine the use of technology with well-defined policies, consistent communication and training, and routine due diligence. Standardizing on boarding, background screening and employee separation procedures will also offer opportunities for mitigating harmful activities. This work will be presented in Poster Session.

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