ПУГР. При этом для надежной изоляции радионуклидов, содержащихся в материалах и конструкциях захораниваемых реакторных установок, прибегают к созданию дополнительных барьеров безопасности.

Искусственные барьеры безопасности на основы природных глин создаются, как правило, с помощью специально разработанной технологии бесполостного заполнения [2]. Однако такие барьеры безопасности могут быть подвержены внешнему негативному воздействию (техногенному или природному), что приводит частичному ухудшению их противофильтрационных и противомиграционных свойств.

Для восстановления целостности и работоспособности глиносодержащих барьеров безопасности целесообразно использовать методы, не приводящие к еще большей деградации барьерного материала. В связи с этим целесообразно рассмотреть электроосмотический метод осушения.

В работе показано, что эффективнее всего удаляется раствор, имитирующий грунтовые воды из ИББ при напряжении 31,8 В и расстоянии между электродами 40 мм. В этом случае линейная скорость движения влаги составляет 2,5 мм/мин. Это позволяет полностью осушить глиносодержащий барьер безопасности обводненный 70 мл раствора в течении (7-8) часов. Таким образом, электроосмотический метод восстановления глиносодержащих инженерных барьеров безопасности позволяет концентрировать влагу возле одного из электродов, тем самым осушая прилегающую область глины.

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## MODELING THE THREAT ASSESSMENT AND ADVERSARY INTERRUPTION

Opoku S.E., Amoah P.A., Izgagin D., Stepanov B.P.
Tomsk Polytechnic University 634050, Tomsk, Lenin Ave., 30
E-mail: opoku@tpu.ru

A comprehensive threat assessment considers actual, inherent, and potential threats. The Anshar Radiation Source Calibration Laboratory and National Repository (RSCL) is a hypothetical facility which has been adapted for this research and is located in an industrial area near an international airport outside of a city with a population of 750,000.

The industrial area is used for processing and packaging the main export products for the country. There are several residences and apartment buildings located within approximately 300 m to the southwest of the RSCL. There is a significant amount of criminal activity in the general area at night as reported by the security forces, due to its location and proximity to various commercial properties. On average, there are five cars stolen per year or vandalized in the immediate vicinity. To tackle this concern, state actors conduct comprehensive and credible threat assessments followed by appropriate actions to improve radiological security.

Threat assessment is the practice of determining the credibility and validity of a potential threat, and to acknowledge the probability that the estimated threat can be activated into reality. This study analyzes a hypothetical radiological research organization using modeling tools. The research evaluates three (3) facilities at the radiological organization and their Physical Protection System (PPS) to assess possible entrances and diversion. The three (3) major facilities being considered for this research at the RSCL are the Calibration Laboratory (F1), the National Repository (F2), and the Interim Storage facility (F3). The buildings allocated for these facilities are strategically spaced from each other to allow effective transfer of materials and also to support routine security response concerns.

The site security plan prepared by the stakeholders has considered the need for periodic threat assessment to be conducted to support the response team and maintain effective security onsite. This condition with initial probabilities of adversary attack as 0.26, 0.15 and 0.42 leads the scenario into a state of varying probabilities of threat at the three (3) facilities being considered; F1, F2 and F3 respectively. The research conducts several repetitive runs of the threat assessment process using the modeling tools, by considering different response elements that could potentially be added to the design to reach the desired response margin and overall system effectiveness. After thirteen (13) simulation event trials, a steady state is reached with final probability of adversary attack values as 0.60, 0.09 and 0.14 for facilities F1, F2 and F3 respectively. The several trials conducted and the steady state reached serves as a guide for facility managers to acknowledge and determine the resources required to control adversary attacks at the various facilities considered at the nuclear organization.

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

Shcheglova E.A., Amoah P.A., Izgagin D., Stepanov B.P.
Tomsk Polytechnic University Tomsk, Lenin Ave., 30
E-mail: eas81@tpu.ru

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.