PROJECTED NUCLEAR SECURITY ASSESSMENT OF ADVERSARY ULTIMATE LIMITATIONS

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A nuclear security conceptual projection assessment of the limitations improvised for adversary pathways at nuclear facilities has been researched on and discussed. A hypothetical facility, DaPaRay, has been chosen for this research. Various elements of risk assessment and a description of various adversary groups, whose main aim is often theft or sabotage or both, has been used to guide the definition of the scope of this research. In quantifying the risk, elements such as vulnerability, threat and consequence or impact of events were assessed for consideration. The adversary groups which consists of scenarios of external and internal (i.e. insider threat) capabilities, have been considered. A Security Risk Assessment Tool (SRAT) has been employed for this research. SRAT classifies the criticality of this research as important and the crisis response capacity as excellent, placing the threshold at a level 12. An Assessment of a Projected Adversary Ultimate Limitation (PAUL) of the inherent risk and residual risk showed that about 50% of adversary issues considered had an unrealistic and doubtful probability, an unlikely or very unlikely descriptor mode of occurrence, with minor or no serious injuries to staff, and with a minimal loss or damage to facility assets, and little or minimum delay, in the next 2 to 5 years of the facility's routine operation. About 30% of adversary issues had a high or expected probability of occurring with a very likely or likely descriptor mode of occurrence with an impact of severe injuries or even death of staff, major or complete destruction of facility assets leading to a severe disruption or closure of the facility, which could occur any day or within any week. About 20% of the adversary issues considered had a reasonable probability of occurring with a moderately likely descriptor mode of occurrence, which had an impact but of non-life-threatening injury to staff members, with a loss or damage to some assets, causing some delays and disruptions once a year or once a month. The percentages obtained are to be used in forming a markov chain which comprises of a combination of probabilities and matrix operations. A long run distribution vector is expected to be generated from the transition matrix that will be formed from the transition diagram of the probability tree. The resultant distribution vector will aid nuclear security researchers in projections related to adversary activities and their limitations. The projected adversarial activities are therefore expected to be met with the respective facility specific designed response.

REFERENCES

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