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Performance Testing in the Secure Transport of Nuclear, Radiological, and other High-Risk Materials

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A long established methodology for determining the effectiveness of an overall physical protection system (PPS) is through a healthy and robust performance testing program. Performance tests are vital because they provide essential information used in the determination of asset risk and the analysis of protection effectiveness. By establishing and verifying detection, assessment, response, interruption, and neutralization data, one can determine baseline protection effectiveness and consider upgrade scenarios and improving effectiveness. Performance testing also addresses the needs of multiple stakeholders, including the vulnerability assessment teams, site/facility personnel, and safety, and provides management with an independent, objective assessment of overall physical protection systems.

Performance testing can be applied to any layer of PPS at a fixed site or any mode of transport. In an example of road transport by box truck, we can test one layer of a PPS. In this example, we will focus on the delay associated with breaching times of different types of tie down mechanism used to secure containers while in transit. This test will be limited scope in nature and will use three different methods of breaching (mechanical, ballistic, and explosive). During the test, we will attempt to breach the tie down chains and the locking mechanism multiple times with each method.

At the conclusion of the test, objectives and evaluation criteria will be analyzed to ensure the system is performing as required, deficiencies are identified, and stakeholders are provided with feedback/results. For example, the results from this particular set of tests can be used to determine figures of merit associated with delay mechanisms to determine response time needs in relation to the delay associated with breaching the tie downs.

This paper and presentation will discuss adapting fixed facility performance testing plans to transport, best practices for transport performance testing, and how to implement analyses in to protection strategies.

State

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