

Systems-Based Vulnerability and Risk Assessment

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Abstract

Identifying potentially high consequence components within critical infrastructure systems, assessing their vulnerabilities and the consequences of attacks on those components, is crucial to their defense from terrorist attacks. For relatively well defined infrastructures that are either primarily fixed and physical (chemical/petroleum plants or nuclear power stations) or distributed but with a limited number of focused nodal assets (water systems or the electrical grid), approaches based on asset centric risk assessment work relatively well. Such approaches are less effective, however, for systems that have numerous redundant pathways within a vast, extended, highly integrated process that operates incessantly throughout the nation and the world. In cases where the infrastructure itself can be used as a vehicle to deliver weapons, e.g., infective agents and toxins, the needs are even more complex. The postal & shipping system, transportation, production agriculture and the food supply chain are primary examples of broad, systems-based infrastructures where elements or components of the systems are of greater concern than a small number of physical assets. This talk will address research efforts to develop scalable approaches that can be employed for systems-based consequence, vulnerability and risk assessment, utilizing examples from food and animal production agriculture models.