Nuclear Threat Intelligence, Surveillance, and Reconnaissance

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The National Security Strategy states that the greatest threat to the American people is "the pursuit of nuclear weapons by violent extremists and their proliferation to additional states." The Global Nuclear Detection Architecture (GNDA) addresses a key portion of that threat by focusing on detecting nuclear and radiological materials that are out of regulatory control within permissive operating environments. However, the force protection requirements of the Department of Defense (DoD) range across a wider mission space from permissive environments, where nuclear and radiological materials can be monitored while under regulatory control, to hostile environments where nuclear and radiological materials exist in defiance of international regulations and agreements. This wider range of operating environments and the inherent physics limitations on the range of radiation detection pose great challenges to radiation detection-focused approaches to nuclear threat detection. Consequently, DoD is in the process of defining an intelligence, surveillance, and reconnaissance approach to countering nuclear threats that considers the observable signatures of all elements that comprise a potential threat; information, funds, people, material, equipment, and infrastructure. This strategy represents a shift from radiation detection as the primary sensing modality to radiation detection as one of many sensing modalities, including the human dimension, with a heavy emphasis on data fusion. This presentation will describe the attributes of a layered sensing approach to nuclear threat detection, illustrate the approach with examples, define potential building blocks, and discuss technical challenges.