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Long Term R&D for Safeguards

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Within the Office of Defense Nuclear Nonproliferation Research and Development (DNN R&D), the Nuclear Weapons and Material Security Team conducts research to develop advanced detection and source technologies for the purposes of detecting and characterizing special nuclear materials (SNM); international safeguards and radiological source replacement; nuclear arms control treaty monitoring and verification; and supporting interdiction and nuclear security efforts across NNSA. Our safeguards-specific goal is to develop and demonstrate new technologies and capabilities to cooperatively quantify and track SNM in the nuclear fuel cycle and detect any diversion of these materials for illicit purposes. Our goals and objectives align with a technology goal of the International Atomic Energy's Long Term Strategy for 2012-2023 "to improve the Department's technical capabilities by making use of scientific and technological innovation, and to enhance its readiness to safeguard new nuclear technology and support new verification missions."Toward that end, we work closely with the US Department of Energy's Next Generation Safeguards Initiative and the US Support Program to meet their specific long term needs.

In this talk we will give a brief overview of current research efforts and specifically describe several helium-3 replacement technologies, advanced spent nuclear fuel characterization methods, and upcoming tags and seals technologies. We will present additional research into cross cutting enabling technologies such as advancements in detector materials, electronics, and sources, and basic physics measurements that support long term safeguards R&D.

Country or International Organization

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