

The Application of the Graded Approach to Physical Protection of Radioactive Sources in the United States

Development and oversight of security measures that account for the overall risk posed by radioactive materials requires integration of safety and security programs. Implementing a graded approach to security allows the U.S. Nuclear Regulatory Commission (NRC), along with our Agreement State partners, to ensure adequate protection without unnecessary burden. This allows the United States (US) to realize and take full advantage of the benefits of the various uses of radioactive materials. The NRC will present on its efforts to utilize a graded approach in the establishment of a strong regulatory framework to ensure the safety, security, and control of radioactive sources –from allowing exemptions from regulations for specific items, through sources and uses for which prudent management practices or existing safety requirements are sufficient, to the highest activity sources and practices that deserve the tightest control.

The US framework relies on various safety and security analyses, including threat, vulnerability, and consequence, to determine the appropriate framework and requirements for each circumstance. These analyses form the basis for the graded security for all civilian radioactive and nuclear material in the U.S. For example, sources that present minimal to negligible hazard, such as smoke detectors and gunsights, are exempt from licensing entirely for the end-user, while still other sources, such as those in robust devices, are subject to registration and notifications of transfers to the regulatory agency. For the majority of licensed civilian radioactive and nuclear material in the U.S. the physical protection measures can be found in 10 CFR Part 20, in paragraphs 1801 and 1802. Although, in short, these paragraphs state only that licensees must secure their material while in storage and that it must be under constant surveillance while in use –they do not specify exactly what means a licensee must use to accomplish those objectives. Thus, licensees must develop processes and procedures that are subject to inspection, to meet these objectives.

For other licensed material, and for specific modalities of use, additional (not replacement) requirements apply. An example of this is a well logging licensee who possesses a category 3 americium-241/beryllium source. This licensee must comply with the security requirements in 10 CFR Part 20, but also must comply with the additional requirements in 10 CFR Part 39 that are specific to well logging operations and, among other things, include prescriptive requirements for source control and security.

For sources or aggregated quantities of radioactive material that the U.S. has determined to be risk-significant, that is that meet or exceed the category 2 threshold, further requirements of 10 CFR Part 37 must be implemented by the licensee to ensure additional physical protection. An example of this situation is an industrial radiography licensee who possesses a camera (or multiple cameras) containing a category 2 iridium-192 source who must comply with 10 CFR Part 20, the additional specific safety requirements for radiography in 10 CFR Part 34 such as personnel wearing alarming dosimetry, and further security requirements in 10 CFR Part 37 such as providing extra barriers for their mobile source(s). These examples demonstrate the commitment to maintaining adequate protection of workers, the public, the environment, and the security of the U.S., but also demonstrate a recognition of the differences among the large population of users of radioactive and nuclear material within the U.S.

The NRC has conducted multiple efforts to evaluate this framework in the past 3 years, has made revisions to further enhance its source protection program, and continues to monitor the threat environment to proactively identify any need for changes to ensure the security of these materials from potential terrorist threats. This paper will present this graded approach to the integrated safety and security framework that the NRC and Agreement States utilize, expanding on specific examples of this application, and will briefly describe efforts to evaluate and enhance this approach over the years.

State

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Gender

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