

Byproduct Materials

The Nuclear Regulatory Commission's mandate to protect public health and safety and the environment, and to provide for the common defense and security, includes regulation of byproduct material used for commercial, medical, and academic purposes. The NRC and its predecessor, the Atomic Energy Commission, have regulated the use of radioactive materials since 1946. The Energy Policy Act adopted August 8, 2005, amended the definition of byproduct material to include additional types of radioactive materials.

There are four categories of byproduct material as defined in the Atomic Energy Act of 1954, as amended:

1. Radioactive material that results from the production or use of special nuclear material (enriched uranium or plutonium) in nuclear reactors. Examples include cobalt-60, cesium-137, and iridium-192.
2. Tailings or wastes produced by the extraction or concentration of uranium or thorium (source material) from ore.
3. Discrete sources of radium-226 or material made radioactive by use of a particle accelerator that is produced, extracted or converted after extraction for a commercial, medical or research activity. Examples include fluoride-18, cobalt-57, and iodine-123.
4. Any discrete source of naturally occurring radioactive material (other than source material) that the Commission determines could pose a public health and safety or common defense and security threat similar to that of a discrete source of radium-226.

Commercial licensees use byproduct material in both civilian and military applications in such areas as industrial radiography, gauging devices, gas chromatography, and well logging (see attachment). Byproduct material is also used by the general public in various consumer products, such as smoke detectors, some self-luminous Exit signs, static eliminators, and luminous watch dials. Medical licensees use byproduct material for the diagnosis and treatment of patients in hospitals or physicians' offices, with an estimated 16 million clinical procedures performed annually. Colleges, universities, and other academic institutions use byproduct material in course work and research.

Byproduct material is regulated by NRC and 34 states, known as Agreement States. These have entered into agreements with the NRC to regulate the use of byproduct material, as authorized by the Atomic Energy Act, as amended. These states issue licenses and currently regulate approximately 18,000 materials licensees. The NRC maintains jurisdiction in matters regarding the common defense and security, such as security enhancements in the use of byproduct material.

The NRC regulates the use of byproduct material in 16 non-Agreement States, the District of Columbia, the Commonwealth of Puerto Rico, and various territories of the United States. The NRC also regulates federal licensees in all states. Currently, NRC administers approximately 4,400 licenses. In Fiscal Year (FY) 2005, the NRC completed nearly 3,300 reviews of materials licensing actions, including new applications, amendments to existing licenses, license renewals, and sealed source and device reviews. The NRC conducted 1,264 inspections of materials licensees in the same year. The corresponding radiation control programs in the Agreement States have approximately 80 % of the materials licensees, so the actual number of licensing actions and inspections performed within the United States is actually much greater.

The NRC conducts nearly all of its materials licensing and inspection activities from its regional offices. The Office of Federal and State Materials and Environmental Management Programs (FSME) provides technical support and guidance, and conducts periodic evaluations of the regional programs to ensure their technical adequacy, consistency, and timeliness. FSME conducts similar evaluations of the Agreement States and the NRC regional offices through the Integrated Materials Performance Evaluation Program.

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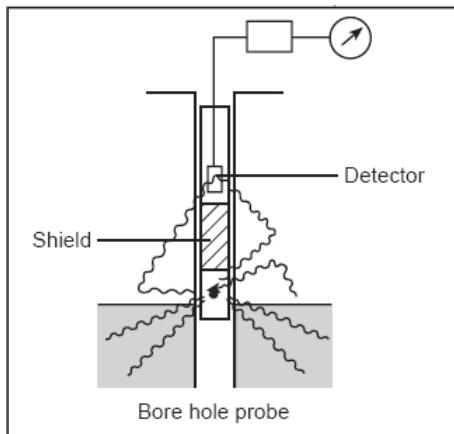
Uses of Radioactive Byproduct Material



Portable radiography camera used to test for cracks in metal



Tritium exit sign



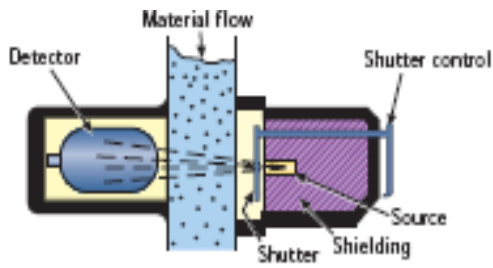
Well-logging devic.



Static eliminators



Gauge, illuminated watch dial, and smoke detector.



Cross section of a fixed fluid gauge



Troxler moisture/density gauge

