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Source Material

What is meant by source material?

In general terms, "source material" means either the element thorium or the element uranium, provided that the uranium has not been enriched in the isotope uranium-235. Source material also includes any combination of thorium and uranium, in any physical or chemical form, or ores that contain by weight one-twentieth of one percent (0.05 percent) or more of uranium, thorium, or any combination thereof. Depleted uranium (left over from uranium enrichment) is considered source material.

Where does source material come from?

Source material can result from the milling and concentration of uranium contained in ore mined for its uranium content. It can also be generated in the process of refining ores mined for other precious metals. In addition, source material can arise from the reprocessing of spent nuclear fuel (no commercial reprocessing is currently licensed in the U.S.) and also, as depleted uranium (contains lower levels of U-235 than natural uranium), from the process of enriching uranium in the isotope uranium-235.

Why is control of source material important?

Congress enacted Title I of the Atomic Energy Act of 1954, as part of President Eisenhower's Atoms for Peace program, including the clause:

> Source and special nuclear material, production facilities, and utilization facilities are affected with the public interest, and regulation by the United States of the production and utilization of atomic energy and of the facilities used in connection therewith is necessary in the national interest to assure the common defense and security and to protect the health and safety of the public.

Natural uranium has a fissile material, uranium-235, that can be concentrated (i.e., enriched) to make highly enriched uranium, the primary ingredient of one type of atomic bomb. Natural uranium can also be used in a production reactor to create plutonium, principally plutonium-239. Plutonium extracted and processed from a production reactor can be used in a second type of atomic bomb. Misuse of nuclear materials intended for peaceful purposes to create a nuclear explosive is illegal. The NRC regulates source material to prevent misuse, to provide for the common defense and security, and to protect the health and safety of the public.

Source Material Regulations

The NRC regulates peaceful use of source material through licensing and oversight of licensee operations. Some of the regulations that pertain to source material possession or use are shown in the following table.

Subject	*Code of Federal Regulations*
Radiation Protection Standards	10 CFR Part 20
Source Material Licensing	10 CFR Part 40
Gaseous Diffusion Plants (uranium enrichment)	10 CFR Part 76
International Atomic Energy Agency (IAEA)	10 CFR Part 75