



The casks are designed to withstand extreme accident conditions, and have been repeatedly tested by scientists and engineers at our nation's defense laboratories. While standard tests include a 30-foot drop onto a hard, unyielding surface (equivalent to hitting a concrete bridge abutment at 120 miles per hour), a 40-inch drop onto a steel rod, a 30-minute fire engulfing the entire cask at 1,475 degrees, and submergence of the cask under water for eight hours, no casks have failed to date during any test.

Casks have also been subjected to more severe tests, including being dropped 2,000 feet from a helicopter onto soil as hard as concrete, traveling at 235 miles per hour at impact; being rammed into a concrete wall at 80 miles per hour; and being hit broadside by a rocket-propelled rail locomotive traveling 80 miles per hour. None were damaged enough to release their contents.

Will spent fuel shipments traveling through Illinois be safe?

Illinois currently has the most extensive inspection and escort program of any state. Nearly 500 of those shipments have passed through Illinois since the state began its program of inspecting and escorting every shipment in 1983. While a few of the shipments have been delayed briefly for minor technical reasons, there have been no significant incidents involving the shipments, and none at all involving radiation.

The state's inspection and escort staff—which includes staff from the IEMA-Division of Nuclear Safety, the Illinois State Police and the Illinois Commerce Commission—is equipped and trained to be the initial response to any accidents that may occur during a shipment. IEMA-Division of Nuclear Safety and other state agencies would be ready to implement the state's emergency response plan shortly after an accident occurs. The department also has been offering training for local emergency response personnel and agencies along the actual and proposed shipping routes.

For more information, contact:

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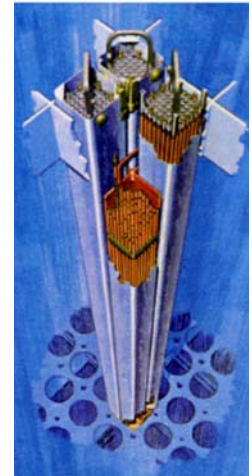


What Is Spent Nuclear Fuel?

Illinois currently houses more spent fuel than any other state, and in a few years—once a national repository opens—many shipments of spent fuel will pass through the state.



While the Illinois Emergency Management Agency(IEMA)-Division of Nuclear Safety does not regulate spent nuclear fuel, the state does have an interest in protecting the public and environment from the potential hazards spent fuel presents. In conjunction with the U.S. Nuclear Regulatory Commission, IEMA-Division of Nuclear Safety resident inspectors at the state's commercial nuclear power stations help ensure safety by inspecting spent fuel stored there. In addition, the department and other state agencies inspect and escort shipments of spent fuel that move on highways and railroads in Illinois. The department and other agencies are trained and equipped to respond should an accident occur during a shipment.



Here are answers to some of the questions most commonly asked by Illinois residents about spent nuclear fuel.

What is spent fuel?

Nuclear fuel is the energy source that powers a nuclear generating station. Nuclear fuel consists of small ceramic pellets, each about the size of a pencil eraser, of uranium oxide. Thousands of these fuel pellets

are inserted into strong metal tubes called cladding that are about 14 feet long. The tubes are arranged in groups called fuel assemblies.

Before the fuel goes into a reactor, it is cool and only slightly radioactive. Inside a reactor core, the “fission,” or splitting of uranium atoms into smaller “daughter” atoms of other elements, generates considerable heat and radiation. Many of these daughter products are highly radioactive and contribute to the heating of water in the core. This heat is used to create steam, which in turn drives turbines that generate electricity.

After a time, the fuel no longer contributes efficiently to the fission process, and must be replaced. When it emerges from the core, it is called spent nuclear fuel. The spent fuel must be stored in deep pools of water until a significant amount of the heat and radiation has decayed.

Where is it stored?

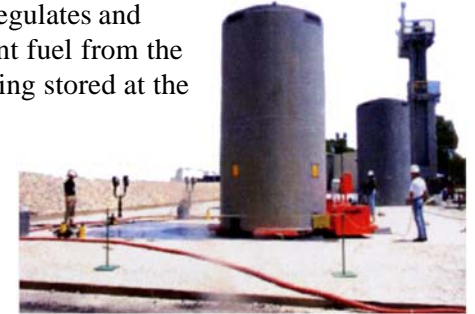
Until a permanent storage or disposal facility is operating, spent nuclear fuel is being stored at places where it was never intended to stay for long: 131 locations in 39 states. These are the nation’s commercial nuclear power reactors, and one offsite storage facility. This includes eight sites in Illinois: the seven commercial nuclear power stations (Braidwood, Byron, Clinton, Dresden, La Salle, Quad Cities and Zion) and the General Electric-Morris facility. GE-Morris was intended to be a reprocessing center but it never operated. However, the company was contractually required to take possession of some spent fuel. It is currently the only away-from-reactor spent fuel storage facility in the country.

Most spent fuel is stored in deep pools of ultra-clean water inside the power stations. These cooling pools were originally intended to hold spent fuel for only a few years, but at some stations, the fuel has been there for more than four decades. In the early years of nuclear power, reprocessing of spent fuel was expected to recover the remaining usable uranium and separate the fission products for separate use or disposal. Spent fuel would be held in the cooling pools for a few years, then shipped to a reprocessing center. However, for a variety of reasons, reprocessing of commercial spent fuel never advanced beyond the preliminary stages in the U.S.



At some power stations, older spent fuel has cooled considerably and is now stored in dry casks at secure locations near the power stations. These specially designed reinforced concrete structures are kept cool by the movement of air. The federal Nuclear Regulatory Commission (NRC) regulates and inspects these storage casks. Spent fuel from the Dresden Unit 1 reactor is now being stored at the station in dry casks.

Regardless of how well this storage works presently, it is only a temporary measure, because the power stations were never intended to permanently house spent fuel.



Is there a permanent disposal facility for spent fuel?

Not yet, although the U.S. Department of Energy (DOE) has designated, and Congress has approved, the Yucca Mountain site in Nevada. After 20 years of intensive study and testing of the site, DOE in the summer of 2002 started the process for licensing the facility with the U.S. Nuclear Regulatory Commission. Licensing could take several years.

If licensed, Yucca Mountain will eventually hold about 77,000 tons of spent nuclear fuel and other high-level radioactive wastes.

Several utilities are working together on developing a monitored retrievable storage site in Utah to temporarily store spent fuel. This site, on land owned by a Native American tribe, would hold spent fuel from these utilities until a repository is ready to accept it.

How safe are the casks used to ship spent fuel?

In more than 30 years of commercial spent fuel shipments across the country, there have been no accidents releasing radiation, and no significant accidents of any kind involving spent fuel casks. More than 2,700 shipments have traveled more than 1.6 million miles on our nation’s highways and railroads. The shipping records in Europe and Japan are similar, although shipping distances are generally shorter while population densities are generally higher than in the U.S. While foreign shipping casks differ in detail, they are also built to similar high standards and tested in similar ways.