

THE NUCLEAR WASTE POLICY ACT: AN OVERVIEW

The Nuclear Waste Policy Act of 1982 and amendments set forth U.S. policy for disposal of spent fuel from nuclear powerplants and high-level radioactive waste from our Nation's defense programs. Our law requires the U.S. Department of Energy to develop and operate a system that provides safe storage, transportation, and final disposal of these wastes deep underground in a geologic repository. A geologic repository is basically a mine with a special purpose.

3.1 The Laws

Passage of the Nuclear Waste Policy Act of 1982 (NWPA) was a major milestone in the Nation's management of high-level nuclear waste. The Act was signed into law by President Reagan in January 1983. In December 1987, Congress amended it by passing the Nuclear Waste Policy Amendments Act of 1987.

These laws set forth the national policy for safely storing, transporting, and disposing of spent nuclear fuel and other high-level radioactive waste. They made the Department of Energy (DOE) responsible for carrying out the requirements of the law and created the Office of Civilian Radioactive Waste Management within DOE to do the job. DOE must develop, manage, and operate a waste system to protect the public health and the environment. Specifically, DOE must site, construct, and operate a deep, mined geologic repository. In addition, DOE is authorized to:

- site, construct, and operate one monitored retrievable storage (MRS) facility, under certain conditions; and
- develop a system for transporting high-level nuclear waste to an MRS facility and repository.

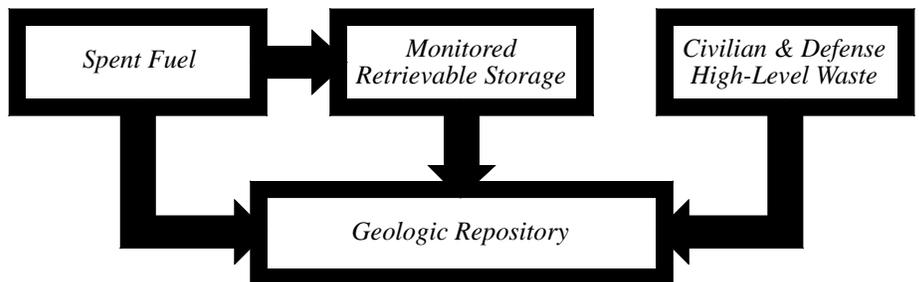
What is the Nuclear Waste Policy Act?

Milestone —

A significant event in history...*Getting a driver's license is an important milestone for most teenagers.*

What do the laws require?

What agency is responsible for developing the system?



The United States has a national policy for safe transport, storage, and final disposal of spent fuel and other high-level nuclear waste.

3.2 Geologic Disposal

Planning and working toward final disposal of high-level nuclear wastes is not new. The United States began studies for isolating high-level nuclear waste in 1957 when the National

When did studies begin?

Isolate —

To set apart from a group or whole...*When he had chicken pox, he was isolated from the other children so they wouldn't catch the disease.*

Academy of Sciences first recommended deep geologic disposal. Study of thick deposits of salt as possible repository sites started in the 1960's. During the 1970's, scientific research began in basalt and welded tuff (types of volcanic rock) on lands owned by the Federal Government. In the late 1970's, scientists also began to investigate granite and similar types of rock.

3.3 History of Finding a Site

In February 1983, as required by the law, the Department of Energy named nine potentially acceptable sites for a permanent geologic repository. The sites were in:

How many potential sites were first named?

Louisiana	(1)	Texas	(2)
Mississippi	(2)	Utah	(2)
Nevada	(1)	Washington	(1)

Are there guidelines for site evaluation?

The law also required DOE to issue guidelines that explain how any site will be evaluated to determine whether it is suitable for a repository and that identify specific factors that would disqualify a site. In December 1984, DOE issued guidelines that reflected much consultation, input, and review from the public, States, and Federal agencies. Also, the Nuclear Regulatory Commission (NRC) agreed to the guidelines. This is significant because the NRC must grant a license before any construction can begin on a repository.

Narrowing the Search

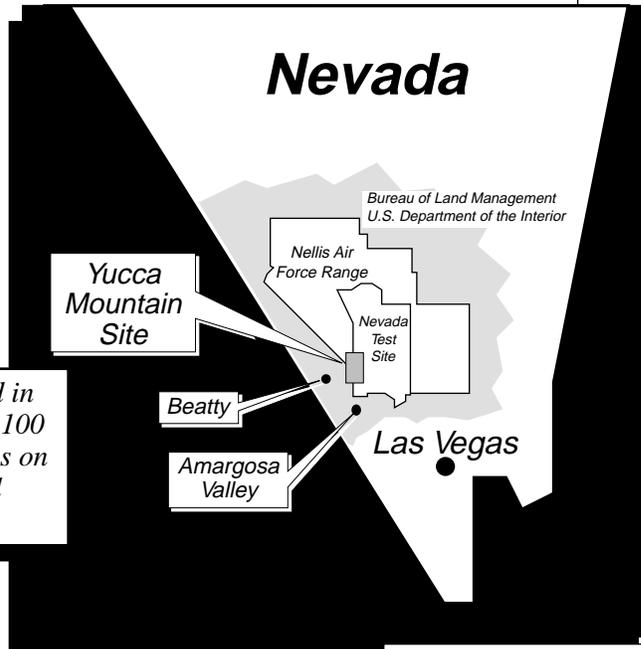
In 1986, following environmental assessment of all nine sites, the search for a site narrowed. Following the law, DOE

What sites were named in 1986?

recommended three sites to the President for very detailed studies. Following approval, these studies (called site characterization) began at Yucca Mountain, Nevada; Deaf Smith County, Texas; and Hanford, Washington. Congress became concerned with delays and rising costs of this program and, in late 1987, amended

*What is the only site being studied now?
Who named this site?*

The Yucca Mountain site is located in Nye County about 161 kilometers (100 miles) northwest of Las Vegas. It is on land already owned by the Federal Government.



the law, directing DOE to focus site characterization efforts only on Yucca Mountain, Nevada. This amendment directed DOE to end studies at the other sites.

Geology —
Structure of a specific region of the Earth...*The class studied the geology of the area by looking at the rocks along the Interstate.*

3.4 Site Characterization

Detailed site studies of Yucca Mountain will include both surface and underground studies. These in-depth studies will help determine the capability of the underground site to keep nuclear waste isolated from the environment.

What will happen during site characterization?

What do we need to know? Many studies will concentrate on the geology and hydrology of the site. What does that mean? It means we need to know as much as possible about the rocks, rock formations, and water at Yucca Mountain. Some specific questions are:

Hydrology —
The scientific study of the properties, distribution, and effects of water in the atmosphere, on the Earth's surface, and in rocks and soils...*To understand the hydrology of the area the students studied both surface water and ground water.*

- What is the depth, thickness, and extent of the "host" rock?

What will be studied?

Ground water —

Water found underground in porous rock strata and soils, as in a spring.

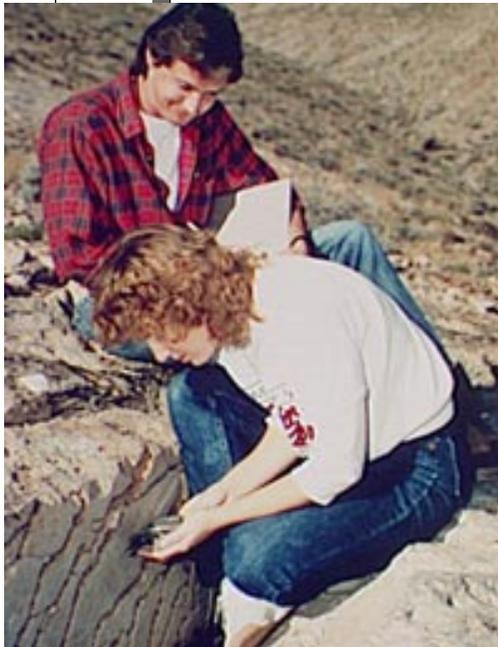
Data —

Information, especially information organized or used as the basis for decision-making.... *They collected and analyzed data about the site.*

- What is the structure of the “host” rock? What is the rock made of? How did it form? How do the elements that make up the rock respond to heat? To water?
- What about ground water? How much water is actually present? Where does it come from? How far is it from the surface to the water table? In what direction does ground water flow? How fast?
- How much surface water is there? Where does it come from? How does it flow? How fast?
- What is the terrain at the site?
- What is the potential for volcanic activity? For earthquakes?
- Are potential resources, like minerals, present?
- What was the climate like in the past? What might it be in the future? How might climate change affect a repository?

Goals of Site Characterization

- To determine whether Yucca Mountain is suitable to be developed as a repository.
- To gather information about geology, hydrology, geochemistry, and other conditions of the candidate site.
- To provide data for design of the waste package and the repository itself.
- To provide data needed to assess the performance of the proposed repository system.
- To provide data for recommendation of the site, if it is found suitable through site characterization.
- To provide information to license the repository, if the site is suitable.



Data collection activities

3.5 Environment, Society, and Economy: How Are They Affected by the Repository?

In addition to conducting purely scientific studies, DOE will also study possible positive and negative impacts of the repository. Special research will focus on impacts on the environment, society, and its economy. For example, are there any species of animals or plants that could be lost as a result of building and operating a repository at this site? Will jobs be created for people living in the area? If sited in



The impact on the desert tortoise will be considered.

Nevada, will a repository have any effect on tourism or economic development and growth within Nevada? Consideration will be given to these and many other questions during site

characterization. Ways of lessening adverse impacts will also be considered.

A report called an *Environmental Impact Statement (EIS)* is required before a license can be issued and construction can begin for the geologic repository. DOE has been collecting environmental data for several years to use in preparing the EIS. Once a site is selected, the U.S. Environmental Protection Agency (EPA) will review and comment on the environmental impact statement, and public hearings will be held to address any questions that are raised.

3.6 Site Selection

If the Site Is Found Unsuitable

If, at any time, the site is found unsuitable, site characterization activities will stop. DOE will then report to the Congress and to the Governor and State Legislature of Nevada, detailing reasons for such a decision.

What else will be studied?

Impact —

The effect of one thing on another....*Doing his homework instead of watching TV has a good impact on his grades.*

What happens if the site is unsuitable?

If the Site Is Found Suitable

What happens if the site is suitable?

If, on the other hand, site studies should determine that the Yucca Mountain site is suitable for a repository, DOE can recommend it to the President. If it recommends the site, DOE must notify the Governor and State Legislature of Nevada at the same time. If the President approves, the recommendation goes to the Congress for consideration.

What can Nevada do?

What happens next depends on whether or not the State of Nevada has entered into a Benefits Agreement. By law, unless the State of Nevada has previously entered into a Benefits Agreement

What if there is a Benefits Agreement?

Benefits Agreement and the Site Selection Process

How does the existence of a Benefits Agreement between the State and DOE affect the site selection process? If a Benefits Agreement exists, the State receives certain payments and other benefits, such as involvement in planning the repository. But if a State enters into a Benefits Agreement, it gives up its right to disapprove a recommendation of the site.

with DOE, it may submit a Notice of Disapproval to Congress within 60 days. If it decides to do this, disapproval prevents the use of the site for a repository, ***unless*** Congress passes a Joint Resolution to override the State's disapproval. Congress must act within the next 90 days of continuous session.

What is the role of Congress?

If no Notice of Disapproval is submitted, or if Congress overrides a Notice of Disapproval, the site designation becomes effective. At that time, DOE can apply to the Nuclear Regulatory Commission for authorization to construct the repository.



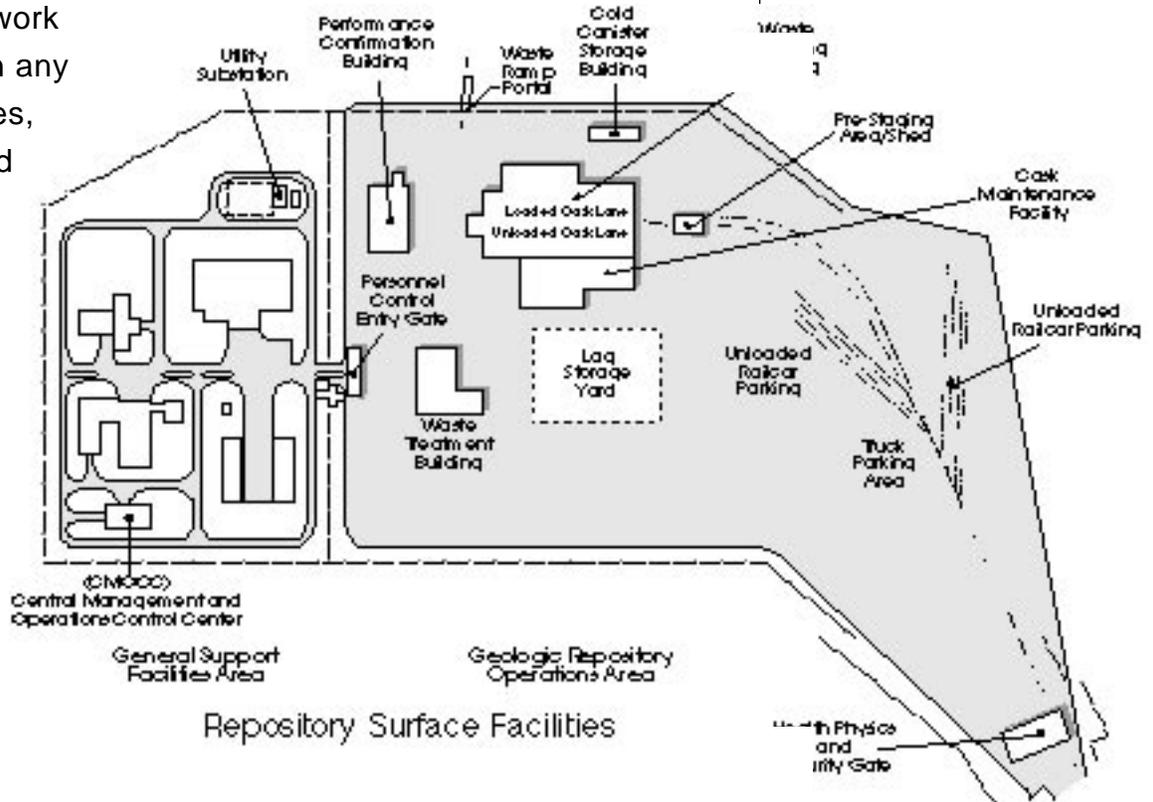
Congress must approve the site recommended for a repository before selection is final.

If a State or Tribe Volunteers

There is one other way a location for a repository may be determined. In 1987, Congress established the Office of Nuclear Waste Negotiator. This office is not a part of any other Federal agency or department and reports to the President and Congress. In 1993, Richard H. Stallings was selected as the Negotiator after David Leroy, who had served as Negotiator from 1990-93. His job was to seek a State or Indian Tribe willing to host a repository or storage facility. If a host volunteered, he would work out the terms or conditions under which the State or Indian Tribe would accept a repository or storage facility and submit those terms or condition to Congress for approval. A volunteered site could be used only if it was found suitable. Note: Statutory authority for the Office of the Nuclear Waste Negotiator expired in January 1995. See "Notice to Educators" in the front of this Unit.

3.7 What Might the Repository Look Like?

Should Yucca Mountain be approved as the repository site, the facility will include structures located both on the surface and underground. The surface buildings will cover 150 to 400 acres. Special facilities for receiving, unloading, and handling the containers of spent fuel and other high-level nuclear wastes will be built. There will also be buildings for the kinds of work necessary to run any industry — offices, maintenance and repair shops, warehouses, etc.



How much surface land is needed?

How large will the subsurface area be?

The subsurface facility will resemble a large mine of about 567 hectares (1,400 acres). It will include ramps and passageways for moving the waste containers from the surface into permanent disposal within the tunnel floors.

3.8 Monitored Retrievable Storage

Educators, please refer to the "Notice to Educators" at the beginning of this Unit for current information on the concept of a Monitored Retrievable Storage facility. The law also authorizes DOE to site, construct, and operate a monitored retrievable storage (MRS) facility, subject to certain conditions. For

Who can site, construct, and operate an MRS facility?

example, the MRS facility cannot be located in Nevada. Another condition is that construction of the MRS facility cannot begin until a repository is licensed by the Nuclear Regulatory Commission. There is also a limit on the amount of waste that can be stored at any one time in the MRS facility.

To get an independent evaluation on the need for an MRS facility, Congress appointed an MRS Review Commission to study the need for an MRS facility as part of the total system. The Commission recommended that Congress provide for interim storage before permanent disposal. DOE considers an MRS facility to be a key part of the entire nuclear waste management system. That's because it would receive and package spent fuel from some nuclear powerplants and temporarily store it until a repository is ready. From an MRS facility, the waste would be shipped by special trains to the permanent geologic repository. The MRS facility would give the total system flexibility that would enable DOE to meet its goals of timely acceptance and disposal of waste.

What is the purpose of the MRS facility?

How would the MRS facility improve the total system?

Where will the MRS facility be located?

What is the job of the Negotiator?

A Place for the MRS Facility

The location for an MRS facility has yet to be identified. One job of the Negotiator, appointed by the President, is to search for a State or Indian Tribe willing to host an MRS facility. The Negotiator will work with interested States or Indian Tribes to find a suitable location.



Waste from some nuclear powerplants could be stored temporarily at an MRS facility.

3.9 Transporting Nuclear Waste

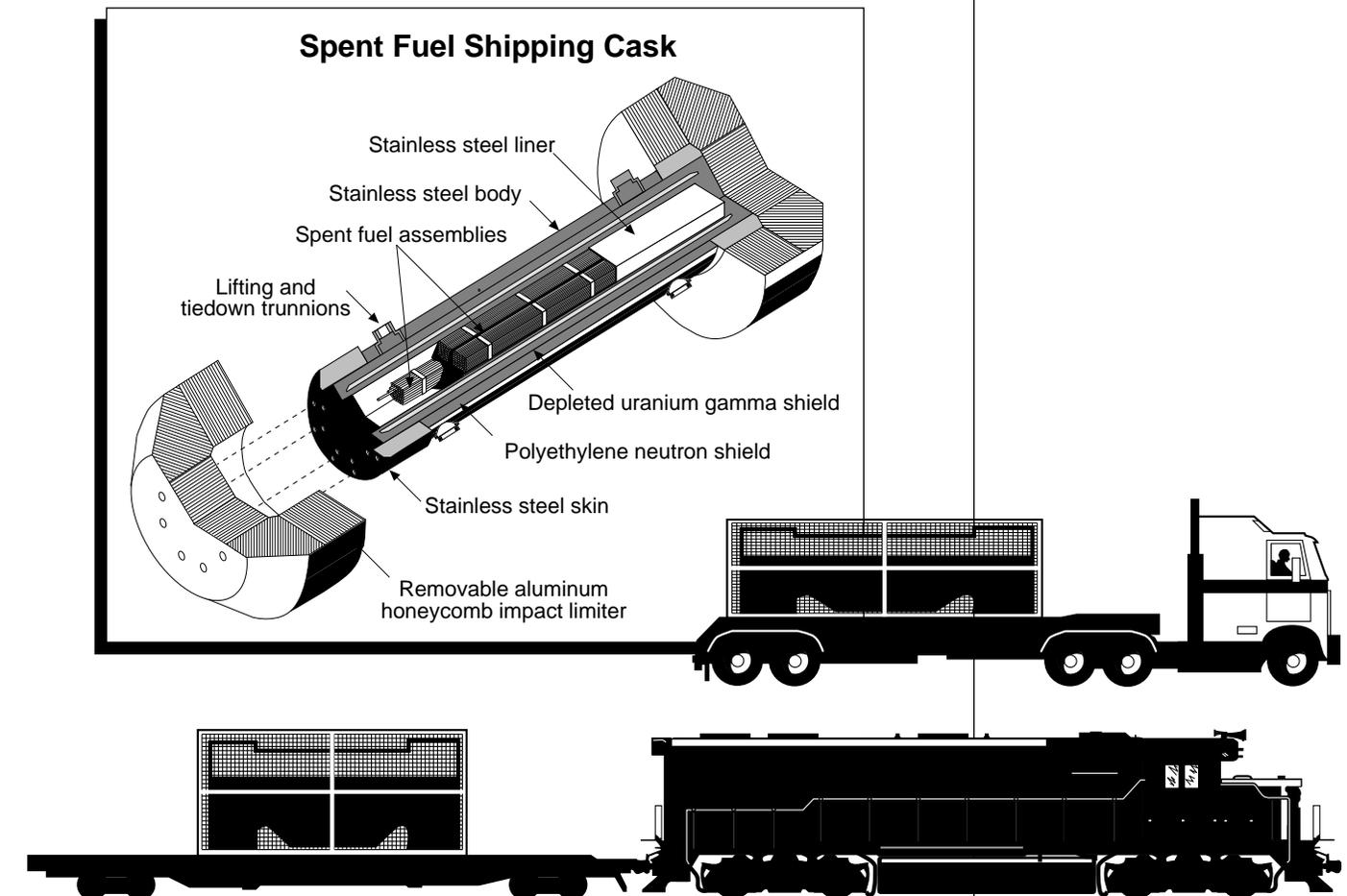
Safe transportation of spent fuel and other high-level nuclear waste is crucial to the success of our waste management system. Fortunately, the United States has 40 years of experience in transporting radioactive materials. Working together, the U.S. Departments of Transportation and Energy and the Nuclear Regulatory Commission have an excellent record of safely transporting highly radioactive material.

Casks for Spent Fuel

Spent fuel shipping casks have passed tests that measured their ability to protect their contents even under the most severe conditions. New shipping casks are being developed to minimize the need for handling spent fuel and to carry more spent fuel per cask.

What is the safety record for nuclear waste shipments?

What about casks? Why will new casks be designed?



Spent fuel shipping casks may be transported by rail or on interstate highways by flatbed truck.

Who certifies casks?

Shipping cask designs must undergo testing and be certified by the Nuclear Regulatory Commission before they can be used.

Certified —

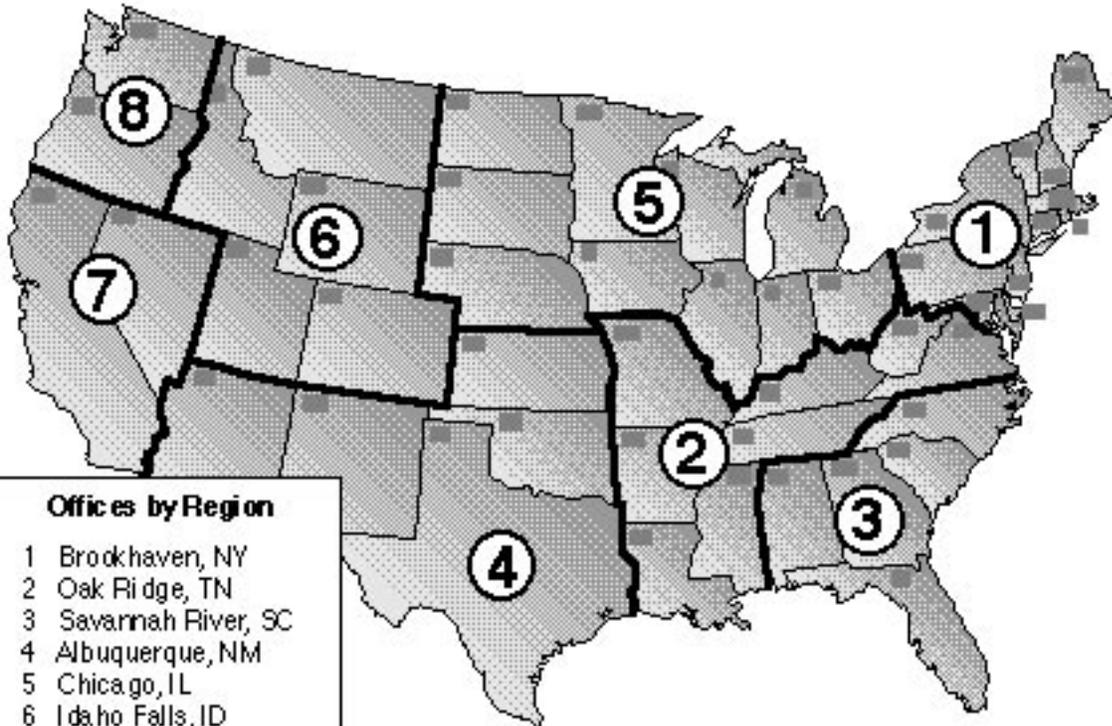
To guarantee as meeting a standard...*Before I got the job, the coach certified that I had passed the lifeguard test.*

Other Transportation Issues

Federal guidelines apply to transportation of all hazardous materials, including radioactive materials. DOE consults with local, Tribal, and State governments as well as the general public about transportation issues. Existing laws and regulations concerning spent fuel and other high-level nuclear waste shipments will be enforced by local, State, and Federal agencies.

Are State, local, and Tribal governments involved?

U.S. Department of Energy Emergency Operations Centers



Offices by Region

- 1 Brookhaven, NY
- 2 Oak Ridge, TN
- 3 Savannah River, SC
- 4 Albuquerque, NM
- 5 Chicago, IL
- 6 Idaho Falls, ID
- 7 San Francisco, CA
- 8 Richland, WA

There are eight DOE Regional Coordinating Offices and Emergency Operations Centers that can dispatch radiological assistance teams to support State and local responders.

Source: DOE/Oak Ridge Regional Coordinating Office and Emergency Operations Center, 1994.

DOE will provide funding for and assist States in training their local and/or Tribal public safety officials. Procedures for safe transport of high-level nuclear waste will also include rapid response to emergency situations through Energy Emergency Response Centers.

3.10 Financial Assistance and Benefits Agreement

The NWPA provides for financial assistance to offset the impacts from siting and/or developing a repository or MRS facility. For example, funds have been provided to the State of Nevada to study issues related to the repository.

Also, the 1987 amendments permit the Secretary of Energy to enter into a Benefits Agreement with a State or Indian Tribe hosting a repository or MRS facility. A Benefits Agreement entitles the State or Indian Tribe to receive certain benefits, including payments. However, a State or Tribe entering into a Benefits Agreement gives up its right to disapprove the site. Annual payments would begin before receipt of the waste and continue until the repository closed. At least one-third of payments would go to those units of local or Tribal governments affected by the facility.

Benefits Agreement Annual Payments		
	Before Waste Is Received	After Waste Is Received
Repository	\$10 Million	\$20 Million
MRS Facility	\$5 Million	\$10 Million

A Benefits Agreement also provides for a review panel. The law requires members to be selected to give fair representation to the State, Tribal, and local governments; those paying for the system; and other public interests. The panel would carefully examine and evaluate all phases of the facility — from design and construction to operation and closing. The review panel would: 1) advise the Secretary of Energy, 2) present State, Tribal, and/or local points of view, and 3) participate in planning.

Who will pay for training for safety officials?

Is there financial aid?

What about the right to disapprove the site?

Will affected local governments be paid?

How much can Benefits Agreements pay?

Can the State or Tribe have a review panel?

What would a review panel do?

***What is the Technical Review Board?
What does it do?***

3.11 The Nuclear Waste Technical Review Board

The amended NWPA established a Nuclear Waste Technical Review Board to provide independent technical and scientific evaluation. The members were nominated by the National Academy of Sciences and appointed by the President. Members are people who have distinguished themselves in the fields of science and engineering. The Board examines and evaluates the DOE activities in site characterization and the packaging and transporting of high-level nuclear waste. It reports to both Congress and DOE at least twice each year until disposal begins.

Who pays for disposal?

3.12 The Nuclear Waste Fund

The Nuclear Waste Fund makes it possible for the Federal Government to pay for the development and operation of the high-level nuclear waste management system. Established by the NWPA, the Fund collects money from those who own or generate the waste. Each nuclear powerplant pays a fee for every kilowatt-hour of electricity it produces using nuclear energy. Currently, the fee is one-tenth of one cent for each kilowatt hour of electricity produced. Like all costs of doing business, this cost is typically passed along to the utility company's customers. The Federal Government will pay all costs of defense waste disposal.

What is the National Energy Strategy?

Who published it?

Who is responsible for its implementation?

3.13 Progress in Implementing the Law and the National Energy Strategy

In February 1991, the National Energy Strategy (NES) was published by the U.S. Department of Energy. It presents a comprehensive strategy for producing and using energy in the future and contains more than a hundred initiatives whose implementation is a shared responsibility with the American public, the private sector, academia, and all levels of government. Among other things, it establishes a national commitment and strategies to ensure implementation of the Nuclear Waste Policy Act of 1982 and its amendments to establish an effective U.S. nuclear waste management program.

Specific nuclear waste management actions called for in the Strategy are:

- Ensure that all Federal agencies carry out their activities consistent with the initial operation of a monitored retrievable storage facility to begin accepting spent nuclear fuel by 1998; and,
- Allow the timely characterization of the candidate repository site at Yucca Mountain, Nevada, and achieve the licensing and operation of a high-level nuclear waste repository at a suitable site as expeditiously as possible.

In addition, the Strategy included the commitment by the Department of Energy to develop processes that ensure focused, productive dialogues with all interested parties, and to strive to see that all program managers are aware of and responsive to issues that concern the public.

In February 1992, one year later, the U.S. DOE published a report on the progress that has been made in implementing the strategy. In the area of nuclear waste management and implementation of the Nuclear Waste Policy Act, the following progress was made:

- After a 3-year legal dispute that ended in favor of continuing congressionally mandated studies to determine whether Yucca Mountain, Nevada, is a suitable site for a repository, the Department of Energy received initial environmental permits from the State of Nevada and in mid-1991 began new site investigation work.
- Following discussions with the former Nuclear Waste Negotiator, by February 1992, seven municipalities and Indian Tribes had applied for DOE grants to study the feasibility of siting in their jurisdiction an MRS facility for temporary aboveground storage of nuclear waste. As of October 1994, twenty-four municipalities and Indian Tribes had applied for feasibility study grants, approximately half were awarded.

What does the NES have to do with nuclear waste management?

Who has applied for DOE grants to study the feasibility of siting an MRS in their jurisdiction?

3.14 An Evolving Program

***Can the laws change?
Why is this important
to us?***

Unlike many subjects you study, the nuclear waste management program is an evolving program still in the decision-making stages. Many questions remain. One of the strengths of our system of government is that it is structured so that Congress can respond to new or changed circumstances as they arise by amending laws. It is important, therefore, to realize that Congress can amend the laws described here. For this reason, it is necessary not only to learn about the law that governs nuclear waste today, but also to be aware that the law can change. It will be important for you to keep up with current events so that, if and when the law changes, you will continue to be an informed citizen.