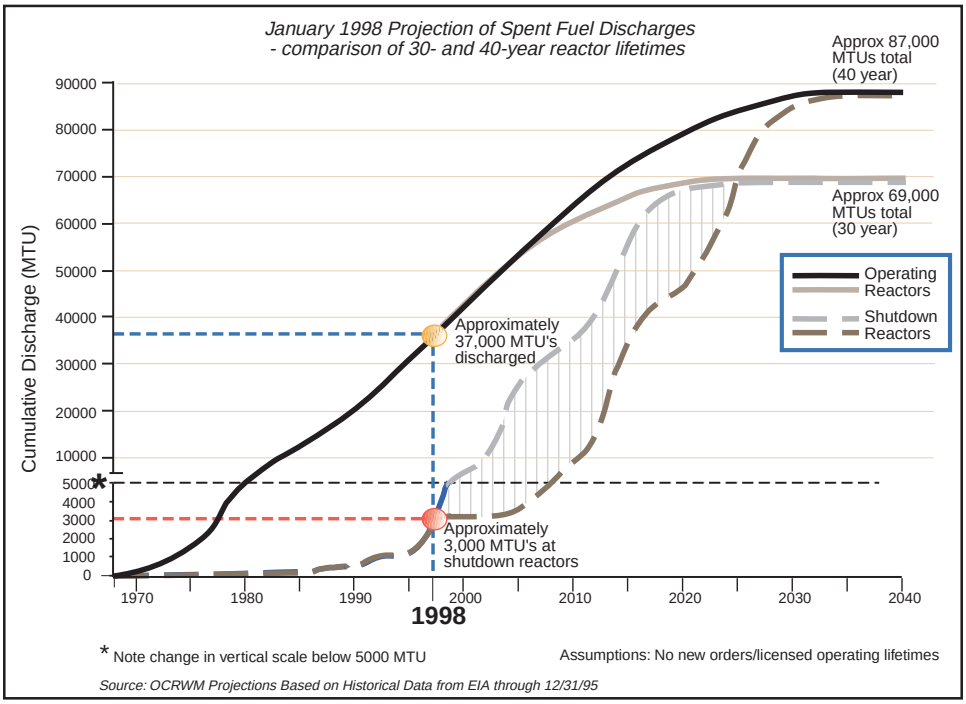
Introduction: Why This Program Matters

What Is the Extent of "the Waste Problem"?

Decisions made decades ago to pursue a nuclear weapons program and develop nuclear energy for civilian use committed the Nation to perpetual custody of a large and growing inventory of radioactive materials. The potential risks posed by these materials demand continuous, responsible long-term management.



Projection of Commercial Spent Fuel Discharges

As of December 31, 1997, spent nuclear fuel containing approximately 37,000 metric tons uranium (MTU) was stored at 72 commercial power reactor sites and one storage site in 33 States. Of the 118 reactors at these sites, 107 were operating and 11 were shut down. Of the shut-down reactors, 8 were at sites that were completely shut down and awaiting decommissioning. Nine operating commercial power reactor sites have exhausted their existing storage pool capacity and added on-site dry storage; others are approaching full capacity and will need additional storage. Based on current projections, by 2035, when the last of the existing 118 commercial power reactors completes its initial 40-year license period, spent nuclear fuel containing a total of about 87,000 MTU will have been generated.

Most Government-managed nuclear materials destined for geologic disposal result from atomic energy defense activities; others are of commercial origin but are now under DOE management. They primarily include DOE spent nuclear fuel from weapons production, domestic research reactors, and foreign research reactors; high-level radioactive waste from reprocessing spent nuclear fuel; surplus weapons-grade plutonium; and Naval spent nuclear fuel. Chapter Three provides detailed information on these materials.

What Is at Stake?

With large and growing inventories of nuclear materials requiring safe, permanent disposal, large interests ride on OCRWM's work:

- There are mounting inventories of spent nuclear fuel at nuclear utility sites.
- Orderly operation of the nuclear reactors that supply 20 percent of the Nation's electricity rests on NRC licensing, which in turn relies on a waste-confidence decision review that the NRC conducts every 10 years to assess the prospects for timely disposal of commercial spent nuclear fuel. Without progress toward a repository,

continued reactor operations and license renewals could be jeopardized.

- Economic conditions could accelerate the shutdown of some nuclear power reactors, leaving the utilities that own them responsible for maintaining custody of their spent nuclear fuel until the Federal Government can accept it.

- A geologic repository is on the critical path for the accelerated environmental cleanup of numerous DOE sites around the country. That cleanup serves not only an environmental, but a fiscal goal: reduction of the huge mortgage costs that are the legacy of the Cold War.

- The Navy needs to dispose of its spent Naval reactor fuel to ensure the continued operation of its nuclear-powered fleet. Currently stored in Idaho under a consent agreement with the State, the fuel must be removed from the State by 2035.

- Internationally, permanent geologic disposal is the consensus position on management of commercial spent nuclear fuel. The Administration fully maintains our Nation's commitment to this position, which is the technical foundation for our international policy on nuclear non-proliferation. That policy assumes that fuel originating in the U.S. and used in foreign research reactors will be disposed of in the U.S. repository, and it undergirds our advocacy of limiting the international trade in weapons-grade nuclear materials.

- Finally, in an unstable world, a grim reality drives the consensus position: the longer that weapons-grade plutonium remains above ground, the greater the risk that terrorists will divert some of it and use it to fabricate nuclear devices. Even one crudely made "dirty" bomb could cause catastrophic damage. The U.S. commitment to permanent disposal clearly signals our larger commitment to the stringent nuclear safeguards and security that we want to promote worldwide.

What Have We Achieved to Date?

The "waste problem" presents a unique and daunting set of challenges: (1) the complexities of managing a large project in a Federal setting subject to multiple regulatory, planning, and reporting requirements, stringent oversight, changes in congressional direction, and fluctuations in funding; (2) the uncertainties associated with operating on a scientific frontier; (3) the need to integrate an unusually broad array of scientific, technical, and managerial disciplines; (4) the demands of a complex licensing proceeding; and (5) the political sensitivities of carrying out an inherently controversial mission.

Over the past 15 years, many Congresses, several Administrations, regulatory and oversight bodies, diverse stakeholders, OCRWM's own staff and contractors, and other program participants have worked steadily toward the goal of geologic disposal. Today, more than 50 years after nuclear weapons were first developed and 40 years after the first commercial nuclear power reactor was built, the United States is closer to solving its waste problem than any other nation on earth. A measure of the U.S. achievement is the fact that officials from the nuclear waste management programs of other nations continue to look to the U.S. program as a model for their own efforts. Among our valuable assets are the following:

- The Nuclear Waste Policy Act of 1982, as amended, which codified the commitment of the Federal Government to solve "the waste problem" and created a financial mechanism to pay for the solution.

- A promising potential repository site at Yucca Mountain.

- A recently completed underground laboratory at the site that provides direct access to the proposed repository rock formations.

- An increasingly sophisticated body of scientific, engineering, and performance assessment expertise needed to (1) design site investigations that yield needed data, (2) design facilities tailored to the site and NRC licensing, and

(3) couple data generated from site investigations with design, to develop models simulating the performance of the repository under a range of conditions over thousands of years.

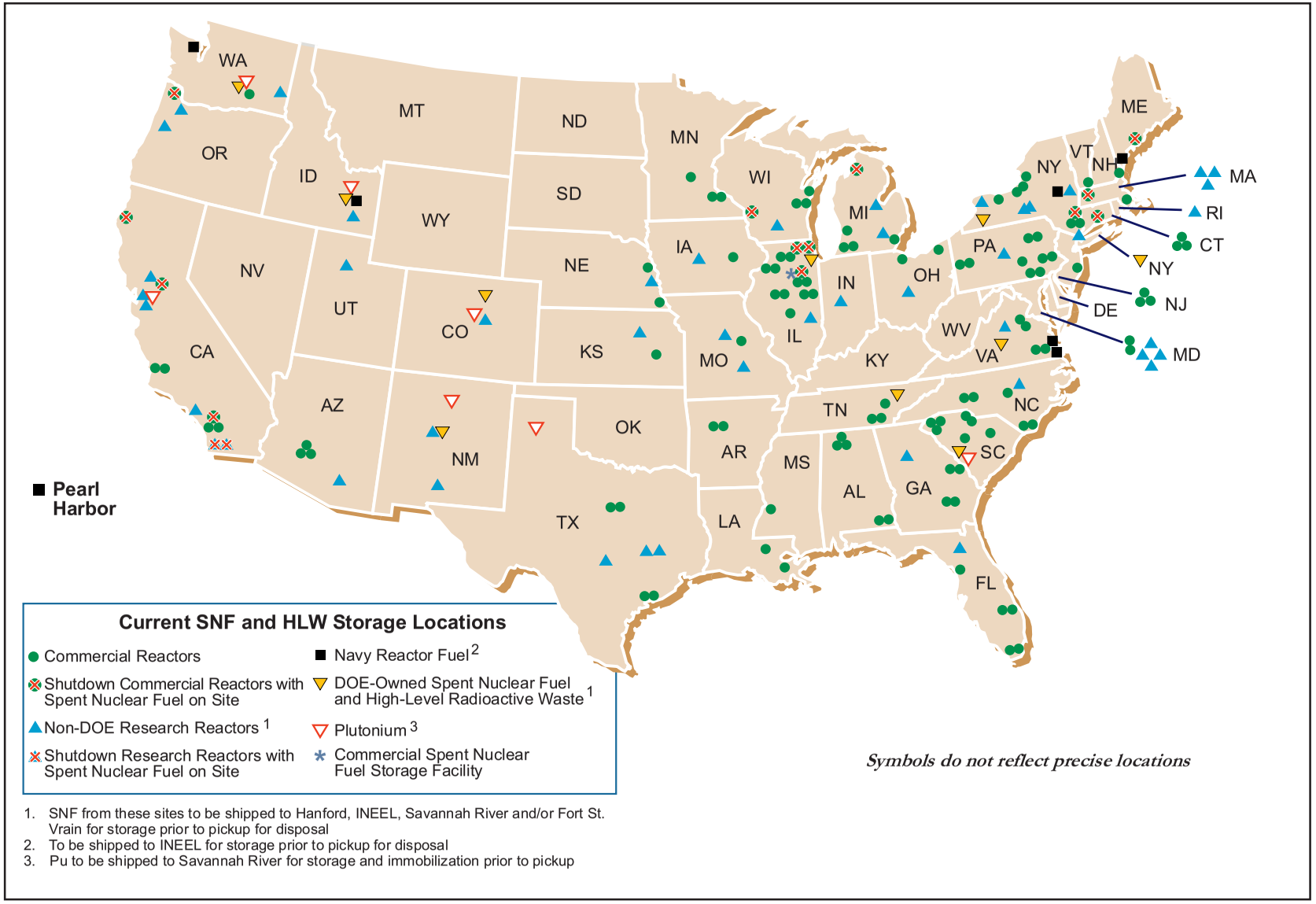
- The regulatory expertise to prepare for a complex licensing proceeding that could take at least 3 years, and the firm foundation for licensing that results from years of work by DOE and the NRC to align their approaches to technical and procedural matters.

- A sound and tested strategy and program plan, and the mature program infrastructure and seasoned managers that can integrate the work of scientists, engineers, performance assessment modelers, and regulatory experts.

- Extensive knowledge, gained through years of Departmental and commercial experience, of the technical, institutional, contractual, and logistical requirements of creating a nationwide system to safely transport radioactive waste.

- The long-standing and productive working relationships with oversight bodies, the larger technical and scientific communities, and a host of stakeholders that can help earn public acceptance for OCRWM's program.

As Fiscal Year 1997 ended, the benefits of years of effort were converging in the viability assessment that will give policy makers comprehensive, timely information about the prospects for repository development at the Yucca Mountain site. That assessment will also move the program closer to a definitive determination of site suitability and—if the site proves suitable—on to a site recommendation and the world's first licensing proceeding for a deep geologic repository.



Locations of Spent Nuclear Fuel and High-Level Radioactive Waste Destined for Geologic Disposal