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U.S. GOVERNMENT
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Calendar No. 412

107TH CONGRESS, 2d Session | SENATE | REPORT 107–159

APPROVAL OF YUCCA MOUNTAIN SITE

JUNE 10, 2002.—Ordered to be printed

Mr. BINGAMAN, from the Committee on Energy and Natural Resources, submitted the following

R E P O R T

[To accompany S.J. Res. 34]

The Committee on Energy and Natural Resources, to which was referred the joint resolution (S.J. Res. 34) approving the site at Yucca Mountain, Nevada, for the development of a repository for the disposal of high-level radioactive waste and spent nuclear fuel, pursuant to the Nuclear Waste Policy Act of 1982, having considered the same, reports favorably thereon without amendment and recommends that the joint resolution do pass.

PURPOSE OF THE MEASURE

The purpose of S.J. Res. 34 is to approve the site at Yucca Mountain, Nevada for the development of a repository for the disposal of high-level radioactive waste and spent nuclear fuel pursuant to the Nuclear Waste Policy Act of 1982. Timely enactment of S.J. Res 34 will allow the Secretary of Energy to apply to the Nuclear Regulatory Commission for a license to build a repository at Yucca Mountain. Failure to enact the resolution within the 90-day period prescribed by the Act, on the other hand, will terminate the repository program established by the Act.

BACKGROUND AND NEED

Congress passed the Nuclear Waste Policy Act of 1982 to provide for the timely siting, construction, and operation of an underground repository for the permanent disposal of the nation's high-level radioactive waste and spent nuclear fuel. As used in the Act, the term "high-level radioactive waste" refers to the mixture of caustic chemicals and highly radioactive waste products that remain after uranium and plutonium have been chemically removed from spent nuclear fuel. Spent nuclear fuel refers to irradiated nuclear fuel

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that has been withdrawn from a nuclear reactor, but has not been "reprocessed" to separate and remove the uranium and plutonium from the waste products.

Sources and Volumes

The United States has been generating spent nuclear fuel and high-level radioactive waste since scientists discovered, six decades ago, that, when bombarded by neutrons in a nuclear reactor, some uranium atoms are transformed into a new element, plutonium, while others are split apart, producing highly radioactive waste products, radiation, and heat.

During the Second World War, the Army's Manhattan Engineer District built the Nation's first nuclear reactors at Hanford, Washington, for the purpose of producing plutonium. The Army began extracting plutonium from spent uranium fuel discharged from the first of these reactors in the final days of 1944. The plutonium was sent to Los Alamos, New Mexico, where it was fashioned into the atomic bomb that was tested at the Alamogordo air base on July 16, 1945, and the one that destroyed Nagasaki, Japan on August 9, 1945. The mixture of caustic chemicals and highly radioactive waste products that remained after the plutonium was removed was poured into a steel tank, near the Columbia River, until a better solution could be found.

The Federal Government, acting through the Army (1944–1946), the Atomic Energy Commission (1947–1974), the Energy Research and Development Administration (1975–1977), and the Department of Energy (1977–1988), continued to produce plutonium for nuclear weapons at Hanford, Washington and at Savannah River, South Carolina, for the next 44 years. The high-level radioactive waste resulting from the Government's plutonium production efforts at these two sites and, to a lesser extent, the recovery of uranium from spent fuel at the Idaho National Engineering and Environmental Laboratory in Idaho, is still stored in metal tanks at the three sites. These tanks were not designed to last forever. One of the oldest of the Hanford tanks began leaking in 1958 and 15 were leaking by 1973. There are about 100 million gallons of these wastes in tanks awaiting permanent disposal.

The Federal Government is also responsible for disposing of spent nuclear fuel from civilian nuclear power plants. The Government began encouraging electric utility companies to build nuclear power plants to produce electricity from uranium fuel in 1954. The first of these plants began operating at Shippingport, Pennsylvania in 1957. A total of 118 have been built, of which 104, at 72 sites 33 States, remain in operation. These plants have generated an estimated 45,000 tons of spent nuclear fuel and continue to generate another 2,000 tons every year.

Initially, both Federal policy makers and electric utility officials assumed that spent nuclear fuel from civilian nuclear power plants would be reprocessed to recover recyclable uranium and plutonium. By 1976, however, three separate attempts by private companies to build commercial plants to reprocess civilian nuclear power plant fuel had ended in failure. Both President Ford and President Carter opposed commercial reprocessing because of the nuclear proliferation risk it posed. President Reagan tried, unsuccessfully, to rekindle commercial interest in reprocessing, but unfavorable eco-

nomics discouraged any further attempts to build a commercial reprocessing plan in this country.

In place of reprocessing, in 1980, President Carter proposed a comprehensive national program to dispose of unreprocessed commercial spent nuclear fuel in "mined geologic repositories." Congress ultimately adopted this approach in the Nuclear Waste Policy Act of 1982. The Act required the Secretary of Energy to sign contracts with electric utility companies obligating the Government to take title to their spent nuclear fuel and to begin disposing of it in a geologic repository by January 31, 1998 in return for the payment of fees. The courts have since held that the contracts created a binding legal obligation on the Federal Government to dispose of the utilities' spent nuclear fuel.

In addition to commercial spent nuclear fuel, the Department of Energy stores about 2,500 metric tons of unreprocessed spent nuclear fuel from its plutonium production reactors, naval propulsion reactors, and foreign and domestic research reactors at Hanford, Savannah River, and the Idaho National Engineering and Environmental Laboratory.

The Search for a Solution

From the beginning of the nuclear weapons program, scientists and policy makers knew that tank storage of high-level radioactive waste was only a temporary solution, but they did not regard finding a permanent solution as an urgent necessity. In 1957, the National Academy of Sciences assured the Atomic Energy Commission that "radioactive waste can be disposed of safely in a variety of ways and at a large number of sites in the United States." Following the Academy's pronouncement, as Representatives Morris K. Udall later observed, "an opiate of confidence" descended upon Federal policy makers and rendered them "apathetic towards addressing" the serious technical, social, and political difficulties that finding a permanent solution to the nation's nuclear waste problem involves.

After more than 30 years of indecision and missteps, President Carter finally proposed a comprehensive and methodical approach to solving the problem in 1980. President Carter called for "an expanded and diversified program" aimed at "locating and characterizing a number of potential repository sites in a variety of different geologic environments with diverse rock types." After four or five sites had been thoroughly studied and found potentially suitable, one or more would be selected for development as a repository.

By 1982, a solid consensus had emerged around the major elements of the approach broadly outlined by President Carter and, in the words of the committee report on the House bill, "on the need for legislation to solidify a program and keep it on track." This consensus led to the passage of the Nuclear Waste Policy Act of 1982 in December of that year. President Reagan called the Act "a milestone for progress and the ability of our democratic system to resolve a sophisticated and divisive issue" when he signed it into law the following January.

As originally enacted, the Nuclear Waste Policy Act entrusted the Secretary of Energy with the task of choosing sites for the development of two deep geologic repositories for the permanent disposal of spent nuclear fuel and high-level radioactive waste. To do

this, the Act first required the Secretary of Energy to nominate at least five sites that he determined to be suitable for further examination, to evaluate them against general siting guidelines, and then to recommend three of the five to the President for more extensive examination of their geology.

In 1986, the Secretary selected Yucca Mountain as one of the three candidate sites for the first repository and ranked it as the most promising of the five nominated sites. In 1987, however, before the Secretary could characterize any of the three sites, Congress amended the Act to streamline the site selection program. Faced with mounting public opposition to the site selection process and the rapidly rising estimates of the cost of studying more than one site, Congress directed the Secretary to focus his siting efforts on Yucca Mountain alone, barred further consideration of the other two sites, and terminated the second repository program.

The Nuclear Waste Policy Act, amended in 1987, still required the Secretary of Energy to carry out "appropriate site characterization activities" at Yucca Mountain to determine if the site is suitable for the development of a repository. Based upon the extensive body of scientific information about Yucca Mountain collected during the site characterization process and the years leading up to the formal characterization process, the Secretary decided that the site is suitable and, on February 14, 2002, recommended the site to the President. On the following day, the President determined that the Yucca Mountain site is "qualified for application for a construction authorization for a repository," and recommended the site to Congress.

The Need for a Repository

A geologic repository is needed to isolate high-level radioactive waste and spent nuclear fuel from the public and the environment. Given adequate resources and vigilance, these wastes could, of course, continue to be stored above ground, as they have been over the past 58 years, in metal tanks, concrete pools, and metal canisters. But surface storage methods require constant monitoring and ongoing maintenance to ensure their integrity. Continued reliance on such methods would shift the burden of perpetual maintenance to future generations. The final environmental impact statement on the Yucca Mountain project notes that permanent at-reactor storage would require complete replacement of the storage canisters every 100 years or they will "eventually release radioactive materials to the environment, contaminating the atmosphere, soil, surface water, and groundwater. * * *" As the National Academy of Sciences concluded last year, "After four decades of study, geological disposal remains the only scientific and technically credible long-term solution available to meet the need for safety without reliance on active management."

The Governor's Veto and the Need for the Resolution

The Nuclear Waste Policy Act provides that, once the Secretary of Energy recommends the Yucca Mountain site to the President, and the President recommends it to Congress, the Governor of Nevada has the opportunity to submit a "notice of disapproval" to Congress, along with "a statement of reasons explaining why" he objects to the recommended site. On April 8, the Governor of Ne-

vada exercised this authority and submitted a notice of disapproval and statement of reasons.

Under the terms of the Nuclear Waste Policy Act, the Governor's notice will have the effect of terminating further consideration of the Yucca Mountain site for the repository unless both Houses of Congress pass, and the President signs into law, a joint resolution approving the site within 90 days of continuous session after the notice of disapproval was received. The House of Representatives passed such a resolution on May 8, 2002. If the Senate fails to pass the resolution by the statutory deadline (estimated to fall on or about July 25), the Governor's veto of the President's site recommendation will stand, and the Secretary will be barred from applying to the Nuclear Regulatory Commission for a license to build the repository at Yucca Mountain. The Nuclear Waste Policy Act does not permit the Secretary to consider sites other than Yucca Mountain. If the Senate fails to act and thereby sustains the Governor's veto, the 45,000 metric tons of commercial spent nuclear fuel, the 2,500 metric tons of spent nuclear fuel from naval, research and production reactors, and the 100 million gallons of high-level radioactive defense waste will remain where they are now stored indefinitely.

LEGISLATIVE HISTORY

S.J. Res. 34 is rooted in section 115 of the Nuclear Waste Policy Act of 1982, which prescribes its text and the rules for its consideration by the Senate. It was introduced by Senator Bingaman (by request) on April 9 in accordance with section 115(d)(2)(A) of the Act and referred to the Committee on Energy and Natural Resources on the same day in accordance with section 115(d)(2)(B).

The Committee held three days of hearings on the resolution to approve the President's site recommendation. On May 16, 2002, the Secretary of Energy testified in support of the resolution and the President's recommendation. The Committee invited the Governor of Nevada to testify in opposition to the President's recommendation, but the Governor was unable to attend. A panel of witnesses chosen by the two Senators from Nevada to represent the views of the State from Nevada testified in the Governor's place on May 22 and an additional witness represented Nevada's views on May 23. The Nuclear Regulatory Commission, the Chairman of the Nuclear Waste Technical Review Board, the Assistant Secretary for Air and Radiation of the Environmental Protection Agency, and the Director of the Natural Resources and Environment Team of the General Accounting Office also testified on May 23.

Representative Tauzin introduced an identical measure (H.J. Res. 87) in the House of Representatives on April 11, 2002. It was ordered reported by the Committee on Energy and Commerce on April 25, 2002 by a vote of 41 to 6 (H. Rept. 107–425). The House of Representatives passed H.J. Res. 87 on May 8, 2002 by a vote of 306 to 117. H.J. Res. 87 was received in the Senate and placed on the Calendar (Calendar No. 368) on May 9, 2002 pursuant to section 115(d)(5)(A) of the Nuclear Waste Policy Act of 1982.

The Committee on Energy and Natural Resources considered S.J. Res. 34 at its business meeting on June 5, 2002.

Based upon our understanding of the purpose of the State veto provisions of the Nuclear Waste Policy Act and the intent of the framers of the Act, we view the Committee's fourfold:

(A) to review the Governor's statement of reasons and supporting testimony and documents to determine if the Governor has raised an objection sufficient to eliminate Yucca Mountain from consideration or warrant terminating the repository program at this point;

(B) to review the President and Secretary's site recommendation and supporting testimony and documents to determine if the Administration has made a case for allowing the program to go forward to the next step—applying to the Nuclear Regulatory Commission for authorization to construct the repository;

(C) to determine whether proceeding with the repository program over the objections of the State is in the national interest; and, finally,

(D) to determine whether to recommend that the Senate pass the resolution approving the President's site recommendation.

A. The Governor's Objections

The statement of reasons accompanying the Governor of Nevada's notice of disapproval of the President's site recommendation states that the recommendation is "based on bad science, bad law, and bad public policy."

Under the heading of science, the Governor asserts that: (1) Yucca Mountain is "geologically unfit" to isolate nuclear waste; (2) the repository's design relies too heavily on engineered barriers to contain radionuclides; (3) the computer models assessing the repository's performance are too uncertain; and (4) the design of the repository is still unfinished.

Under the heading of law, the Governor notes that the State of Nevada has filed several lawsuits against the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Nuclear Regulatory Commission (NRC) over various aspects of the repository program. The only legal argument he develops before the Committee is (5) that the DOE changed its site suitability guidelines because, he says, Yucca Mountain could not meet the original ones.

Under the heading of policy, the Governor argues that: (6) the repository will not eliminate the need to store nuclear waste at other sites; (7) shipping nuclear waste to Yucca Mountain will pose serious transportation risks; and (8) leaving nuclear waste where it is now stored is a preferable alternative.

In a statement filed for the record after the Committee completed its hearings, the Governor raises two new objections. They are: (9) that an international peer review of the Yucca Mountain project has found that "DOE lacks sufficient information * * * to predict the suitability and hydrogeologic performance of the proposed repository"; and (10) that the NRC will not examine or determine the geologic suitability of Yucca Mountain in its licensing proceeding.

The Committee considers each of these ten issues in turn.

1. The Geology of the Site

The Governor asserts that Yucca Mountain is "geologically unfit" for the repository because it "appears to be at the center of one of the most potentially active volcanic areas in the West," it "sits dead-center in one of the largest earthquake vault zones east of California," and it is "porous to water," with "rapid groundwater flow * * * more than 100 times greater than was expected."

The Secretary of Energy paints an entirely different picture of Yucca Mountain. He describes the site as "geologically stable, in a closed groundwater basin, isolated on thousands of acres of Federal land," far from any metropolitan area. He further says the site is "in the middle of a desert," with little rainfall, most of which evaporates, and little groundwater flow.

The Secretary's view finds substantial support in the views of the United States Geological Survey (USGS). In a letter in the record before the Committee, the Director of the USGS, Dr. Charles Groat, states that "the USGS believes that the scientific work performed to date supports a decision to recommend Yucca Mountain for development as a nuclear waste repository." Dr. Groat lists the site's "arid climate; the very low rate of infiltration of precipitation into the subsurface; the small percentage of infiltrating water that could actually seep into" the repository; and the great distance to the water table as some of the many "inherent natural attributes of the site." While acknowledging the possibility of earthquakes and volcanic eruptions, Dr. Groat says that "the USGS has confidence in the probabilistic earthquake hazard analyses upon which" the repository's design will be based, and that the USGS believes that "the probability of a repository-piercing" volcanic eruption "is very low."

Dr. Groat states that the USGS has found "no feature or characteristic of the site that would preclude recommending" it. That view is echoed by the Chairman of the Nuclear Waste Technical Review Board, who testified that "no individual technical or scientific factor has been identified that would automatically eliminate Yucca Mountain from consideration at this point." Based on the weight of expert opinion before it, the Committee cannot conclude that the Yucca Mountain site is geologically unsuitable for development of the repository.

2. Reliance on Engineered Barriers

The Governor claims that the geology of Yucca Mountain is so bad that DOE has had to abandon "the very concept of geologic isolation" and resort to "a series of fancy engineered waste packages" and a "tangled web of man-made contrivances * * * to compensate for the stunning geological surprises at Yucca Mountain."

The Secretary of Energy firmly rejected these characterizations in his appearance before the Committee and testified that the concept of deep geologic disposal has always contemplated a combination of natural, geologic barriers and engineered barriers. In addition, his written recommendation to the President explains that the natural barrier provided by the geology of Yucca Mountain will, most likely, prevent water from reaching the waste and transporting radionuclides out of the repository and into contact with people. Even if it does not, the Secretary contends, the combination of engineered barriers afforded by the proposed titanium drip

shields, the corrosion-resistant waste packages, and the waste form itself (metal-clad ceramic pellets in the case of spent nuclear fuel and glass in the case of high-level radioactive waste) will prevent the escape of radionuclides. Moreover, the Secretary states that even assuming the failure of all of these barriers the annual dose to the public will still meet the radiation protection standards set by the EPA and the NRC.

The Committee agrees with the Secretary that the concept of deep geologic disposal has always contemplated reliance on a combination of geologic and engineered barriers to ensure the safe containment radionuclides in a repository. (See H. Rept. 97–491, part 1, at 30.) The Nuclear Waste Policy Act not only allows but requires the Secretary to consider engineered barriers, including the form and packaging of the nuclear waste, in making his site recommendation to the President. (42 U.S.C. 10134(a)(1)(B).) The NRC's licensing rule requires the repository to include "both natural barriers and an engineered barrier system." (10 C.F.R. 63.113(a).)

Whether the combination of natural and engineered barriers proposed by the Secretary will meet the licensing requirements of the NRC will ultimately be for the Commission, rather than this Committee, to decide. But the Committee believes that the Secretary's reliance on a combination of natural and engineered barriers is both permissible and appropriate.

3. Computer Models

The Governor asserts that "DOE's computer models of Yucca Mountain repository performance and radiation emissions currently have an uncertainty factor of up to 10,000."

The quality of DOE's computer models is a serious concern because the NRC's licensing decision must ultimately depend upon them. DOE must show the Commission that the repository will meet EPA's radiation protection standards for 10,000 years. Absolute proof of the repository's ability to comply is, as the NRC, EPA, and the Technical Review Board agree, unattainable. Compliance with the NRC's licensing standards will only be demonstrated through complex computer models of the repository's future performance supported by the limited data that is available.

Although some measure of uncertainty is inevitable in this approach, the Committee is concerned that DOE's performance assessment models may not provide enough assurance to support the NRC's licensing decision. The Chairman of the Nuclear Waste Technical Review Board testified that "the technical basis for the DOE's repository performance estimates is weak to moderate at this time," and that "the Board has limited confidence in current performance estimates generated by the DOE's performance assessment model." At the same time, Dr. Cohon testified that the Board has identified several ways DOE can improve its performance assessments and that DOE has made progress in these areas. He also said that the Board's view "would likely improve" if DOE implements all of the Board's recommendations.

The Committee takes the Board's criticisms very seriously. They serve notice that DOE must improve the quality of its performance assessment models or run the risk of not being able to sustain its burden of proof in an NRC licensing proceeding. Nonetheless, we

do not believe, and we do not read the Board's testimony as suggesting, that the current weaknesses in DOE's performance assessment models warrant disapproval of the President's decision to proceed with the Yucca Mountain site or termination of the repository program at this point.

4. Completeness of the Design

The Governor states that "DOE has yet to finish the very design of the Yucca Mountain repository," and cities "293 unresolved technical issues in 9 critical areas." As a result, as both Dr. Gilinsky (testifying on behalf of the State of Nevada) and the General Accounting Office point out, DOE will be unable to submit a license application to the NRC until 2004 and will not comply with the statutory requirement that it file an application within 90 days after Congress approves the President's site recommendation.

The Committee agrees with the Secretary that the Nuclear Waste Policy Act, at least implicitly, requires him to determine if the Yucca Mountain site is "suitable" for the development of the repository before he recommends it to the President and the President recommends it to Congress, but it does not require him to have satisfied every requirement for the issuance of a license before making his site recommendation. The important question, as the Chairman of the Nuclear Regulatory Commission testified, is whether sufficient information will exist to permit the Commission to begin its licensing review once DOE files its license application. In response to this question, the NRC Chairman testified that the Commission is "confident that DOE can assemble the information necessary for an application that NRC can accept for review." The "293 unresolved technical issues" referred to by the Governor (which the Secretary pointed out have already been reduced to 252) reflect commitments DOE has made to provide additional information to the NRC on specific issues.

The fact that DOE will not be able to file a license application within 90 days after Congress approves the President's site recommendation is regrettable but not unexpected in a program that is already at least 12 years behind schedule. The 90-day provision in section 114(b) of the Nuclear Waste Policy Act is directory rather than mandatory and does not affect the Secretary's ability to file an application, or the Commission's ability to act on it, at a later date. (*See* 3 Sutherland, Statutory Construction § 57:19 (2001 rev.).)

5. The Siting Guidelines

The Governor contends that DOE changed its original siting guidelines because Yucca Mountain could not meet them. The Governor, supported by Dr. Gilinsky's testimony and Dr. Bartlett's affidavit, argues that the new guidelines make the geology of the site irrelevant.

The Secretary firmly rejected this characterization of events in his testimony before the Committee and in his written recommendation to the President. The Secretary states that the guidelines were changed "to conform to changes in the statutory and regulatory framework governing the siting process and the scientific consensus regarding the best approach for assessing the likely performance of a repository over long periods of time."

The history of the siting guidelines supports the Secretary's stance. The original siting guidelines were "general guidelines" designed to help the Secretary compare multiple "candidate sites for recommendation" for site characterization. They served this purpose when, in 1986, the Secretary ranked Yucca Mountain as the most promising of the five candidate sites it evaluated under the guidelines. But they were of no further use once Congress itself selected Yucca Mountain as the only site for characterization in 1987 and the Secretary was not required to use the general guidelines as the basis for determining whether Yucca Mountain is suitable for development as a repository. Nonetheless, in 1988, the Secretary chose to do so.

In 1992, however, Congress required the Environmental protection Agency to adopt radiation protection standards for Yucca Mountain, and the Nuclear Regulatory Commission to modify its licensing requirements for Yucca Mountain, consistent with the recommendations of the National Academy of Sciences. Among other things, the Academy recommended that Yucca Mountain be judged on the basis of its performance as a "total system," and not on the basis of multiple "subsystem performance requirements." The Committee agrees with the Secretary that, once the EPA and the NRC had adopted licensing standards based on total system performance, "DOE had no choice but to amend its Guidelines to conform with the new regulatory framework established at Congress's direction by the National Academy of Sciences, the EPA, and the NRC."

6. The One Site "Myth"

The Governor assails the argument the Secretary made in his recommendation to the President that a single underground repository at Yucca Mountain is preferable to "131 aging surface sites, scattered across 39 states." The Governor points out that it will take DOE decades to move spent nuclear fuel from the existing nuclear power plants to the repository, during which time it will remain where it is now stored. Moreover, he notes that the problem will be compounded if additional nuclear power plants are built in the future.

The Committee accepts the logic of the Governor's argument, but not the conclusion he draws from it. We agree with the Governor that, even if the repository can be licensed and built in accordance with the Secretary's schedule, it will take years to begin, and decades to complete the shipment of high-level radioactive waste and spent nuclear fuel to it. But we do not see that as a reason to abandon the Nation's commitment to the permanent disposal of these wastes in an underground repository. We agree with the National Academy of Sciences that "geological disposal remains the only scientifically credible long-term solution available to meet the needs for safety without reliance on active management." We see no reason to abandon the commitment to geological disposal Congress made twenty years ago.

7. Transportation

One of the principal arguments made by the Governor and the witnesses who testified in support of his position is that high-level radioactive waste and spent nuclear fuel cannot be transported to the repository safely, that shipping this material to the repository

will be an enormous undertaking for which the DOE is ill-prepared, and that such shipments will invite terrorist attacks.

The Committee agrees with the Governor on the enormity of the undertaking and on the need for far more planning, training, analysis, and testing than has been done to date. The Committee does not agree, however, that the challenges of shipping nuclear waste to the repository are unsurmountable or that such shipments need endanger the public health and safety or the environment. The Secretary testified that over 2,700 shipments of spent nuclear fuel have been made safely over the past 30 years. Both the Nuclear Regulatory Commission and the Department of Transportation, the two agencies responsible for regulating the transportation of nuclear waste, testified that it can be safely and securely transported. The Committee fully expects that DOE and its regulators can and will take all precautions necessary to ensure that the transportation of spent nuclear fuel and high-level radioactive waste is conducted in a safe and secure manner. The Committee has no reason to believe that they will not take such actions as may be necessary to protect the public health and safety and the common defense and security before any shipments are made to the repository.

8. On-site Storage

The Governor proposes that, instead of building a deep geologic repository at Yucca Mountain, DOE take title to the utilities' spent nuclear fuel and pay the utilities to store it where it is now, at the nuclear power plants that generated it. He further suggests that DOE use the money that the utilities paid DOE to dispose of their waste at Yucca Mountain to pay them to keep it themselves. The Governor notes that DOE has already adopted this approach with respect to the spent nuclear fuel at the Peach Bottom plant in Pennsylvania to settle a lawsuit with the plant's owner, PECO Energy.

The Governor's proposal does not offer a permanent solution to the Nation's nuclear waste management problem. It would relinquish the progress that has been made over the past 20 years and return us to the policy of wishfully waiting, Macawber-like, for something to turn up. It would offer no relief to nuclear power plants that have already shut down, no relief to plants that are running out of room to store spent fuel on site or may not be able to get State approval to store spent nuclear fuel on site, and no relief to the states with DOE facilities that are currently storing high-level radioactive waste or spent nuclear fuel from naval reactors or foreign or domestic research reactors. It would repudiate binding agreements with the States to remove spent nuclear fuel and high-level radioactive waste from DOE sites, and with the utilities to remove spent nuclear fuel from their plants. As already noted, permanent on-site storage will require costly, on-going maintenance or it will lead to the eventual release of radioactive material into the environment. We find nothing in the record before us that warrants adopting such a course.

9. The International Peer Review Report

The Governor quotes four critical excerpts from an international peer review of DOE's performance assessment for the Yucca Mountain site recommendation. The peer review was conducted, at

DOE's request, by an International Review Team from the International Atomic Energy Agency and the Nuclear Energy Agency of the Organization for Economic Co-operation and Development. The passages quoted by the Governor are critical of DOE's understanding of the hydrogeology of Yucca Mountain and DOE's computer models.

The Committee does not believe the passages selected by the Governor fairly reflect the overall thrust of the report. While the report criticizes DOE's performance assessment in some respects, it praises DOE's work in others, calling DOE's models "an impressive body of work," which is "in line with international best practice." The Committee believes that the International Review Team's views are more fairly captured in the Team's own "statement regarding the adequacy of the overall performance assessment approach for supporting the site recommendation decision":

> *While presenting room for improvement, the TSPA–SR* [Total System Performance Assessment supporting the Site Recommendation] *methodology is soundly based and has been implemented in a competent manner. Moreover, the modeling incorporates many conservatisms, including the extent to which water is able to contact the waste packages, the performance of engineered barriers and retardation provided by the geosphere.*
>
> *Overall, the IRT* [International Review Team] *considers that the implemented performance assessment approach provides an adequate basis for supporting a statement on likely compliance within the regulatory period of 10,000 years and, accordingly, for the site recommendation decision.*
>
> *On the basis of a growing international consensus, the IRT stresses that understanding of the repository system and its performance and how it provides for safety should be emphasized more in future iterations, both during and beyond the regulatory period. Also, further work is required to increase confidence in the robustness of the TSPA* (Emphasis in original.)

10. Consideration of Geology by the NRC

Finally, the Governor contends that the "NRC will not be examining or determining the geologic suitability of the Yucca Mountain site * * *[,] only whether DOE's man-made waste packages can keep radiation emissions to within standards set by the Environmental Protection Agency." Dr. Gilinsky, a former member of the NRC and now a consultant to the State of Nevada, made a similar claim in his testimony before the Committee.

The Committee asked the Chairman of the Nuclear Regulatory Commission about Dr. Gilinsky's claim. Dr. Meserve replied that "Mr. Gilinsky's testimony may reflect some misunderstanding of both the statue and of our regulatory requirements, in that the statute requires a consideration of both natural and engineered barriers, as do our regulatory requirements.* * *" Dr. Meserve conceded that the NRC does not impose separate requirements for natural and engineered barriers, but that is consistent with the advice the Commission "received from the National Academy of Sciences that the [repository] system should be viewed as an integrated

whole and that all of the barriers should work synergistically with each other, and that we should see the integrated picture rather than looking at each barriers in isolation."

The Committee is satisfied that the NRC will required DOE to demonstrate that the "natural features of the geologic setting," working in combination with the engineered barrier system, will isolate radionuclides in the repository in accordance with the Commission's licensing rule.

The Committee Findings on the Governors's Objections

The Governor raises serious questions about the geology of the Yucca Mountain site, the design of the repository, the credibility of DOE's performance assessments, and the safety of nuclear waste transportation. These questions must be more fully examined and resolved before the NRC can authorize construction of the repository. But they should be resolved by the Commission, rather than by the Committee or the Senate as a whole. We cannot find on the basis of the record before us that any of the objections raised by the Governor warrants termination of the repository program at this point.

It bears repeating that enactment of the joint resolution will not authorize construction of the repository or allow DOE to put any radioactive waste or spent nuclear fuel in it or even allow DOE to begin transporting waste to it. Enactment of the joint resolution will only allow DOE to take the next step in the process laid out by the Nuclear Waste Policy Act and apply to the NRC for authorization to construct the repository at Yucca Mountain. As Senator Henry M. Jackson noted during the debate on the Act in 1982, "the licensing process of the Nuclear Regulatory Commission provides a further insurance to the State that is legitimate concerns for the public health and safety will be met. Beyond the Nuclear Regulatory Commission, there is, of course, the full recourse to the judicial process to insure that the Nuclear Regulatory Commission exercises its proper role in protecting the public health and safety. These considerations in themselves constitute a considerable protection for the State and its citizenry beyond the point in the process at which a construction permit application is filed."

B. The Case for Going Forward

The Committee believes that the Secretary's recommendation to the President, combined with his testimony before the Committee, and the voluminous technical documents supporting the recommendation meet the burden of going forward imposed by the Act and are sufficient to justify allowing the Secretary to submit a license application for the repository to the Nuclear Regulatory Commission for its review.

The Committee finds support for its view in the testimony of the agencies charged with overseeing and regulating the repository program. The Chairman of the Nuclear Waste Technical Review Board, which Congress established in 1987 to evaluate the technical and scientific validity of DOE's site characterization and transportation activities, testified that "no individual technical or scientific factor has been identified that would automatically eliminate Yucca Mountain from consideration at this point. * * *" The Assistant Administrator for Air and Radiation of the Environ-

mental Protection Agency testified that "EPA believes that disposal in compliance with the EPA standards will be fully protective of public health and the environment." The Chairman of the Nuclear Regulatory Commission testified that "the Commission believes that deep geological disposal is appropriate for high-level radioactive wastes and spent nuclear fuel and that such wastes can be safely and securely transported to a disposal location." While careful not to prejudge the Commission's licensing decision, Dr. Meserve testified that, "based on our technical reviews and pre-licensing interactions," the Commission is "confident that DOE can assemble the information necessary for an application that NRC can accept for review."

C. The National Interest

Twenty years ago, the 97th Congress found that "a national problem had been created by the accumulation of" spent nuclear fuel from commercial nuclear power plants and high-level radioactive waste from national defense activities, and that efforts to deal with this problem over the preceding 30 years had been inadequate. It further found that "radioactive waste creates potential risks and requires safe and environmentally acceptable methods of disposal." It responded to this problem by establishing the present program for the orderly, step-by-step program for the siting, licensing, and construction of a deep geologic repository that will "not rely on human monitoring and maintenance to keep the wastes from entering the biosphere" and will "ensure that such waste and spent fuel do not adversely affect the public health and safety and the environment of this or future generations." It also committed to meeting both our military and civilian radioactive waste responsibilities in the present, by the generation that benefitted from the nuclear activities that created the waste, so that they would not become a burden on future generations.

The Committee finds that continued progress towards the permanent disposal of high-level radioactive waste and spent nuclear fuel in a deep geologic repository that will isolate these wastes from the accessible environment remains in the national interest. None of the arguments presented to the Committee outweigh the national interest in proceeding with this program or warrant abandoning it at this stage.

COMMITTEE RECOMMENDATION AND TABULATION OF VOTES

The Senate Committee on Energy and Natural Resources, in open business session on June 5, 2002, by majority vote of a quorum present, recommends that the Senate pass S.J. Res. 34.

The rollcall vote on reporting the measure was 13 yeas, 10 nays as follows:

YEAS	NAYS
Mr. Bingaman	Mr. Akaka
Mr. Graham	Mr. Dorgan
Ms. Landrieu*	Mr. Wyden
Mr. Murkowski	Mr. Johnson
Mr. Domenici	Mr. Bayh*
Mr. Nickles	Mrs. Feinstein
Mr. Craig	Mr. Schumer

Mr. Thomas
Mr. Shelby*
Mr. Burns
Mr. Kyl
Mr. Hagel
Mr. Smith
Mr. Cantwell
Mr. Carper
Mr. Campbell

*Indicates vote by proxy.

COST AND BUDGET CONSIDERATIONS

The following estimate of costs of this measure has been provided by the Congressional Budget Office.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, June 5, 2002.

Hon. JEFF BINGAMAN,
Chairman, Committee on Energy and Natural Resources,
U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for S.J. Res. 34, a bill approving the site at Yucca Mountain, Nevada, for the development of a repository for the disposal of high-level radioactive waste and spent nuclear fuel, pursuant to the Nuclear Waste Policy of 1982.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contacts are Lisa Cash Driskill (for federal costs), and Elyse Goldman (for the state and local impact).

Sincerely,

STEVEN LIEBERMAN
(For Dan L. Crippen, Director).

Enclosure.

S.J. Res. 34—Approving the site at Yucca Mountain, Nevada, for the development of a repository for the disposal of high-level radioactive waste and spent nuclear fuel, pursuant to the Nuclear Waste Policy Act of 1982

Summary: S.J. Res. 34 would provide Congressional approval of the site at Yucca Mountain, Nevada, for the storage of nuclear waste. In accordance with the Nuclear Waste Policy Act (NWPA), such approval would allow the Department of Energy (DOE) to apply for a license with the Nuclear Regulatory Commission to construct a nuclear waste storage facility on the approved site. Enacting S.J. Res 34 would not alter the contractual relationship between DOE and those electric utilities with nuclear power plants to dispose of nuclear waste in exchange for the payment of annual fees. The resolution would not affect direct spending or receipts, so pay-as-you-go procedures would not apply.

Congressional approval of the Yucca Mountain site is required before DOE can proceed with its plans to spend about $10 billion over the next several years to develop the Yucca Mountain site and begin receipt of waste in 2010. Based on information from DOE, CBO estimates that implementing S.J. Res 34 would require the appropriation of about $12 billion over the 2003–2012 period, to pay for licensing, construction, and waste transportation activities over that period. All such spending is subject to appropriation.

S.J. Res. 34 could increase the costs that Nevada and some local governments would incur to comply with certain existing federal requirements. The Unfunded Mandates Reform Act (UMRA) is unclear about whether such costs would count as new mandates under UMRA. In any event, CBO estimates that the annual direct costs incurred by state and local governments over the next five years would total significantly less than the threshold established in the law ($58 million in 2002, adjusted annually for inflation). S.J. Res. 34 contains no new private-sector mandates as defined in UMRA.

Estimated cost to the Federal Government: The estimated budgetary impact of S.J. Res. 34 is shown in the following table. The costs of this legislation fall within budget functions 270 (energy) and 050 (defense).

	By fiscal year, in millions of dollars—					
	2002	2003	2004	2005	2006	2007
SPENDING SUBJECT TO APPROPRIATION						
Spending Under Current Law for Nuclear Waste Disposal:						
Budget Authority[1]	375	0	0	0	0	0
Estimated Outlays	366	48	0	0	0	0
Proposed Changes:						
Estimated Authorization Level	0	527	900	1,100	1,500	2,000
Estimated Outlays	0	369	788	1,040	1,380	1,850
Spending Under S.J. Res. 34 for Nuclear Waste Disposal:						
Estimated Authorization Level	375	527	900	1,100	1,500	2,000
Estimated Outlays	366	465	788	1,040	1,380	1,850

[1] The 2002 level is the amount appropriated for that year.

Basis of estimate: If the Congress enacts S.J. Res. 34, DOE expects that it would apply for a license to construct a storage facility at Yucca Mountain sometime in 2004 and that the site would be ready to accept nuclear waste in 2010. The Department of Defense and DOE have requested $527 million for this program for fiscal year 2003. Based on information contained in DOE's May 2001 report, Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program, CBO estimates that implementing the resolution would require the appropriation of about $6 billion over the 2003–2007 period and about $12 billion over the 2003–2012 period to prepare the site to dispose of waste. This estimate includes program management, licensing, construction, and transportation of waste to the site.

In accordance with the NWPA, on February 15, 2002, the President recommended to the Congress that Yucca Mountain, Nevada, be used for the storage of nuclear waste. Also in accordance with the NWPA, on April 9, 2002, the Governor of Nevada provided the Congress with a notice of disapproval of the site. Following the Governor's disapproval notice, the Congress is now deciding whether to enact legislation approving the site. Without such legislation, the notice of disapproval would stand, and there would be no further consideration of a nuclear waste storage facility at Yucca Mountain.

Spending on nuclear waste disposal activities would very likely continue in the absence of S.J. Res. 34, but CBO has no basis for estimating the likely level of such spending. If S.J. Res. 34 were not enacted, spending on the nuclear waste program could be higher or lower than shown in the above table, depending on how the

program might be restructured. If Yucca Mountain is not used as a nuclear waste repository, such spending might include funding for interim storage, further study of alternative disposal sites, or other program options.

In the May 2001 report, DOE estimates the future cost to conduct the nuclear waste program is about $50 billion, in constant 2000 dollars, for 2001 through closure and decommissioning of Yucca Mountain in 2119. According to DOE, about $9 billion has been spent since 1983 studying nuclear waste disposal sites and preparing a recommendation for use of the Yucca Mountain site.

Pay-as-you-go considerations: None.

Estimated impact on state, local, and tribal governments: While the resolution, by itself, would establish no new enforceable duties on state, local, or tribal governments, shipments of nuclear waste to the Yucca Mountain site would increase costs to the state of Nevada for complying with other existing federal requirements. Additional spending by the state would support a number of activities, including emergency communications, emergency response planning and training, inspections, and escort of waste shipments. UMRA is unclear about whether such impacts on other existing federal requirements would count as new mandates under UMRA. In any event, CBO estimates that the annual direct costs incurred by state and local governments over the next five years would total significantly less than the threshold established in the law ($58 million in 2002, adjusted annually for inflation).

Estimated impact on the private sector: S.R. Res. 34 contains no new private-sector mandates as defined in UMRA.

Previous CBO estimate: On April 30, 2002, CBO transmitted a cost estimate for H.J. Res. 87, a similar resolution, as ordered reported by the House Committee on Energy and Commerce on April 25, 2002. The cost estimates for these two resolutions are identical.

Estimate prepared by: Federal Costs: Lisa Cash Driskill; Impact on State, Local, and Tribal Governments: Elyse Goldman; and Impact on the Private Sector: Lauren Marks.

Estimate approved by: Peter H. Fontaine, Deputy Assistant Director for Budget Analysis.

REGULATORY IMPACT EVALUATION

The bill is not a regulatory measure in the sense of imposing Government established standards or significant economic responsibilities on private individuals and businesses.

No personal information will be collected in administering the program. Therefore, there will be no impact on personal privacy.

Little, if any, additional paperwork will result from the enactment of S.J. Res. 34.

EXECUTIVE COMMUNICATIONS

The text of the letter from the Secretary of Energy to the President of the Senate transmitting the proposed text of the joint resolution and requesting prompt and favorable action by the Senate thereon is set forth below:

THE SECRETARY OF ENERGY,
Washington, DC, April 9, 2002.

Hon. RICHARD B. CHENEY,
President of the Senate,
Washington, DC.

DEAR MR. PRESIDENT: I transmit herewith a proposed joint resolution that would approve, pursuant to the Nuclear Waste Policy Act of 1982, the President's recommendation of February 15, 2002 that the Yucca Mountain site be designated as the location for a potential repository for spent nuclear fuel and high-level radioactive waste. Enactment of this joint resolution is necessary to allow expert scientific and technical examination of the safety of the site by the Nuclear Regulatory Commission.

The President's recommendation and the supporting Department of Energy materials accompanying it reflect over two decades of publicly available and transparent scientific examination of this site. That examination, conducted over 24 years at a cost of more than $4 billion, occurred with benchmark analyses by the National Academy of Sciences and with a view to compliance with extremely rigorous Environmental Protection Agency standards. The overwhelming weight of scientific evidence has now confirmed the suitability of the site, and thereby has confirmed the choice made by Congress 15 years ago, in 1987, that the Government direct its scientific inquiry exclusively to the Yucca Mountain site.

In addition to the sound science that supports this project—a prerequisite for moving forward—fundamental national security and energy policy considerations weigh heavily in favor of proceeding with the Yucca Mountain program. Spent fuel from our nuclear-powered aircraft carriers and submarines must be permanently disposed of if we are to continue using their special capabilities.

The project is critical for energy security as well. Nuclear power provides 20 percent of the nation's electricity and emits no airborne pollution or greenhouse gases. The reactors we have today give us one of the cheapest and most reliable forms of power generation we have. Securing the benefits of this form of energy requires finding a permanent, safe and secure site for disposal of spent nuclear fuel.

Yucca Mountain is essential for homeland security. More than 161 million people live within 75 miles of one or more nuclear waste sites, all of which were intended to be temporary. We believe that today these sites are safe, but prudence demands we consolidate this waste from widely dispersed above-ground sites into a deep underground location that can be better protected.

Twenty years ago Congress established that safe disposal of spent nuclear fuel and high-level nuclear waste is a responsibility of the Federal Government. The next step toward fulfilling this responsibility to the future is to permit the Yucca Mountain site to be designated, as the Nuclear Waste Policy Act contemplates, so that its actual safety as a site for a particular repository can be evaluated by the independent and neutral experts at the Nuclear Regulatory Commission.

I urge the Congress to act promptly and favorably on the proposed joint resolution so that the next stage of addressing the mer-

its of all remaining issues, by applying the independent expertise of the Nuclear Regulatory Commission, can begin in earnest.

Sincerely,

SPENCER ABRAHAM.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, the Committee notes that no changes in existing law are made by S.J. Res. 34 as ordered reported.

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