UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD
1100 Wilson Boulevard. Suite 910
Arlington, VA 22209

July 20, 1995

The Honorable Frank Pallone, Jr.
Ranking Member
Subcommittee on Energy and Power
Committee on Commerce
U.S. House of Representatives
Raybum House Office Building
Room 2125
Washington, D.C. 20515-6115

Dear Representative Pallone:

I appreciated the opportunity to present testimony on behalf of the Nuclear Waste Technical Review Board at the June 30, 1995, oversight hearing by the Subcommittee on Energy and Power on the proposed permanent repository at Yucca Mountain, Nevada.

On behalf of the Board, I am submitting answers to the questions you sent to me on July 12. I request that these answers, as well as the enclosed answers to questions submitted to the Board by Representative Edward J. Markey appear in the printed record of the hearings to accompany my prepared remarks. Thank you.

Sincerely,

John E. Cantlon

John E. Cantlon
Chairman

Enclosure

cc: The Honorable Dan Schaefer, Chairman
Subcommittee on Energy and Power

Telephone: 703-235-4473 Fax: 703-235-4495

Subcommittee on Energy and Power
Committee on Commerce
U.S. House of Representatives
Hearing on High-level Nuclear Waste Policy
June 28, 1995

U.S. Nuclear Waste Technical Review Board
Answers to questions the record

Questions from Representative Frank Pallone, Jr.

1. *In your testimony, you commended DOE for improving its high-level nuclear waste repository program, and stressed the need for stability in terms of Congress's directives regarding this program*

   a. *What impact do you think legislation directing DOE to develop interim storage by 1998 would have on its existing repository program? Assuming adequate funding do you think the Department can handle both of these managerial responsibilities simultaneously?*

Ans. Developing interim storage should not present a major technical challenge to the Office of Civilian Radioactive Waste Management (OCRWM). Sufficient technical and management experience exists in this area within other parts of the Department of Energy (DOE) from which the OCRWM can draw.

However, if in addition to the repository program, the OCRWM were directed to develop a storage facility for commercial spent fuel, the activities involved in carrying out this mandate could distract the OCRWM from its current focus on disposal, especially from characterizing the site at Yucca Mountain. Management structures — both within the OCRWM and within its contractor family — would have to be created to deal with spent fuel storage. The OCRWM has made slow progress during the last five years in instituting a focused and disciplined management team for the disposal program. Adding significant new responsibilities could undermine that progress.

Directing the DOE to develop a storage facility by 1998 — without a commensurate increase in funding for storage activities — will almost surely delay the repository program. Furthermore, because the costs associated with an ambitious storage program will increase as the DOE moves toward constructing and operating a facility and begins transporting the spent fuel, competition between storage and disposal activities for funding will become more intense. Congress could mitigate the competition for funding by choosing to provide the funding required for the development of both storage and disposal facilities.

b. Assuming adequate funding, do you think the 1998 deadline set by H.R 1020 is a realistic date for DOE to open an interim storage facility?

Ans. Although the DOE could administratively begin *accepting* legal title to spent fuel in 1998, beginning to accept spent fuel at a storage facility by 1998 would present a very difficult challenge under current regulatory and statutory requirements. Under the best of circumstances, significant amounts of spent fuel could not realistically be moved from reactor sites to a storage facility until sometime around 2003 for the following reason.

None of the tasks associated with developing a storage facility pose insurmountable technical difficulties; however, time will be required to demonstrate compliance with existing safety and environmental protection standards. Before a storage facility can be placed in operation, the DOE would need to select a site and characterize its suitability (e.g., seismic hazards, etc.), construct the facility, and have it licensed by the Nuclear Regulatory Commission (NRC). The DOE also would need to develop a truck and rail infrastructure capable of transporting the spent fuel from reactor sites to the storage facility.

It is possible that this process could be expedited, for example, if an existing DOE defense site with an extensive database of site characteristics were selected as the site for a storage facility. The process also might be expedited if the NEPA process were altered, for example, to eliminate consideration of alternative sites. The Board notes that a significant short-circuiting of existing laws and regulations, however, could have negative repercussions among stakeholders.

In the Board's judgment, before changing current policy, serious consideration should be given to the potential consequences that lowering the current priority on disposal would have for the credibility of the country's entire waste management program. The success of the program appears to be quite dependent on sustaining public trust and confidence. Balancing the desire to expedite this process to meet the desires of utilities to remove spent fuel from reactor sites, with the need to assure the public that safety will be maintained, is a delicate process.

Is it realistic to expect DOE to submit a multipurpose canister application to the Nuclear Regulatory Commission (NRC) by April 1996?

Ans. As the Board understands the DOE's multipurpose canister program, the DOE initially will apply for a license for a canister designed for dual-purpose (transportation and storage) use. Later, the DOE proposes to apply for a disposal license as well. The initial licensing of the cask for dual-purpose use could be completed by the April 1996 date. Similarly, the private sector is responding to the utilities' immediate storage and transportation needs through development of (1) a dual-purpose cask and (2) a combination of transportation overpacks for commercially available storage canisters.

Is it realistic to expect DOE to submit an interim storage application to the NRC in six months of enactment?

Ans. Probably not.

2 *Critics of DOE's repository program have suggested that two primary problems which have plagued DOE's waste program over the years are at least partially Congress's fault: inadequate funding and unrealistic deadlines.*

a. Are these fair criticisms?

Ans. In the Board's view, these criticisms have some merit but, prior to fiscal year 1994, it also is true that the DOE consistently requested from the Congress substantially less funding for the program than it estimated it needed. It is ironic that just as the DOE is making real progress in exploring the underground at Yucca Mountain and we are about to reap the benefits of past expenditures, funding for the repository program may be substantially reduced.

The deadlines spelled out in the Nuclear Waste Policy Act have proven unrealistic given the complexity of site characterization and repository development in an arid region and the complex institutional requirements of the program. Consequently, the DOE has been forced to revise its schedule several times, and even the current schedule, which calls for the beginning of repository operation in 2010 is optimistic. However, the DOE feels intense pressure from Congress and others involved with the program to maintain its current schedules. The Board has on several occasions expressed its concern that in attempting to meet unrealistic deadlines the DOE could be forced to make important technical decisions before performing adequate technical and scientific analysis. This could ultimately undermine the technical validity of the program and delay program progress.

b. If so, are you concerned that Congress may make these mistakes again?

Ans. Yes. And, in the Board's view, the problems could be compounded if the DOE is required either to (a) halt repository development or (b) sustain both repository development and a very ambitious storage program, without realistic schedules or adequate funding.

3. I am concerned that if Conress is not careful, it will assign DOE interim storage responsibilities that overwhelm the repository program.

a. Do you share my concern that there is a danger that interim storage is likely to become de facto permanent storage?

Ans. As explained in the answer to question 1, there always will be concern if the focus of national policy does not remain on finding a suitable site for permanent geologic disposal. Directing the DOE to develop a storage facility by 1998 — without a commensurate increase in funding for storage activities — will almost surely delay the repository program. To be meaningful, a storage capacity of 30,000 metric tons or more of spent fuel (this does not include defense waste) needs to be established. If a facility of this size (or several facilities that in the aggregate have a capacity to hold a similar amount of waste) were constructed, the urgency of the utilities to find a permanent repository could be significantly reduced.

As discussed below in the answer to question 4, storage is no substitute for disposal. The Board sees advantages to including centralized storage in an integrated waste management program — particularly to avoid potential and perceived problems associated with storing spent fuel at shutdown reactors. However, the Board believes that efforts to deal with spent fuel storage should not be pursued at the expense of the repository program. Furthermore, the Board believes a viable repository development program is a prerequisite for the success of any storage option — at reactors or off site.

b. What are the implications for defense waste disposal if the permanent repository program were delayed or abandoned? How important is it to keep up the repository program on a relatively fast track in order to deal responsibly with this defense material?

Ans. Defense high-level radioactive waste, including government-owned spent fuel, requires deep geologic disposal just as does civilian spent fuel. Indeed, current U.S. policy calls for the co-disposal of these materials — a policy that makes eminent sense from economic and safety perspectives. Technically, there are no reasons why defense waste and civilian spent fuel should not be disposed of in a common repository.

A delay in the current repository program will result in a commensurate delay in the disposal of defense wastes. Maintaining momentum in the repository program will allay the fears held by many states with defense high-level waste that their states will become de facto disposal sites for that waste.

4. *With respect to funding limitations, if budget pressures forced Congress to choose between interim storage and the repository, which would you advise us to make the higher priority?*

Ans. Storage is no substitute for disposal. The Board believes that it would be very unfortunate if progress being made in the repository program were halted or significantly slowed, either intentionally or unintentionally.

There is an international consensus among scientists and engineers that no fundamental technical obstacles exist to safely disposing of high-level radioactive waste in a deep geologic repository constructed at a suitable site. The DOE's site-characterization program at Yucca Mountain is finally poised to obtain significant amounts of information that would allow a comprehensive evaluation of the site to determine whether it is suitable for a repository.

The question is not whether to store spent fuel. It already is being stored at reactor sites and will continue to be stored somewhere for decades. The question is *where* the spent fuel should be stored. The Board sees advantages to including centralized storage in an integrated waste management program — particularly to avoid potential and perceived problems associated with storing spent fuel at shut-down reactors. However, the Board believes that efforts to deal with spent fuel storage should not be pursued at the expense of the repository program. Furthermore, the Board believes a viable disposal program is a prerequisite for the success of any storage option — at reactors or off site.

5. *Many critics argue that it is impossible for anyone to speculate intelligently about building a repository that can safely isolate radioactivity for 10,000 years.*

a. In your opinion, is a 10,000 year standard a reasonable basis on which to ask the NRC to license the repository?

Ans. Selection of a repository site requires evaluation of its performance for time frames much longer than required for other activities. The long half-lives of potentially harmful radionuclides require that the public and the environment be protected from exposure to this material for thousands of years. The fundamental premise behind geologic disposal is that many geologic formations have been relatively stable for millions of years and are very likely to remain stable for millions of years in the future. The advantage of geologic disposal is that deep geologic formations are virtually immune to many of the pestilences (fire, flood, tornado, hurricane) that affect the earth's surface.

The geologic record provides much evidence on the behavior of buried rock over many millions of years. However, expert judgment may be needed for guiding decisions on extending the applicability of some limited observations of natural processes and laboratory and in-situ experiments to the time periods needed to assess repository safety. Such judgment must rely on firm technical analyses of scientific data obtained from an examination of the repository's hydrogeologic environment and from appropriate underground tests and experiments. With such a firm technical base, it is not an unreasonable or impossible task to predict repository performance for several thousand years — given adequate time and money to complete the necessary site characterization and testing. The Board also supports keeping the repository open for an extended period to provide an opportunity for continued evaluation of its operation.

On the other hand, predictions of the potential for human interference with, or intrusion into, a repository, over thousands of years are highly speculative. The National Academy of Sciences (NAS) currently is formulating its recommendations on how to consider human intrusion when setting safety standards for a repository. The NAS's report should help to resolve questions about the best approach for the treatment of the potential for human interference with, or intrusion into, a repository.

b. Should Congress consider changing the current method of establishing a safety standard for the repository? What is your opinion of proposals, such as that included in H.R 1020, under which Congress would set a specific standard? Do you see any dangers in this approach? Do you have any alternate suggestions?

Ans. The Energy Policy Act of 1992 specifies the current method of establishing a safety standard, by directing the NAS to evaluate the technical bases for a Yucca Mountain standard. The Act also directs the Environmental Protection Agency (EPA) and the NRC to modify their regulations in accordance with the NAS recommendations. In the Board's judgment, the Congress might consider allowing this process to run its course, at least to the point of permitting the NAS to complete its evaluation of the technical bases for a Yucca Mountain standard.

6. H.R. 1020 permits DOE to begin constructing an interim storage facility before receiving final approval of its license application by the NRC. Do you see any drawbacks to providing DOE with this flexibility?

Ans. The procedure proposed in H.R. 1020 represents a departure from the currently prevailing policy, which provides for a thorough airing, adjudication, and resolution of all technical questions before construction of a nuclear facility of any kind begins. In the Board's judgment, before changing this policy, serious consideration should be made of the potential consequences that such a change would have for the credibility of the countiy's entire waste management program — whose success is dependent on sustaining public trust and confidence.

All technical analyses undertaken to date suggest that the health, safety, and environmental risks associated with the construction and operation of a facility to store spent fuel in dry casks are quite low provided sufficient care has been taken in the siting, design, and construction of the facility. However, once construction begins and substantial funds are committed to a storage facility, it may be very difficult, if not impossible, to halt construction, even if serious health, safety or environmental questions should arise concerning the facility.