Statement of

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before a hearing of the

Subcommittee on Energy
Committee On Science, Space,
and Technology
U.S. House of Representatives

Newport News, Virginia
November 8, 1993

Madame Chairman, and members of the subcommittee. I am Sherwood Chu, a member of the senior professional staff of the Nuclear Waste Technical Review Board. With me today is my colleague, Dr. Carl Di Bella. We provide the technical staff support to the Board in the areas of transportation, storage, and the engineered barrier system. On behalf of the Board, I would like to thank you for inviting us to participate in today's hearing. Dr. John Cantlon, the Board's chairman, could not be here today, so he has asked us to represent the Board this morning.

Very briefly, our Board was created by Congress in the Nuclear Waste Policy Amendments Act of 1987. Congress directed us to evaluate the scientific and technical activities associated with the DOE's program to manage commercial spent fuel and defense high-level waste. Our Board is *not* part of the Department of Energy.

The subcommittee has asked the Board to comment on the potential of the multipurpose container concept and related research and development needs. While addressing the potential of the multipurpose container concept, I will outline for you some of the Board's concerns. Several of these concerns were discussed at length at a recent Board meeting held last week on the broader subject of the interim storage of spent nuclear fuel. Finally, I will make a few statements about the research and development needed before final decisions about a multipurpose container can be made.

*The potential of the MPC concept*

Let me first emphasize that the multipurpose container—the MPC—is presently only a concept As a *concept,* the Board believes it offers potential. It has the potential of addressing a number of broad issues that the Board has identified in the past, including, enhancing safety; developing a systems approach to manage the storage, transport, and disposal of spent fuel; and standardizing the features in the waste management system.

The Board has for some time been urging the DOE to assess alternatives to its current "baseline" design concept for managing the disposal of the nation's spent fuel and high-level waste. From early on, the Board has been concerned about the many handlings and transfers of spent fuel required in this "baseline" scenario, which calls for the use of different single-purpose casks for storage, transportation, and disposal. To reduce handling

and enhance safety throughout the system, the Board recommended that the DOE look at alternative technologies, including the development of a universal, or multipurpose container concept that could be used for storage, transport, *and* disposal.

The MPC concept also could substantially reduce the potential problems arising from the proliferation of nonstandard technologies. For example, as some utilities begin to run out of storage space in their spent fuel pools, they are facing the need for the dry storage of spent nuclear fuel at their reactor sites. As the need for dry storage has increased, a number of different storage systems have been installed by the utilities. A diversity of technologies may pose problems of compatibility for the civilian radioactive waste management system.

An additional advantage of the MPC concept is that it, by its very nature, may force a systems approach to the waste management process. If the MPC concept is developed properly, the DOE will have looked at the storage, transport, and disposal functions in an integrated manner. However, the Board has concerns about how the MPC concept may be developed.

*Board concerns*

As mentioned already, the Board has consistently stated that the functions of storage, transportation, and disposal are strongly interconnected. Because of this, the Board has urged the DOE to use systems analysis when making decisions about different parts of the waste management process. This kind of work is a prerequisite for design, and, although some future iteration may be necessary, systems analysis should not entail a large-scale effort Doing a systems analysis will allow the DOE to evaluate the pros and cons of alternative concepts for major pieces of the system.

A systems analysis also will provide a technical basis for making decisions related to various MPC performance criteria and design features. Such an analysis should take into account aspects of the rest of the waste management system, including, for example, the MPC's effects on the design of the repository and thermal-loading options. A systems analysis should also be performed to determine if the various potentials of the MPC concept — such as safety enhancement and cost savings — can indeed be achieved. As was noted at our meeting last week, a complete systems analysis is not currently available, and the DOE itself acknowledged that much remains to be done in this area.

In its March 1993 *Special Report to the U.S, Congress and the U.S. Secretary of Energy* t the Board observed that the overall civilian radioactive waste management program is being driven by unrealistic deadlines. This appears to be the case with the MPC as well. The DOE seems to be rushing to settle on a design so the MPC will be ready to meet the 1998 date for federal acceptance of spent nuclear fuel from the utilities. But, if systems analyses have not been completed, the premature specification of a design could preclude more desirable options later on — or even result in program delays and additional costs.

Another of the Board's concerns is that to meet the 1998 date, the disposal function may be given low priority during MPC development. This could result in a dual-purpose container that can be used only for transport and storage. The Board believes that if the disposal function is lost, the appeal of the MPC concept will be substantially diminished. Therefore, when assessing any multipurpose container concept, the DOE should evaluate its potential for transport, storage, *and* disposal of the spent fuel — *not* just storage and transport.

*MPC research and development*

I would like to make some brief comments about MPC research and development. In the absence of sufficient analysis to support the definition of the MPCs desired design features, it is too early to talk about an MPC research and development program except in a very general sense. However, it is important to note that the Board has long advocated sufficient and consistent funding for efforts to develop a robust, long-lived disposal waste package, which, after buriel, should work together with the geology of the site to form a multibarrier, defense-in-depth approach to waste isolation. To be able to project the performance of waste package materials with reasonable confidence for several thousand years, careful, long-term research will be required. Unfortunately, the level of research and development related to selecting materials for the disposal waste package has been very low; much work in this area has not yet been planned. Research work also is needed to evaluate the potential problems involved with welding thick packages filled with spent fuel and, most particularly, on developing methods for examining the welds of such packages. The Board has repeatedly urged the DOE to increase its emphasis on research and development in the area of waste package design.

In closing, I would like to reiterate that the Board believes that the MPC has potential as a concept However, the Board has a number of concerns about how the

development of the MPC concept progresses. Technical decisions concerning the MPC design should not be driven by a desire to meet a deadline; the choice of the ultimate MPC design should be supported by a thorough systems analysis; and the disposal function should not be sacrificed during design efforts.

Thank you. We would be happy to respond to questions.