UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Title: BRIEFING BY DOE ON STATUS OF MULTI-PURPOSE CANISTERS (MPC) - PUBLIC MEETING

Location: Rockville, Maryland

Date: Friday, June 9, 1995

Pages: 1 - 24

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1250 I St., N.W.,Suite 300
Washington, D.C. 20005
(202) 842-0034

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BRIEFING BY DOE ON STATUS OF

MULTI-PURPOSE CANISTERS (MPC) - PUBLIC MEETING

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Nuclear Regulatory Commission

One White Flint North

Rockville, Maryland

Friday, June 9, 1995

The Commission met in open session, pursuant to notice, at 10:15 a.m., Ivan Selin, Chairman, presiding.

COMMISSIONERS PRESENT:

IVAN SELIN, Chairman of the Commission

KENNETH C. ROGERS, Commissioner

E. GAIL de PLANQUE, Commissioner

SHIRLEY A. JACKSON, Commissioner

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STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

JOHN C. HOYLE, Secretary

MARTIN MALSCH, Deputy General Counsel

DR. DANIEL DREYFUS, Director, Office of Civilian Radioactive Waste Management, U.S. Department of Energy

MR. LAKE H. BARRETT, Deputy Director, Office of Civilian Radioactive Waste Management, U.S. Department of Energy

P R O C E E D I N G S

CHAIRMAN SELIN: Dr. Dreyfus, Mr. Barrett, in reflection upon the meeting that we've already had, I think a fair summary is that you're making progress, the relationship is healthy and improving between our two agencies. You still have lot of thinking and planning to do and even more communication will be called for. You recognize this and you plan to continue this. If that's a fair summary, I personally am quite pleased with that part of the proposal.

My colleagues and successors will be looking forward to additional detail as these become available. One of the topics that is a relatively new topic in which we would like to get your overall views, directions, et cetera, is, in fact, the multipurpose canister system. So I think we should go on to this as a very specific topic, obviously more detailed than in the overview you gave us earlier this morning.

DR. DREYFUS: Yes, sir. Thank you.

Well, this piece of the program we are also in very active interaction with the Staff and we appreciate the recent actions that the Commission has taken to support us in the initiative. We applaud the establishment of Spent Fuel Program Office, which will help us with timely certification of the canisters, the storage and

transportation and we believe that the Burnup Credit Task Force, which brings together the appropriate expertise to deal with that issue, which is a central issue to both this and the repository will help.

Presently there are seven nuclear power plants that already store about 600 metric tons of spent fuel and dry storage. Those plants have selected technologies based upon a lot of site specific issues and with a heavy emphasis on near term economics.

At the seven plants, there are nine different types of technologies in use and none of the current technologies or ones actually in use are transportable. Therefore, additional spent fuel handling is going to be necessary to ship the fuel off site. On the current situation we, of course, are not working on a Federal facility to centralize storage until the repository is available and we would estimate that by the year 2010 they'll be about 55 sites with dry storage of about 11,000 tons.

Now the multipurpose canister system is a response to that evolving situation. In the earlier days, nobody expected to have quantities like that of dry storage in the scenario for the out years. It's not a new concept. Nuclear industry recognized that an interchangeable seal canister would have benefits. The Commission Staff

commented about capability about at-reactor storage technologies and the coming Federal transportation system in 1998.

The Department performed its initial feasibility study in '92 to evaluate the advantages of using the sealed canisters and the benefits were basically that it reduced the number of fuel handlings or transfer, thereby reducing worker exposure and overall risk, reduced generation of low level due to the reduced contamination system components, simplified facilities that would be necessary throughout the system because of reduced handling of individual assemblies and it introduced capability between the at-reactor storage and the Federal waste management system.

I would also add to the extent that a new generation of technology widely accepted and endorsed, it would help to standardize what is otherwise likely to become an example of non-standardization leading to the usual problems you have with nonstandard, training problems and difficulties throughout the system.

Now you expressed an interest in economics and we can pursue that to the extent that you wish. The Department recognized that the multipurpose canister cost more than a conventional single purpose cast and canister system than is necessary. Necessarily will. It addresses many issues that the single purpose canisters do not.

Cost estimates in the early study lead to our decision where $276,000 for a small canister to $432,000 for a large canister. It overpacks -- storage overpacks $140,000 to $180,000 and the transportational overpacks, which of course, are reusable and will require only a fleet are $1.5 million to $2 million each. Total estimated cost for 11,000 canisters was about $5 billion.

The study showed that based on the assumptions that were made -- and God knows there are many assumptions that can be made about the scenario in which these canisters would be used. But based upon what seemed to be a rationale future at that time, the cost savings would be about $550 million for a system based on multipurpose canisters as compared to a system based on the handling of individual bare fuel assemblies.

In the dimensions of that estimates, that is a very modest difference and not one would rest a lot of management decision upon. So the incentive to go into the multipurpose design and certification is largely one of improving a systematic operational condition and putting an improved technology into the marketplace, not one of saving money.

On the other hand, of course, it most be economically defensible, so one needs to be sure it doesn't add measurably or significantly to the total burden of the

system.

Our recent procurement gave us some more information on probable costs. We are still in a contested procurement and, therefore, can't speak to specific, of course, but it will tell you that what we now know believes us to believe that the initial cost estimates, if anything, are on the safe side. We don't think it will be more expensive.

CHAIRMAN SELIN: Let me just make clear the cost of the management is completely DOE's responsibility. The Commission's interest in the cost are oblique and even my personal interest are oblique.

But we are very interested in the repository going forward and we all realize that in the economic climate, which is likely to continue, there are serious concerns as to whether all parts of the program can be funded, and that's our only interest in the cost, that it not be seen as diverting so much in the way of resources that the repository itself could not continue at a technically defensible pace. So that's it. No more.

DR. DREYFUS: Well, that's perfectly relevant to these costs because basically the question is, are we going to carry out the functions of the Federal system at a much larger increment than what would happen if we did not bring the technology forward? And I think the answer is we think

not. We don't necessarily justify bringing technology forward on the basis of cost savings, but rather on a basis of system simplification.

We have a figure, which I'll call for, that illustrates the concept. Simplistically the canister contains a basket structure that hold spent nuclear fuel in fixed arrays. System currently conceived includes both a large 125 ton and a small 75 ton canister to address the limitations at some reactor sites.

The spent fuel would be placed in the internal canister and welded closed. The intent is that that canister, once sealed, would not be reopened. A canister is stored, transported, and ultimately disposed of in specially designed overpacks for each purpose.

We expect the storage overpack to resemble currently available concrete systems. Transportation overpack will be a reusable metal cask. The disposable overpack, of course, will be the waste package, but is in the early stages of conceptual development. It will include multiple barriers to provide both resistance to corrosion through specialized metals and allowance for corrosion through sheer thickness.

CHAIRMAN SELIN: Dr. Dreyfus, in the '94 report there was an indication that the at-facility routine radiological exposures would be about 25 percent higher

because of the need to weld the lid. I can't understand why that would be the case. I mean there are so many remote welding technologies. It's not obvious. I wonder if you still believe that.

MR. BARRETT: We have information on that and it would be fine, the conservative estimates that we did have, and I have to call on Mr. Jeff Williams, whose our Director of Engineering in this area, to address that.

MR. WILLIAMS: Thanks.

CHAIRMAN SELIN: Good morning, Mr. Williams.

MR. WILLIAMS: Basically what that was, was an accumulation of a way to operate the system. When you have -- when you need at-reactor storage and you're going to use a multipurpose canister, the dose is actually less. The reason why it showed that there was an increase was the way the study was done was we used multipurpose canisters -- that same multipurpose canister for all the spent fuel and there was approximately 80 to 85 percent of the fuel in the way that the scenario was set up that did not need dry storage.

For that percentage of the fuel there was a higher dose as compared to loading say an IF 300 cask, a normal transportation cask. Now that doesn't mean we would operate the system that way --

CHAIRMAN SELIN: I don't care about any of that.

I just care whether you still believe there's going to be a higher dosage.

MR. WILLIAMS: No.

[Laughter.]

CHAIRMAN SELIN: Thank you.

DR. DREYFUS: Okay. We've undertaken the development of the system in phases to allow for reevaluation and changes as the technical and institutional requirements a waste management system are defined. Initially, the system will be designed and licensed to meet the NRC's storage and transportation requirements while considering the known disposable requirements.

We recognize the possibility that modifications to the initial canister design may be required to demonstrate the ultimate disposal requirements as they are known or, indeed, to accommodate other aspects of the waste package design as it is known.

We've at this point initiated the NEPA process. Final Environmental Impact Statement will be completed next year. We awarded a contract for the design of the canister to Westinghouse Government and Environmental Services Company on April 20.

I have a figure that illustrates the schedule for the major activities associated with certification. According to the information provided by your Staff, a

combined storage and transportation certification review is expected to take approximately 20 months. The schedule also includes 12 months for rulemaking to add the system to the list of approved casks.

CHAIRMAN SELIN: Actually, if there were changes in legislation, it wouldn't even necessarily take 12 months for the rulemaking. On the other hand, there would be the possibility of a challenge, not an adjudication, but a challenge. The Commission has in the past when the legislation or the statute is clear, we have conformed the rule to the statute and made it immediately effective and then allowed comment, but not required the comment before immediate effectiveness, if the statute is clear, if we honestly are just carrying out the law as opposed to making further decisions ourselves.

DR. DREYFUS: Yes, sir. We, of course, are continuing to work with the Staff to ensure public involvement in the certification process and to arrive at the details of the schedule.

To minimize the possibility that this canister will be incompatible with disposal, we're developing a technical report, which we intend to submit along with the storage and transportation applications in April of '96. We expect that the staff will review the report and determine based on the current knowledge of the repository if there

are aspects of the canister that would preclude its use as part of the waste package.

Now the variety of legislative and budgetary initiatives already --

CHAIRMAN SELIN: I'm sorry, Doctor. Before you get off that. This question may be premature, but if you can, answer it. Are you proposing to ask -- to basically ask for the certification of the disposal before you have the design and therefore set an envelope into which the design has to fall or are you waiting to have an overall waste form and the repository design before you ask us to certify the disposal --

DR. DREYFUS: We are not expecting to certify the canister for disposal before we have the design for the waste package before you. What the expectation here is to build a canister that has the possibility of being disposed and to not knowingly introduce any factor that would preclude its disposal

CHAIRMAN SELIN: I see.

DR. DREYFUS: So we will design it. We have -- part of the standards are set by our current notion of the repository package design. We've imposed disposal standards upon the design.

CHAIRMAN SELIN: Sure.

DR. DREYFUS: And if we've guessed right, we hope

we would use it.

CHAIRMAN SELIN: But from our point of view --

DR. DREYFUS: From your point of view again --

CHAIRMAN SELIN: Dual purpose certification and a bunch of topic papers on disposal?

DR. DREYFUS: And an opinion from the Staff on disposal.

CHAIRMAN SELIN: Not crazy from a disposal -- I'm sorry. No known implements to -- no known impediments to disposal.

DR. DREYFUS: Exactly.

CHAIRMAN SELIN: I'm not up to four syllable words any more.

MR. MALSCH: If you're going to do it that way, then will your waste package have implicit in it your design thermal load?

DR. DREYFUS: Well, by the time we get to the stage of the design of the waste package, yes. Now there already criteria with regard to the integrity of clouting and the skin temperature of the waste package that we have got to introduce at this stage in order to have a set of criteria for the design of the work from.

So we have dealt with some of these limits, the bounding conditions with regard to this. What we don't know, of course, is precisely what the waste package design

will be and the canister has to be compatible with that.

There is no -- the point that I would like to make -- I might as well make it now. It's in the statement probably later on -- is that relatively small incremental commitments are being made here. I mean we have a design contract now. It progresses into a certification and prototype contract.

Even if we were to procure and use an order of these canisters and then find that we have to redesign and repackage that first order, it's nothing different from the scenario we're otherwise in, in which case we will receive at the repository somebody's else canister that has to be repackaged. So the thing is robust to the change in the circumstance as we go forward.

By the time we have bought any of these canisters, we will have an advanced design of the waste package in hand. We will probably have the Commission's certification because of time sequence, but we'll be pretty close to a final design. So nothing is lost in this exercise really if we were to have to modify the canister to pick up the last nuances of the waste package design even after we bought some for several years.

That I think is the missing ingredient. There has been questions I get. It's why are you going to try to do this before you know what you're doing? And my answer is

why would I just do something that I know I can't use without thinking about it? I ought to be able to come pretty close and with luck I can have a container that doesn't have to be opened or I can have a near proximity that the second iteration of doesn't have to opened. This seems to me a prudent thing to do.

We know now that we are confronted with an uncertainty about what the interim management of spent fuel is going to be. We know some things. We know that there will be a lot of dry storage. It will either be at-reactors or in a centralized situation, but there will be more dry storage and people contemplated early in the industry.

We believe that the multipurpose canister technology offers advantages in most of the possible scenarios and is economically desirable in most of them. In some specialized scenarios, it probably is overpriced. But we have staged a program to permit those evaluations to take place with a new decision to be made as we progress and gain information.

The early commitments are modest compared to the potential benefits in most of the scenarios that we can see. I can develop that further if you wish. We think there's a strong policy imperative to develop dry storage technologies that are compatible with a total system concept. We know we will have a lot of dry storage and we believe that the

existing technologies will not suffice.

I am prepared to go further to any aspects of this that you wish.

CHAIRMAN SELIN: Commissioner Rogers?

COMMISSIONER ROGERS: No, I don't really have anything special at this point.

CHAIRMAN SELIN: Commissioner de Planque? No.

I'd just like to stress how central the MPC is to the overall concept and, therefore, to the feasibility. The Commission is trying to keep track with the commendable broadening of view of the program, that it is a high level waste program, not just a deep geological burial program and, therefore, since the canister, as we understand it, is central to your concept of a multipurpose, but also a transportation as well.

The Staff has expressed and the Commission supports them a great interest in keeping up with these pieces. As Commissioner Jackson question suggests, the interaction between waste form design and the canister review is quite intimate. So we need to keep up with that.

We are concerned not with what you said, but what hasn't been said yet, which is specific schedules, when there might be designs to be reviewed and when there might be applications. I wonder if you might talk a little bit about the program side of things, as opposed to the systems

concept, which you have addressed this morning.

DR. DREYFUS: Yes, I can. Have you got the dates?

MR. BARRETT: Yes. I can mention a few things. Yesterday we had a prelicensing meeting with Westinghouse and DOE and TOW, who is our prime contractor, with the Staff to start the iteration process formally on the Westinghouse MPC.

The SAR submittal date is April of next year. It's a one year time period from the time of the contract, you know to go forward. At that same time, April next year, we would provide our geologic repository considerations as it relates to the canister also April next year, leading to a review process that was laid out in the chart that Dr. Dreyfus had. So that is the submittal schedule for that in the near term.

This would lead to a summer of '97 time period where we would receive basically the Staff SAR, which would be the Staff's views of the adequacy of the system for storage under 72 and transportation under CFR Part 71, not the final decision, and also the Staff's views on the compatibility of the canister with the geologic program.

Then that would be the point where we would have completed our NEPA documentation and we'd be in a position to make decision regarding -- about going forward in the economic investment to exercise the third phase, which would

be the procurement of the first basically two year, two and a half year, two of the three years, depending on what receipt rate of canisters. It would be the first buy of canisters.

Then we'd go through the process. We would then construct those such that they would be available during 1998. If schedule holds on your hearings, it would be the end of '98. They could be utilized for fuel storage at utilities and transportation, if we have a place to go at that time.

CHAIRMAN SELIN: Could you talk a little bit about who's going to own what and who bears the financial burden at different points? You know the interaction between taking title, having the fuel, who will own the canister, who will put up the cash and how it will be reimbursed, because these affect schedule? I would expect they would affect schedule.

DR. DREYFUS: That, of course, is a live issue on the Hill right now and there are a variety of things in the pending draft legislation that might change it. The presumption was, I think, in the original bid under current law and policy was that we, the Department, were responsible for the transportation and if there needed to be a transportation fleet, which there would need to be, it would have to be developed at the expense of the waste fund and

probably by us.

The at-reactor storage situation, of course, is an evolving one, and nobody anticipated in '82 that there would be that much of it. That is a subject of several actions right now, some of them litigation, some of them congressional, as to whether we would, in fact, supply canisters. We have talked about supplying canisters for at-reactor storage, which would be necessary in any event to remove the fuel.

My own working --

CHAIRMAN SELIN: Canisters would be necessary, but the --

DR. DREYFUS: Well, you have to move them one or another and --

CHAIRMAN SELIN: No, the Department supplying them is not necessary. I mean they could be provided in any of several ways.

DR. DREYFUS: Well, in any event, the contractual arrangement as to how you do this, whether you procure or deal through the utilities -- there's a lot of ways you can get at this if the technology is available in the marketplace, whether we own the transportation fleets or arrange transportation and that sort of things. A lot of different ways to do it. I haven't gotten into that.

My own working hypothesis is that the current law

expects the cost of waste acceptance transportation, storage at a Federal facility and disposal be paid out of the waste fund and that it did not expect that reactor storage to be paid out of the waste fund.

So I think to the extent that the cost of equipment at the reactor is a cost that ultimately has to be borne anyway, you probably can do it. Otherwise, you need new congressional direction. In any event, the Appropriation Committee will tell me if I'm wrong when the time comes.

CHAIRMAN SELIN: One of the reasons I raise that is the Commission is quite interested in seeing that shut down reactors move to dry storage as soon as feasible. Although it's not a major issue compared with the other ones you're grappling with, we would hope you wouldn't construct a program in such a way that it took away the incentive that currently closed down reactors to go to dry storage themselves.

You know it would not be desirable if they saw it in their benefit to sit and operate the pools for another ten years from the point of view of who would bear the bill for the dry storage and --

DR. DREYFUS: I'm very aware of both the inter-utility equities of how we manage this new burden on the fund and also this --

CHAIRMAN SELIN: We're not talking about equity. We're talking about --

DR. DREYFUS: I think the policy.

CHAIRMAN SELIN: I mean you talk about equity. It's very important. But from our provincial -- parochial -- not provincial -- parochial point of view, it's the safety that's the --

DR. DREYFUS: I think there's a strong public interest desire to deal with the more significant issues first and that we will try to do. We, I think, are going to get instruction about that over the next year or so and I hope that the policy guidance we get will address some of these problems.

They clearly are not -- I mean the circumstance we're in is not one that was contemplated in '98 and that's one of the things that needs to be dealt with here in terms both, not only of interim storage, but this whole question of managing the at-reactor storage that's inevitable at this point.

CHAIRMAN SELIN: Changing the subject, we know there's some inconsistencies between Parts 71 and 72. Our judgment is that they're not so serious that they have to be fixed, that they're not currently in the way of your going ahead with the MPC. Do you share that observation?

DR. DREYFUS: That's my understanding.

MR. BARRETT: We have not been reported to us that's there's anything significant. So we agree.

There may have been discussion on the previous discussion a little bit. One of the considerations we had in the development of the multipurpose canister was that this contract would be free of encumbrances as far as proprietary information so that regardless of what happens regarding the Federal involvement of the canister, utilities would be -- could go forward and make their own decisions and go forward with it without any owings developed with basically the rate payers funds and the taxpayers funds. So that was a consideration we had.

CHAIRMAN SELIN: Commissioners?

[No audible response.]

CHAIRMAN SELIN: I guess you've gotten through your presentation in record time. I suspect that the next one won't be so fast, that you'll have more detail to present to the Commission, but you might as well pocket the savings while you can.

This progress, this communication, it seemed to be good sentiments, et cetera. I'm sure you're aware that the Commission, the Staff is trying to structure the High Level Waste Program to maintain the public interest and health and safety, but not to put either regulatory or procedural impediments in your way as you go forward, and that's all to

the good.

On the other hand, we can't process license applications until we have license applications, not pseudo applications, et cetera. So in spite of these statements, which are sincere, of flexibility and appropriateness, it would be foolish for us to make unreasonable promises as to time. This has more to do with the repository than with the MPC itself, although the two schedules are clearly tied together because, as you said, you wouldn't ask for final certification for disposal until you were fairly well along in the disposal concept.

So you said it a number of times. I think it's a true statement. This is not like a reactor. It's a, if not one of a kind, the first of a small number of repositories and others that would come up for either licensing or certification as appropriate and from top to bottom the Commission and the Staff wishes you well and is prepared to make the issues safety and environmental issues and not procedural issues.

We'll all be looking at legislation because your plans could change quite spectacularly one way or another, depending on what happens both in the authorization and in the appropriations. It's clear from steps that the NRC Staff have taken that this is receiving very high priority. It's receiving attention at all levels to make sure that we

can separate out the legitimate and inviolable principles of safety and public interest from the bureaucratic or procedural ones that have been tied to legislation, which we all realize doesn't quite fit the current situation.

Any more?

Thank you very much for your presentation.

DR. DREYFUS: Thank you.

[Whereupon, at 10:50 a.m., the meeting was concluded.]

CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING BY DOE ON STATUS OF MULTI-PURPOSE CANISTERS (MPC) - PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Friday, June 9, 1995

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Tracy McQueen

Reporter: Mark Mahoney

STATEMENT FOR THE RECORD
PRESENTATION TO THE U. S. NUCLEAR REGULATORY COMMISSION
STATUS OF MULTI-PURPOSE CANISTER SYSTEM
ACTIVITIES ASSOCIATED WITH THE
CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM
BY
DANIEL A. DREYFUS, DIRECTOR
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
JUNE 9, 1995

Introduction

Chairman Selin and Members of the Commission:

Thank you for the opportunity to brief you on the progress we have made in developing the Multi-Purpose Canister System. My statement today will provide background on the multi-purpose canister concept, present estimated costs of a multi-purpose canister-based system, and discuss our view of the Multi-Purpose Canister System, including the current status of its development and our near-term plans for technology certification.

Last December, I informed you of the status of our efforts in this area and our plans for 1995. At that time, I indicated our near-term focus would be on the design of the Multi-Purpose Canister System and on the National Environmental Policy Act (NEPA) documentation to support the decision making process. I also discussed the Department's plans for submitting a Topical Report on burnup credit. The Department is making good progress in these areas. We continue to interact frequently with your staff and have incorporated their guidance into many of our activities.

I appreciate recent actions the Commission has taken to support this initiative. We believe the establishment of the Spent Fuel Program Office will help achieve timely certification of Multi-Purpose Canisters for storage and transportation. We also believe that the formation of the Burnup Credit Task Force, which integrates expertise from the various NRC branches, will help resolve issues associated with burnup credit. We expect that these actions will contribute greatly to the progress we need to make in the months and years ahead.

Dry Storage Situation in the United States

Presently, there are seven nuclear power plants that store approximately 600 metric tons of spent fuel in dry storage. These plants have selected storage technologies based upon a number of plant-specific factors with near-term economics as a key consideration. At the

seven plants, nine different types of technologies are in use and only two of the seven plants have chosen the same technology. We expect additional types of storage technologies will be developed to meet the specific needs of each power plant site. None of the current storage technologies are transportable. Therefore, additional spent fuel handling will be necessary prior to shipment off-site.

Until a Federal facility is available to accept spent fuel, additional at-reactor dry storage will continue to be required. We estimate by the year 2000, 24 facilities will require dry storage for 2,300 metric tons of spent fuel. By the year 2010 this estimate will increase to 55 sites needing dry storage for 11,000 tons of spent fuel. If no storage or disposal facility is available by the year 2020, we estimate 60 sites will need to store 21,000 tons on-site in dry storage.

Storage technologies that can be transported have been designed and are in various stages of review by the NRC. None of these technologies have been certified for transport and storage, and only one utility that we are aware of has made a commitment to use this dual purpose technology. These transportable storage technologies have not been designed with consideration of disposal needs and are not designed to accommodate the wide range of fuel that will require eventual disposal.

Background on the Multi-Purpose Canister Concept

The multi-purpose canister concept is not new. The nuclear industry has recognized for some time that interchangeable, sealed canisters could offer a number of potential benefits over existing cask and canister technologies. Your staff's response to the Department's 1988 Dry-Storage Study expressed concern with the compatibility between at-reactor storage technologies and the Federal transportation system. Further, studies by the Edison Electric Institute and the Electric Power Research Institute in 1992 showed a number of potential advantages for multi-purpose technologies.

The Department performed its initial feasibility study in 1992 to evaluate the advantages of using sealed canisters to handle spent nuclear fuel throughout the Federal waste management system. The benefits of using a sealed canister system were found to include: (1) reduced numbers of fuel handlings or transfers thereby reducing worker exposure and overall system risk; (2) reduced generation of low-level waste due to reduced contamination of system components; (3) simplification of facilities due to the reduced need to handle individual spent fuel assemblies; and (4) compatibility between at-reactor storage and the Federal waste management system. The Department also recognized the flexibility offered by a canister-based system to respond to a variety of possible scenarios for the storage and disposal of spent fuel.

Multi-Purpose Canister Costs

The Department's 1994 study (Multi-Purpose Canister System Evaluation, DOE/RW-0445) noted that Multi-Purpose Canisters and their respective overpacks cost more than conventional, single purpose cask and canister technologies. Cost estimates ranged from $276,000 for a small canister to $432,000 for a large canister. The storage overpacks ranged from $140,000 to $180,000 each and the transportation overpacks ranged from $1.5 million to $2.0 million each. The total estimated cost for over 11,000 canisters was approximately $5 billion. Since Multi-Purpose Canisters replace the internal basket of the waste package, the transportation cask, and storage casks, cost estimates for the repository, at-reactor storage and centralized storage have decreased. The at-reactor cost savings include the reduction in spent fuel pool operating costs. In summary, the study showed the total estimated costs for a waste management system based on Multi-Purpose Canisters would be about $550 million less than the cost of a system based on handling individual fuel assemblies. The savings, however, are less than two percent of the total system costs and fall within the error range of the estimates. Therefore, costs savings were not a prime consideration in our decision to move to the design phase. We will nevertheless continue to evaluate costs as the design process continues. We are continuing to evaluate operating concepts that will further optimize the system and canister designs. There are several ways to operate the system to take better advantage of the savings that inherently result from using the Multi-Purpose Canister.

The recent procurement afforded the opportunity to refine our original cost estimates. We are engaged in a contested procurement and I can not discuss the specifics of the proposals. We believe, however, that the initial cost estimates for Multi-Purpose Canisters remain valid and may be improved upon. We will nevertheless continue to evaluate costs as the design process proceeds.

The Department of Energy's Proposed Multi-Purpose Canister System

During 1993, the Department developed a conceptual design which included cost estimates to evaluate integration of a Multi-Purpose Canister System into the waste management program.

Figure 1 illustrates the concept. The Multi-Purpose Canister contains a basket structure which holds spent nuclear fuel in a fixed array. Different designs would be used for Pressurized Water Reactor (PWR) fuel and Boiling Water Reactor (BWR) fuel. The system, as currently conceived, includes both a large (125-ton) and a small (75-ton) canister. Once loaded with spent fuel, the canister would be welded closed with a double lid. The intent is that the canister, once sealed, would not need to be reopened.

Canisters would be stored, transported, and disposed of in specially designed overpacks for each of these purposes. The canister, in conjunction with its overpacks, would be designed to meet NRC requirements. We expect the storage overpack will resemble currently available concrete systems. The transportation overpack will be a specially

designed, reusable metal cask. Only a limited number of transportation overpacks will be required. The disposal overpack is still in the early stages of conceptual development and includes multiple barriers to provide both resistance to, and allowance for, long-term corrosion.

We have undertaken the development of the Multi-Purpose Canister System in phases to allow for re-evaluations and changes as the technical and institutional requirements of the waste management system are further defined. Initially, the Multi-Purpose Canister System will be designed and licensed to meet the NRC's storage and transportation requirements, while considering the known disposal requirements. The initial applications we submit to the NRC for certification will include non-proprietary designs of both large and small canister systems for both BWR and PWR fuel. Eventually, we expect that the Multi-Purpose Canister will be licensed as part of the waste package and repository. We recognize the possibility that modifications to the initial canister designs may be required to demonstrate compliance with disposal requirements, but we hope to anticipate the final waste package requirements in the design.

Status of Multi-Purpose Canister Development

In 1994, the Department decided to proceed with the design of the Multi-Purpose Canister System. To evaluate the environmental impacts of fabricating and deploying the Multi-Purpose Canister System we initiated the planning for an Environmental Impact Statement in accordance with NEPA. To continue development, we issued a request for proposal for the design and certification.

- **Multi-Purpose Canister Environmental Impact Statement**

The Department initiated the NEPA process for the development and deployment of the Multi-Purpose Canister System by publishing a Notice of Intent to prepare an Environmental Impact Statement on October 24, 1994. Scoping hearings were held in Las Vegas, Nevada, Chicago, Illinois, and Washington D.C. As a result of scoping comments received from the Department of the Navy, we have expanded our Environmental Impact Statement to include consideration of naval reactor fuel. We expect to publish our Implementation Plan shortly, and a Final Environmental Impact Statement next year. We further expect to issue a Record of Decision in late 1996 that will support our decision on whether to fabricate and deploy Multi-Purpose Canisters.

- **Multi-Purpose Canister System Procurement Contract**

The Program awarded a contract to Westinghouse Government and Environmental Services Company on April 20, 1995. The Westinghouse contract includes three phases: design of the System and options for certification and fabrication. The Westinghouse award was for a fixed price of $14 million for the design phase. The designs for the storage

and transportation casks are expected to be completed and the applications ready for submittal to the NRC by April 1996.

Multi-Purpose Canister Certification Strategy and Schedule

Your staff has developed a schedule that supports certification and deployment of Multi-Purpose Canister systems by late 1998. Figure 2 illustrates the major activities associated with certification. According to the information provided by your staff, a combined storage and transportation certification review is expected to take approximately 20 months. This schedule also includes 12 months for a rulemaking to add the System to the list of approved casks under 10 CFR 72, Subpart K. We expect that generic transportation issues will also be addressed as part of the storage cask rulemaking. We are working with the staff to ensure appropriate public involvement in the certification process. The Department has accepted your staff's views of appropriate certification timeframes and we will be revising our baseline schedules accordingly. We will continue to discuss schedule issues with your staff to ensure expeditious certification.

10 CFR Part 60 Design Considerations Technical Report

Disposal requirements will be addressed, to the extent practicable, in the initial design. Of course, they are not fully known at this time. To minimize the possibility that the Multi-Purpose Canister will be incompatible with disposal, we proposed to the NRC staff that we develop a technical report which discusses the effects of a Multi-Purpose Canister on the waste package, the repository environment, and repository operations. I am pleased that the staff has accepted our suggestion and they have provided guidance on the scope and content of such a report. Consequently, we are developing a technical report which we intend to submit along with the storage and transportation applications in April 1996. We expect that the staff will review the report and determine, based upon the current knowledge of the repository, if there are aspects of the Multi-Purpose Canister that would preclude its use as part of the waste package. We hope that the NRC staff can provide its determination by the end of 1997.

Criticality Safety

The Department is committed to developing a safe high-level waste management system that meets our Nation's needs. Criticality safety is one component of this effort. Burnup credit is an important element of criticality safety and continues to be a priority for the Department. The Department believes that efficient geologic disposal at a reasonable cost requires consideration of burnup credit for the design of criticality safety systems.

Burnup credit research and development programs have been underway at several national laboratories for over seven years. The Department has been in discussions with the NRC staff since August 1993 in anticipation of submitting a Topical Report which addresses burnup credit. In October of last year, your staff recommended that the Department pursue

partial burnup credit as a first step towards resolving this complex issue. We have taken that advice and limited our first submittal to partial (actinide only) burnup credit. This report was submitted on May 31, 1995, and we look forward to a timely interchange to address the staff's questions on the burnup credit methodology. We will continue to pursue full burnup credit over the next several years and anticipate submitting another Topical Report in early 1997.

Spent Fuel Management Scenarios

A wide variety of scenarios for the future of spent fuel management can be postulated. These range from extended at-reactor storage to prompt removal to centralized storage, each with or without geologic disposal in the foreseeable future. The variety of legislative and budgetary initiatives already pending in the Congress, along with the technical and institutional uncertainties inherent in the repository program, confirm the wide variation in possible futures we confront.

We are quite conscious of these uncertainties. The Multi-Purpose Canister technology seems to offer advantages in most of the possible scenarios. We have, however, staged the program to permit new evaluations and decisions about the technology as we progress and gain information. The early commitments are modest in comparison to the potential benefits.

We believe that current storage technologies are not adequate to handle the spent fuel population that the program must address. Further, they will not help us respond to the eventual requirements of any long-term storage or disposal scenario. It is prudent, therefore, to encourage the improvement of storage canister technology.

Conclusions

Should the Multi-Purpose Canister System fail to meet the technical or economic test at any point in its development, we will consider procuring other certified technologies that are available in the marketplace. It is probable that these other technologies will play a role in any event, certainly in the immediate future. The only issue is the extent of that role as compared to that of the Multi-Purpose Canister.

We believe that there is a strong policy imperative to develop dry storage technologies that are compatible with the waste management system. Dry storage will play a vital role in any future waste management scenario that we can postulate. The existing technologies will not suffice.

Thank you for this opportunity to brief the Commission. I would be happy to answer any questions you may have.

Figure 1. Multi-Purpose Canister System

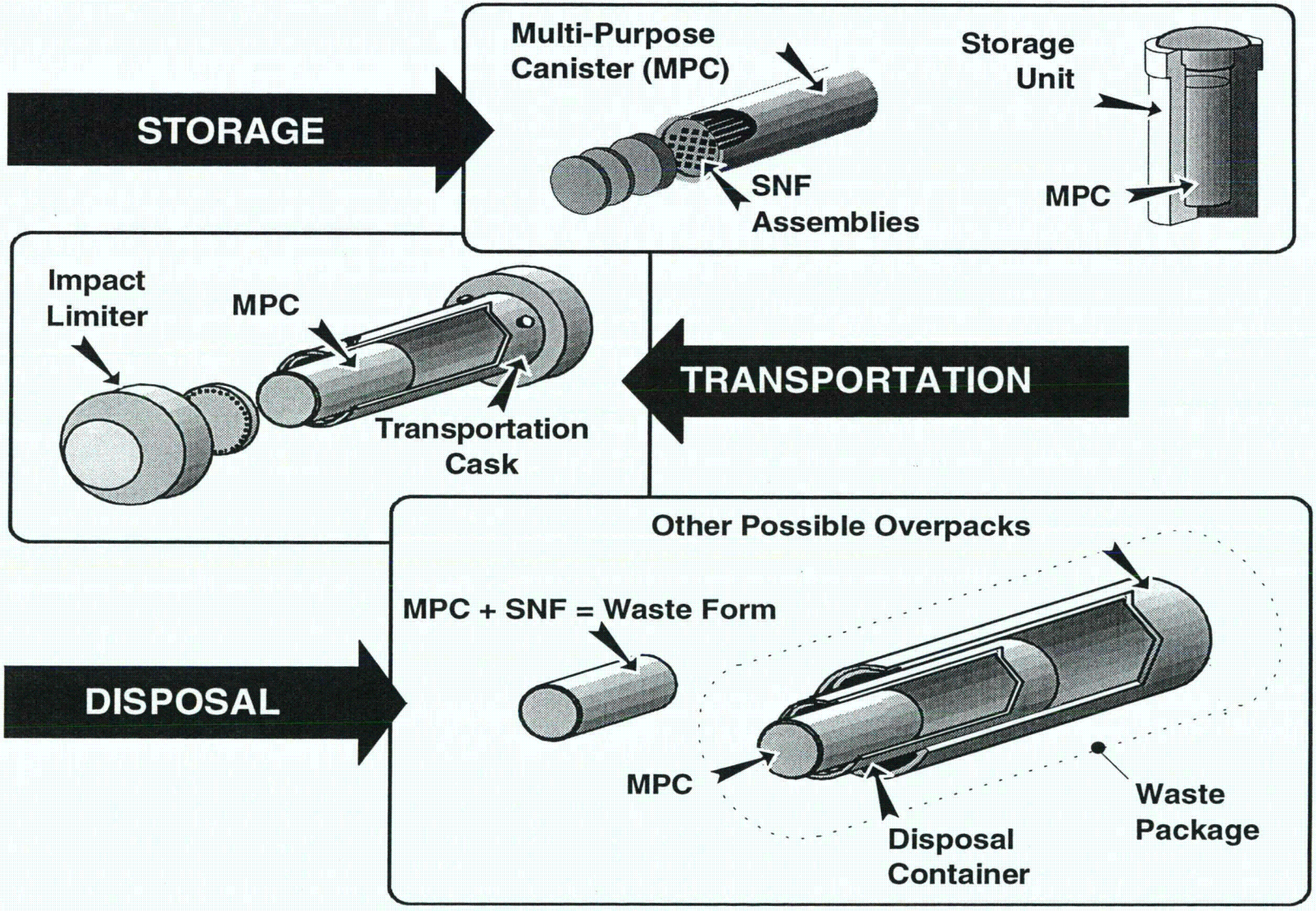

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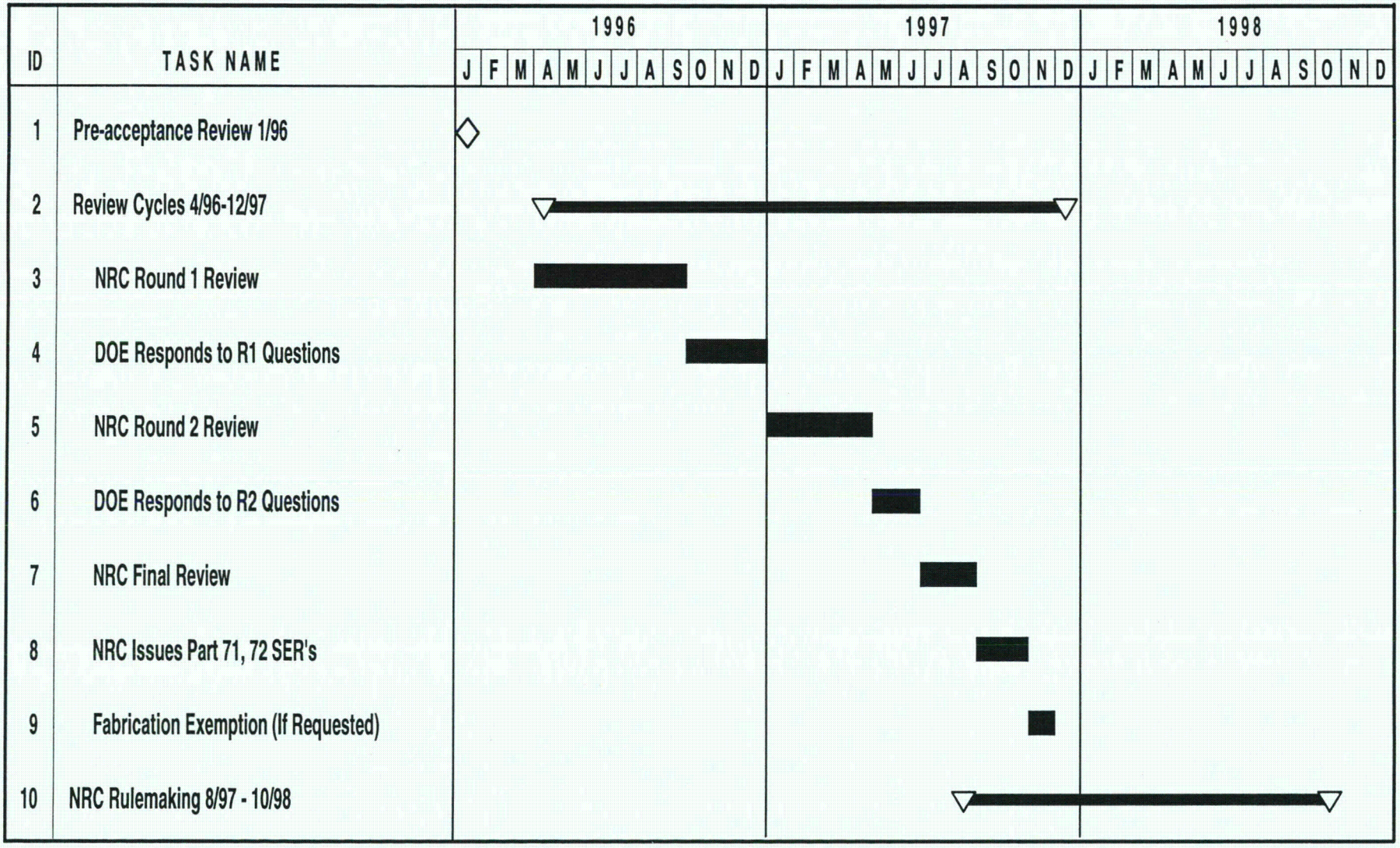
Figure 2. MPC Certification Schedule



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