NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

IN THE MATTER OF:

SUBCOMMITTEE MEETING

on

WASTE MANAGEMENT

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

Wednesday, 19 September 1979

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE MEETING

on

WASTE MANAGEMENT

Room 1046
1717 H Street, N. W.
Washington, D. C.

Wednesday, 19 September 1979

The ACRS Subcommittee on Waste Management met, pursuant to adjournment, at 8:35 a.m. Dr. Stephen Lawroski, chairman of the subcommittee, presiding.

PRESENT:

DR. STEPHEN LAWROSKI, Chairman of the Subcommittee

MR. JEREMIAH J. RAY, Member

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PROCEEDINGS

DR. LAWROSKI: We will resume the meeting that began esterday on the subject of waste management which was discussed yesterday, which included not only high level waste management, but also low level waste and uranium mill tailings. Today, we will continue the meeting with discussions of the fuel cycle program, and as I said yesterday, we are particularly interested in learning as much as we can at this meeting about the priorities of the research program being performed by the NRC and its contractors.

The purpose of our wanting this information is to help with the preparation of parts of the report Congress, due late this year or early next year. I guess everybody who is here today was here yesterday. Since there may be some who are not, let me introduce people at the table.

By the way, I am Stephen Lawroski, acting subcommittee chairman for the waste management subcommittee. Dr. Moeller, who is the chairman, was not able to be here. Jeremiah Ray is another member of the ACRS, who is a member of the subcommittee. And beginning on his left are consultants to the committee as well as to the subcommittee. Mr. Sylvan Cromer, Dr. Shailler Philbrick, Dr. Frank Parker, Dr. Richard Foster, Mr. Alex Grendon, Dr. Martin Steindler, and Dr. Don Orth.

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On my right are Mr. Ragnwald Muller, and on his right — still on my right — Mr. Peter Tam, both of whom are members of the ACRS staff.

I note, Frank, that there are some words of introduction which you have to make, and maybe the rest of your people will have arrived by then.

MR. ARSENAULT: Not quite, but I can start.

DR. LAWROSKI: Please go ahead.

MR. ARSENAULT: I'm Frank Arsenault from the office of research. Tom Carter, from the division of fuel cycle licensing, the office of nuclear materials safety and safeguards, will present the remaining part of this presentation. He has not yet arrived but I'll extend my remarks until he does, or I'll try to open that part of the program and let him take over when he arrives.

But first, I would like to introduce the subject by doing a little review of the background of this part of the SAFER program. In reviewing the safety research program of the NRC, the ACRS has in the past dealt separately with the program of the SAFER division, that is, division of safeguards fuel cycle and environmental research.

This program has evolved in its structure over the past few years, beginning with program elements that dealt with health and environment safeguards and fuel cycle, which included transportation, fuel cycle facilities and waste

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management during the first year. In the second year we dealt with health and environment, fuel cycle waste management and safeguards. And now, we have a program which has four decision units, the safeguards decision unit, the waste management decision unit, which we talked about yesterday, and the reactor environmental decision unit and the fuel cycle safety and environmental decision unit.

I'd like to talk a little about the last two of these, because they're the ones that have not yet been — or until yesterday had not been reviewed explicitly and in full by the ACRS subcommittees.

Earlier this year, the subcommittee on site safety and radiation protection was to meet, noting that fuel cycle and reactor environmental effects did not appear to be otherwise displayed in the program. I inquired as to whether or not it was intended that they be covered within that presentation and it was indicated that whatever the future may hold, that would be a good idea at the time. So, during the meeting of that subcommittee earlier this year, we did present the work we were doing in connection with reactor environmental effects and fuel cycle safety environmental effects. It was a somewhat rapid and general overview of those programs.

So, we welcome the opportunity to review in greater detail that part of the program dealing with fuel

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cycle. Again, in previous reviews of this part of the SAFER program, we have reviewed the research program and only inferred or did in very general terms an overview of the regulatory programs from which the research requirements were derived. Thus, when we saw the invitations to the division of waste management and the division of fuel cycle licensing to participate in the meetings yesterday and today, we took this as an indication that the ACRS wished to review in greater detail and depth the regulatory programs from which the research requirements were derived.

You saw yesterday that considerable emphasis was given to the evolving structure of the high level waste management regulatory program and the existing and ongoing low level waste and mill tailings regulatory program. Research was associated with that presentation in a way that we hoped would make it clear how it was responsive to the needs being identified within the regulatory programs.

We also saw that in high level, the more recent development of a regulatory basis indicated that — we made it clear that we were in the process of review, reevaluation and reformulation of the high level waste research program. Indications of the fuel cycle program, that is an ongoing program. The regulatory basis has not changed drastically in what we are doing in the research and technical assistance programs, on trying to either confirm the

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underlying basis for the regulatory standards or to develop an increased capability for evaluating either safety or environmental effects associated them.

Now, that last point leads me to a question. I hope that it has been clear, but with your indulgence I'll take just a moment. It's clear that the safety research program of the NRC is dominated by reactor safety. Probably so, that is the principal safety issue faced by the agency. There is a question of fuel cycle safety in transportation, fuel cycle facilities and so on. The lack of any safety issue within the fuel cycle program that even approximates the question of reactor accidents means that the safety program associated with fuel cycle is at a fairly nominal level.

The other areas of interest to us in the safety division are the matters of routine effluents, routine operations. It's not a safety issue in the sense of accidents, but it does affect the health and safety of the public in the sense that there are effluents, there are impacts.

The third area is the area of environmental impact assessments. In a sense this is not a safety issue, but it does enter into the licensing process. It's an important and essential part of the licensing process. And in many cases it has been the element of the licensing process which

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has delayed licensing the facilities.

So these are the three areas in which we direct our attention. Then, I think you are familiar with the fact that the probabilistic analysis staff brings to bear that area of expertise in conducting and developing methods for risk assessment. This is the scope of our program.

Now, I'd like to introduce Tom Carter, who is the deputy director of the fuel cycle licensing.

DR. LAWROSKI: Excuse me. Would you introduce all of your people at this time, and tell us where in the organization they fit in?

MR. ARSENAULT: Yes. Since most of them actually are from Tom's division, I'll let him do that.

DR. LAWROSKI: All right, fine. I don't care.

MR. ARSENAULT: In the back row, in the yellow shirt, is Ralph Jones, who's from the office of standards development. Would you tell me what your new title is, Ralph?

MR. JONES: I have two hats at the moment. I'm acting for Bob Bernero as assistant director of material safety; I'm also chief of the transportation and product safety branch.

MR. ARSENAULT: In the front row is Sam Bassett, deputy director of the safeguards, fuel safety division, Mark Gao, who is in the fuel cycle division. I don't know

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the next gentleman.

MR. LOYSON: Peter Loyson from fuels and spent fuels licensing.

MR. ROUSE: I'm Lee Rouse, chief of the advanced fuel, spent fuel licensing branch.

MR. NUSSBAUMER: Don Nussbaumer, assistant director for materials and safety licensing.

MR. BARTLETT: Charlie Bartlett, research.

DR. LAWROSKI: Maybe you could sign a pad and have it Xeroxed later, so that all of our consultants as well as committee members could have our memories refreshed some time later about your names and your roles in this business. Thanks, Frank.

MR. CARTER: Good morning, gentlemen.

(Slide.)

The first chart is somewhat academic, since we have started and Frank has given a brief overview.

(Slide.)

You've had a basic description of the interface between NMSS and research in this area. What we'd like to do this morning, briefly, is give you a brief scope of NMSS fuel cycle activities, how we've broken out our projects, how we would expect to address them this morning with you, then have an informal discussion of the technical issues that we consider facing us, technical assistance projects,

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research projects. The gentlemen that were introduced a few minutes ago are prepared to discuss in detail the projects that were included in your handout of yesterday. It is somewhat thick and somewhat confusing to use, in a way, but maybe as we go through this presentation we can put it in some kind of perspective for you.

(Slide.)

We break up the responsibilities in the fuel cycle materials safety division in three major categories. We have the basic fuel cycle licensing, radioisotope licensing, and certification of transportation packages. The next charts -- and we're going to discuss issues related to each of these three major categories as we go through this morning, and tie those to the projects.

(Slide.)

That's somewhat of a busy chart. I think it does give a very good summary, though, of the parts of the regulations that we're interested in, the facilities at which they impact in the licensing process. It's basically there for a reference chart. It can be used in the future to come back to other questions. That covers the transportation certification fuel cycle licensing.

(Slide.)

In Mr. Nussbaumer's area, we have the byproduct licensing, radioisotope licensing. You can see the

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categories that are covered there, and on this side, the academic medical practice all the way down for depleted uranium, military munitions testing, the various parts of the regulations that impact --

DR. LAWROSKI: What is the number of those licenses?

MR. CARTER: About 8000, I guess, now, isn't it, Don? We have a backlog that we're working off of about 800, 850. We're going to get it down to about 500 this year and then maintain a backlog of about 500 after this year.

(Slide.)

Now, to go back to fuel cycle licensing, I will step through each of these major areas. Frank's people and our people have identified four technical issues which we feel are of importance to us now as a concerted effort between the work that he's doing and the work that we're doing. We have broken out the projects that Frank supports for us, and also the work done by standards, that we feel supports or helps solve these issues, on the charts, under each of the four issues, as we go through them.

(Slide.)

Now, the first issue under the fuel cycle licensing environmental siting, to include siting, 40 CFR 190, Clean Air Act, and trying to drive the offsite effluents down to as low as reasonably achievable, we have a

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series of projects listed there. In the detailed handout we have a brief description of each of the projects. They should follow the viewgraphs as we go through here, in the same order as they're listed on the viewgraph. If there's any particular one you'd want to delve into, we'd be glad to do so.

Under the natural phenomena, NMSS, we have basically three projects there. We're taking a look at natural phenomena, winds, earthquake, floods, for plutonium facilities. We're doing a peer review of those analyses. Then we have another project where we're taking a look at the natural phenomenon impact of the fuel reprocessing and fuel fabrication facilities. Cost-benefit fuel cycle model is used more now in support of NRR for their cost-benefit analyses.

In the reactor licensing and evaluation of reactor cost benefits, we expect to have a NUREG document out this year, toward the end of the year, carrying cost analyses up through about the year 2000 for the fuel cycle and the reactor impacts. The next project listed there in the table S-3 update is really an update of the environmental survey of the uranium fuel cycle, which I am sure you're quite familiar with. The safety and environmental assessment project gives us licensing assistance support for applications. We have that broken down into five different

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projects, which enforce various aspects of the licensing process. We currently have G.E Morris renewal review underway. We have some work with NRS West Valley underway for tornado effects.

Frank, do you want to talk a little bit about the research standard projects?

MR. ARSENAULT: I can address these as we go along, but my feeling is that if you run through this overview to give a feel for the overall structure of the program, the committee has always guided our details by asking some questions.

MR. CARTER: Fine.

DR. LAWROSKI: I want to make sure we save enough time for your part; okay?

MR. CARTER: Okay.

(Slide.)

Next chart, the occupational ALARA, basically, the inside the plant ALARA situation — all of the projects there are either under research or under standards. You can briefly scan those. They're quite extensive. They cover, I think, a very good spectrum of the ALARA problem.

DR. LAWROSKI: Does that cover the criticality safety study, any work related to spent fuel storage?

MR. BARTLETT: Yes, it does. They are developing some specific cross-sections on neutron absorption data for

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typical spent fuel geometries. They're actually using the UO2 fuel in arrays which will provide the licensing people with a better handle on neutron reflection and absorption in closely spaced geometries.

DR. LAWROSKI: So it will include the situation that more and more densified storage --

MR. BARTLETT: Yes, sir.

DR. LAWROSKI: A lot of sites are increasingly obliged to. Alex?

MR. GRENDON: Do I understand the standards division is doing this research, or that research is doing it for standards division?

MR. CARTER: These listed on the right-hand side are funded by standards.

MR. GRENDON: Funded by, but the work is being done by research.

MR. CARTER: No, those are actually funded by standards and being done by a contr tor who is answering to standards, as I understand it.

MR. BARTLETT: Yes.

DR. LAWROSKI: That's why it would be called technical assistance, as opposed to research.

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MR. CARTER: That could be a good point.

DR. LAWROSKI: Would you like to enlarge on that. I think some of our members are not clear about the distinction, and there isn't perhaps very much distinction between something labeled RES and that which is technical assistance.

MR. ARSENAULT: In addition to the contracts which are sponsored by and managed by the Office of Research, there are funds made available to the licensing, the other office of the agency, for what are called technical assistance projects.

The difference in nomenclature — a project is by definition technical assistance if it is sponsored and managed by anyone other than the Office of Research. So in terms of nomenclature, you'll find that usage prevalent. Regardless of the content of the contract, if somebody else does it, it's TA, and if we do it, it's research.

We are guided, however, by the following definitions of what is properly TA and what is properly research, and that which falls under the definition of research, we would expect other offices to solicit our assistance in performing.

The definitions are as follows: technical assistance is the use of outside contractor expertise to aid in the gathering of existing data and its use or the

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application of existing evaluative methodologies to specific problems in the licensing process, where research is the development of new data for that purpose and the development of new evaluative methods or analytical methods and analytical tools. So that is the distinction.

There is a further guideline which is used, because clearly a number of things will fall in the grey area between these two definitions. For example, the application of an existing analytical methods with considerable modifications to that method, well, which one is that? Generally, the additional guideline we use as we make those decisions is that if it is a relatively short-term activity, six months to a year, then something falling in the grey area is sponsored by the user office and is a technical assistance project, whereas if it is a multi-year project and in the grey area, we would ask the Office of Research to sponsor and to manage it.

DR. LAWROSKI: Doesn't technical assistance, in some cases, involve development of new information as opposed to what you said — this collection or gathering of existing data?

MR. ARSENAULT: I think now we get into a semantic question of what development of new information means. If it involves any kind of experimental field measurement or laboratory measurement, then I would say that that would be

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research. If it merely means going out and surveying —

DR. LAWROSKI: It might be research, but it could still be done under technical assistance, or am I wrong?

MR. BASSETT: Ideally, it would not, but occasionally it happens.

DR. LAWROSKI: I'm sure that some times the time schedule would require such.

MR. ARSENAULT: Okay. That's why I indicated there is the additional guideline.

DR. ORTH: I could stand a little clarification on the previous slide, then, which dealt with — there was a group of items there related to the air cleaning business. The total Air Cleaning Conference papers now would probably be a stack at least as high as this table and would probably cover it. So I'm sort of wondering, what are we doing by way of research, or is this a matter of reviewing the available data and trying to derive such things as the HEPA test performance and that sort of thing — those items?

MR. ARSENAULT: In the case of that —

DR. LAWROSKI: I thought we were going to let him get back to that. Is that not going to be a subject that you're going to cover?

DR. ORTH: If you were going to cover it later, fine.

DR. LAWROSKI: I would hope so, when you get into

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the research area, and that's labeled RES.

MR. GRENDON: There is in this stack of detailed projects some description, for example, the HEPA one, tornado tests on the filter and such things.

DR. LAWROSKI: Okay? I'd rather not lose his perspective and keep breaking in. Let him get that done and then get to the nitty-gritty. Okay?

DR. STEINDLER: Can I address a question on this particular topic?

DR. LAWROSKI: Yes.

DR. STEINDLER: In your second very early slide where you listed the four technical issues that are concerned in the fuel licensing, the implication is that these technical issues contain unresolved or incompletely handled bits of information and that each one of these contain areas in which some kind of either technical assistance or research activity is required in order for you to fulfill your licensing function. Are there other technical issues, that is technical topics, for which there are no such unresolved things that need attention by either research or through a technical assistance program -- in other words, in which you're content with the amount of information you currently have of a technical nature?

MR. CARTER: I'm not sure that I understand the question.

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MR. ARSENAULT: I might be able to help with that, Tom, because I think I understand the background motivation for the question.

The simple answer to the question, I think, is yes. But let me illuminate it. Almost all of the requirements for research certainly, and I think this is also true for much of the TA work, almost all of those requirements arise out of a specific problem that is encountered in the licensing progress.

Now an issue that's raised by an intervenor, a need to review and perhaps revise a regulatory standard, something like a review of Table S-3 and so on, almost every requirement for contractor effort -- and certainly this is true for research -- arises out of a need that develops in the course of a licensing process.

Now we're dealing with a fabric of activity by the licensing staff. They do a great many things. Not every action they take generates such a need. So I think what you're asking is, are they simply looking at everything they do and generating some kind of technical requirement out of it? The answer is no. There is generally a pressure point that results in the identification of the need.

Now you could take any one of these and track it back to its stimulus. Have I responded to your question?

DR. STEINDLER: Yes, in part. My only other --

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I don't want to make a federal case out of this, because I see the Chairman mumbling. The only other point that I would raise is obviously the licensing, for example, of a uranium mill which consists of a whole raft of things other than the mill tailing pile. A terrible example, but let me use it.

I assume, for example, that in the area of understanding the safety and license ability of the actual operation of the mill equipment, there is no such overriding technical issue that requires the attention of research or a technical assistance program. If that's the case, then my answer is yes. Only a portion of your licensing activity spills out some technical issues which need resolution. Otherwise it looks to me, the other alternative is that everything you do that has to do with the technical community is elevated to the position of technical issue, which means you've got a never ending, never closing research program.

MR. ARSENAULT: I think I understand the question, and the answer is that on many issues addressed by the staff that don't result in a requirement, I think I can turn the question over to Tom at this point.

MR. CARTER: Lee Rouse, I think, wanted to expand a little bit on this point.

MR. ROUSE: I agree with what Frank is saying.

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The only comment that I would add is using the example of the mills. There is technical assistance work going on in these rather broad categories, like ALARA, that, you know -- looking at it in the sense that these are rather broad, decommissioning and ALARA would cover quite a scope of looking at a given facility. And whether it be technical assistance or research, you have projects going on in both.

I think if we look at the details you'll see that we are covering a pretty wide range of them.

DR. LAWROSKI: I think you should go ahead, Mr. Carter.

(Slide.)

MR. CARTER: I think if I can expand a little bit on your question on this next chart also. In the area of the decommissioning in the fuel cycle, we've got a situation at NFS West Valley with the waste tanks, which I'm sure you're quite familiar with, where one of the tanks which is not being used -- a spare tank -- there was a leak found in the outside barrier.

DR. LAWROSKI: If it wasn't being used, how come there was a leak found?

MR. CARTER: They did a test -- ran water into the inside liner. It leaked out. Really the state of the tank that's in use has come under a lot of question. It's opened up a lot of technical issues. We're having to ask ourselves

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a lot of hard questions. We looked around the country to see who was qualified to take a look at tanks of this nature. It really boils down to Savannah River or Hanford.

We've entered into a contract with Rockwell, the Hanford contractor for DOE. They are taking a look at the tanks at West Valley. They've gone up a couple of times and looked at the physical characteristics of the tanks and how they can get television cameras down inside the tanks, how they can take their samples also in the ground surrounding the tanks. That's an area where we have some real tough technical issues.

We feel we have not turned to research because of the timing. There probably are some things that research could help us do in the long run, but it's something we're trying to solve this fiscal year or next fiscal year, so I think that's an example of the technical issue that has not been elevated to a research project. We have a technical assistance project for it.

Now there are probably others that we don't even have technical assistance projects for that we're working with in the staff. The radiological evaluation of contaminated sites is a very pressing, public, and political issue now. We've got an RFP out, or are in the process of getting an RFP, to develop the capability to go out and survey the sites that are felt to be contaminated, actually

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make engineering recommendations on how to decontaminate the sites, and go from there. That is direct assistance to the staff of an expert nature, giving guidance also, acquiring special instrumentation, and things of that nature, which we feel is not appropriate for the staff to acquire. We feel its better to go through a contgractor or a lab in this case.

(Slide.)

Just quickly, on the alternative fuel cycle, a request was made by Congressman Udall to study the regulatory difference between the thorium fuel cycle and the current uranium fuel cycle. That project is underway -- I'm sorry, it is not underway. Oak Ridge National Laboratory has proposed it. We've had it funded in the budget before. We have not gone into a contract with them. The budget request we had was cut significantly. We're not sure that the money we have available to do that project is enough to satisfactorily work the problem. We are continuing to approach it from a budgetary standpoint.

You have a handout there that indicates what they hope to study. In comparison --

DR. LAWROSKI: Could you be specific as to what types of fuel cycle facilities you are currently studying the decommissioning of? You can just name them.

MR. CARTER: Well --

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DR. LAWROSKI: It is specific sites, as opposed to generic.

MR. CARTER: They're specific sites. We have been giving advice to the Latti Avenue site in St. Louis to move the contaminated materials, the dirt there, out to the airport. Their old landfills are sites that were abandoned some time back.

DR. LAWROSKI: Your job is specific sites as opposed to the more generic studies, like P&L has been doing some work, I think.

MR. CARTER: On engineering. That's right. Ours are very specific, hands-on, actual surveys of the sites.

DR. LAWROSKI: Would that include like low level waste sites that might have to be decommissioned?

MR. CARTER: The ones that have really been abandoned in the past are the ones that we're concerned about.

Don, did you want to add anything?

MR. GRENDON: The description of the project r- doesn't make that very clear. It says in the objective "to survey and evaluate two currently licensed burial sites." Then in the description it speaks of performing radiologic surveys and engineering evaluations at designated sites in Missouri, Illinois, and Tennessee, four in all. That doesn't seem to fit with the objective.

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There are two burial sites that are going to be evaluated, but it certainly turns out there are four in Missouri, which doesn't have a burial site so far as I know, and Illinois and Tennessee, which don't have burial sites as far as I know.

MR. CARTER: We're using that contract to survey two out of four candidate sites.

MR. GRENDON: Are they burial sites, or are they some other kind? The Missouri and Tennessee ones aren't licensed burial sites.

MR. NUSSBAUMER: These are not commercial land burial sites. These are sites for operation. These are conducted where waste material is buried on-site.

MR. GRENDON: "Licensed burial sites" doesn't sound like that kind.

DR. LAWROSKI: You mean it's like the old facility in west Chicago?

MR. GRENDON: They bury their own waste.

MR. CARTER: The Kerr-McGee type of thing.

(Slide.)

Let's move for a few minutes into the radioisotope licensing area. We're interested here in the manufacture and use. We work closely in the standards development area. We give support to the agreement state programs, the tritium releases. Recently at Tucson, Arizona — is a good

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example there — we have done quite a bit in the last few months, especially Dick Cunningham, the Director of the Division has testified at Tucson numerous times in Arizona. He's given support to the Arizona officials in trying to solve that problem.

The first issue --

(Slide.)

Environmental Siting, ALARA, and Clean Air Acts, we've got two technical assistance projects there. We're taking a look at the effluent from radiopharmaceutical manufacturers. Our objective there is to take a hard look so we can come up with a guide that we can assist to the radiopharmaceutical manufacturers in approaching ALARA for their effluents. To be perfectly honest, we've had some problems with the contract. There's been turnover of key personnel supporting the contract. It looks like the contractor may default. This contract will probably be extended into next year. The due date will probably be, I would say, 18 months later than we had anticipated.

MR. GRENDON: Can you tell me where Melville, New York, is. I've never heard of it.

MR. CARTER: I certainly cannot.

MR. BASSETT: It's just a little bit east of Jericho.

(Laughter.)

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MR. BASSETT: Halfway between New York and Brookhaven.

MR. GRENDON: Thank you.

MR. CARTER: The real problem, since you asked about Melville, is the company moved the project down to the Washington area. That's the reason we have turnover in key personnel.

DR. LAWROSKI: Not in any way reflecting unfavorably about the importance of this, but I think you might just give these areas a light treatment.

MR. CARTER: Fine. We've already talked about the tritium analyses at the University of Arizona.

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(Slide.)

The next technical issue, Consumer Products for the radio isotope area-- what we're looking for there is a look that how to dispose of how to educate the public on smoke detectors. We get quite a few requests on how dangerous is a smoke detector in my house, how should I clean up after it, things of that nature.

We try just to give it a generic impact -- we are just trying to get a generic impact statement for the public to use to evaluate smoke detectors and all the type things that they buy off the shelf.

(Slide.)

Occupational safety for radio isotopes licensing, we have one project there for sealed source protection, a relatively small project. Just reviewing the cataloging of sources, standardizing the review procedures, etcetera for the users of the sealed sources.

(Slide.)

We have a decommissioning project under radio isotopes licensing that ties in very personally with the decommissioning project we mentioned earlier.

As the contractor goes through the old Part 30, terminates the file, he looks for questionable areas where we feel there may be contaminated sites as a result or abandoned sites as a result of those ore piles. Then we'll take those

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candidates out to do a hand-offs survey, where we feel it is necessary to do further research in this area.

MR. GRENDON: These are sites that have been abandoned and now you're checking. Now, are there people occupying the sites with some other sort of activity?

MR. CARTER: Some are.

MR. GRENDON: Then what do they propose to do in a case where somebody has built a house or set up a plant of some kind?

MR. CARTER: We have a situation similar to that with the Latti Avenue site; isn't that right, Don? Where they actually have a chemical processing firm who is in there. We go in and give them advice, technical advice, on how to decontaminate, what they have to move, how deep down into the floors they have to go -- into the floors to clean stuff.

MR. GRENDON: And who pays for all that if some new occupant didn't know that he was stepping into that kind of problem in there?

MR. CARTER: There's DOE support. I guess there's legislation that supports up to 10 sites up to the end of 1981 to actually go in and give financial assistance to decontaminate up to 10 sites.

MR. GRENDON: Then the Government pays for it.

MR. CARTER: In some cases.

Now, the Latti Avenue site, Don, who is paying for

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it? Is that the contractor?

MR. ROUSE: In that case we were able to get back to what we say is the former licensee because of some statements he made at the time of the license termination and not being borne out by later surveys. This particular case, the Latti Avenue site, the former licensee is paying for essentially all of the clean-up.

MR. GRENDON: Is there no checkup when the licensee says the place is not clean? Is there no check by NRC?

MR. CARTER: There is now.

MR. GRENDON: But formerly there was not?

MR. CARTER: In a lot of cases there definitely was not. Yes, that's correct. In a lot of these cases, the sites were just abandoned.

MR. ROUSE: Could I add one comment, Tom? These licenses that we are looking at on these sites, basically, the cut was made in about 1965. Subsequent to 1965 there has been sufficient documentation to conclude yes, the site was cleaned up in the survey. There are a number before that time where the documentation is just not adequate. It does not necessarily mean that there is a contamination.

MR. MULLER: Does that include radium?

MR. CARTER: Yes, that's the biggest problem.

MR. GRENDON: Does it --

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MR. CARTER: And yet that wasn't under AEC Control.

MR. ROUSE: It is the same situation with mill tailings. The Government has had to.

MR. GRENDON: But there is the uranium that gave the AEC responsibility. Uranium once extracted, and it never came under AEC's authority.

MR. ROUSE: That's true.

MR. CARTER: I think most of the uranium sites were used for two different purposes. The uranium associated with Latti Avenue wasn't.

MR. NUSSBAUMER: There is radium associated with uranium sites, but in that case our main concern -- we are concerned with the radium.

MR. GRENDON: I understand that. What I thought was being said was that sites that use radium and medical establishments or such which got contaminated in many cases.

MR. NUSSBAUMER: Those sites are not under our jurisdiction. We have to look to the states for that.

MR. GRENDON: That's right.

DR. LAWROSKI: The State is responsible like for the one in Denver? The Institute of Radium Research, or whatever it was called?

MR. NUSSBAUMER: Right. There are several sites in Denver that have been identified and the state is dealing with those.

s-1s-5

DR. LAWROSKI: Go ahead.

MR. CARTER: Let's move to transportation certification.

We have one technical issue which is quite broad, increased protection of public health and safety, which really applies to all licensing functions. We chose that format because (Slide) we wanted to address, really, three common contracts which do all lead toward the increased protection of public health and safety, but not a specific technical issue that's generic to each of them. As a result of some accidents involving low specific activity, transport of low specific activity material, the work study was developed. It led us into improving the package design for the LSA and the Type A packages. We got an ongoing contract to take a hard look at that -- to take a look at really the environment during an accident situation for the packages to see where the containers can be improved.

We also have a project similar to a research project where we are trying to improve the analytical techniques to evaluate the accident environments and to take a look at the response to the various containers through computerized systems codes.

DR. LAWROSKI: Who handles this when it involves criticality other than thermal, referring to the slide before this.

MR. BARTLETT: Steve, I think a comma dropped out.

sls-6

That is thermal, meaning heat transfer, rather than thermo-nuclear.

MR. CARTER: Thermal, comma, criticality.

(Laughter.)

DR. LAWROSKI: I was just worrying about stuff falling in where it got moderated reflected, et cetera. No one else was worried. Go ahead. Sorry.

(Slide.)

MR. CARTER: Okay, one final slide in this area.

There are two major projects which we're quite concerned about and which have not been funded. We've got a fiscal year '80 supplement in for the first one. As a result of Three Mile Island, we are taking a hard look at the fuel cycle facilities as far as the accidents in areas detailed, accident analyses, and incident response to them. If we get the supplemental funding for fiscal year '80, we can do, I think, a little better job in this area. We have staff people looking at it already from within. The limited resources that we have available to bring the program to this project is another area in which Mr. Dircks is very interested in as Director of NMSS, is to establish the ALARA from the effluent releases from byproduct facilities. He's quite concerned.

As a result of the tritium release in Arizona, he's having us take a hard look now at the byproduct facilities.

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We're gathering the data that we can get our hands on from the licensees, from the inspection and enforcement files, to see what the daily releases for effluents in these facilities are. We hope to get further funding in approximately '80 and '81 to pursue this further.

That's basically the comments that I had.

We certainly can expand in any area, in any project you'd like, or we can have Frank discuss the research.

DR. LAWROSKI: I assume you don't have any responsibility with respect to the mining?

MR. CARTER: We do not. That went to the waste management in reorganization. That is right.

DR. LAWROSKI: Even the NRC -- isn't it the Department of Labor that's responsible or the Bureau of Mines? I didn't hear anything.

MR. NUSSBAUMER: We do not regulate the mining of uranium or -- that's correct. Our regulatory program starts with the uranium mill.

DR. LAWROSKI: Thank you.

Is it the Bureau of Mines then?

MR. NUSSBAUMER: I think that's in the Department of Labor.

DR. LAWROSKI: Okay.

DR. STEINDLER: This last viewgraph you had up indicated that you were interested in modeling the vital safety

sls-8

systems and fuel cycle facilities; is that a generic study?

MR. CARTER: No, a specific study on a site by site basis. We are going to try to put a priority on the facilities that we address and then model to a similar extent so that we can see the reaction to fires, explosions, et cetera.

DR. STEINDLER: My question is why are you doing that? Don't you go through this process pretty much doing the preparation of it, PSAR and FSAR for these facilities in response to accidents, building the facilities to withstand them, et cetera?

MR. CARTER: Up to a design basis accident, yes. We're concerned that there are combinations of human error and other naturally induced events and accidents which may be greater than the design basis accident.

DR. STEINDLER: Aren't you in an extremely low risk area with perhaps a high consequence, but a vanishingly small probability?

MR. CARTER: We may be.

DR. STEINDLER: I guess my problem in this whole presentation has been that I couldn't discern the level of priorities of the rather large number of different projects that was mentioned. Would you classify that as a very high priority level? You must feel that important.

MR. CARTER: Yes, we did classify it as a high

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priority item, until we can answer your question.

DR. STEINDLER: That is even though the potential for risk is apparently quite low?

MR. CARTER: Well, the potential for risk may be quite high or the consequences may be high, but we would like to look at the risk side of the equation.

DR. LAWROSKI: But you don't always let the risk settle the matter.

MR. GRENDON: And may I comment on that? I notice that under the transportation that you are considering sabotage, somebody's attempt to blow up a cask perhaps, sabotage a fuel cycle plant might be something where the probability is indeterminate. But if it occurs, it might cause a rather serious accident.

DR. STEINDLER: The Safeguard's people, I assume, have looked at the whole question of, for example, sabotage. Are you duplicating what the Safeguard's people are doing in reviewing not only the methods to prevent sabotage from being effective, cask design, et cetera, but also the consequences of that. Are you duplicating that kind of effort?

MR. ARSENAULT: I'll pick that up.

MR. CARTER: I have been the Deputy Director of Safeguards before I came over to this division. We are not duplicating what they did. They looked at the probability of the act, not the consequences of the act, except into the

sls-10

spent fuel shipment.

DR. STEINDLER: I don't think that's quite right.

MR. ARSENAULT: It isn't quite right. Excuse me. The reason is only in the formulation of the Safeguard's Research Program, before the user request procedure was established, the project was identified to try to assess the consequences of sabotage as well as other violations of security in the nuclear area. It was recognized at that time that there was essentially an infinite variety of variables involved in the sabotage event, and that the best one could do is to develop a set of reference events for which consequences could be established, estimated, and that was the form that the project took.

The project was subsequently reviewed in connection with the user request procedures and it was endorsed by the Division of Safeguards with the exception of those reference events which had to do with clandestine nuclear explosions. The project continued, including reference events in that class. The final report on the project has been delayed for an extraordinary length of time because the contractor discovered just prior to the issuance of the final report, some errors in the computer program by which the estimates were being developed. And he has gone back and he has extracted and is correcting those programs in the computer program.

sls-11

I might point out that I strongly suspect that he is losing money on the project at this point, but he has gone back and he is correcting them. The report will be exposed to peer review when it's produced, and that's the answer to your question.

DR. ORTH: Is that Sandia?

MR. ARSENAULT: No, it's SAI.

DR. LAWROSKI: Let's go on, Frank. I think you were next.

Anyway, we are going to talk about the research.

MR. ARSENAULT: If you note in the program, I don't show up in that, and I'd like to address that point for a moment.

DR. LAWROSKI: Well, we offer you part of the program.

MR. ARSENAULT: I think that during the past day and a half it has become evident to me that there was a mismatch between our perception of the subcommittee's intention and the subcommittee's intentions. And I'd like to address that for a moment before going on and trying to respond to what I now perceive what the intentions were as distinct from what I perceived them to be earlier.

DR. LAWROSKI: I think there is a misunderstanding only on a part of it, because the uranium mill tailings and so on we got almost what we asked for. But go ahead.

MR. ARSENAULT: The fact that the invitations to the

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meetings were addressed to the Division of Fuel Cycle and the Division of Waste Management, and the fact that we have presented our programs in the area of the fuel cycle research to the earlier subcommittee, led us to conclude that the focus of the subcommittee's attention would be on the regulatory programs from which the research programs were derived. We did, of course, join with the NMSS people in preparing the presentations.

So, you see the research program is today presented in the context of that regulatory program which was our intention yesterday. I think it came across fairly well. And of consequence, the focus was on the presentation by the Regulatory people as distinct from the research people.

Now, having made that observation, I think that it is pliable, nevertheless, to go to material that was prepared for this presentation and run through it and addressing some technical detail of the individual project in research in this decision unit we do not have.

I would like now to address some factors that relate to the question of priorities. In this decision unit, unlike waste management, we do not have an expanding program. We have, in fact, a diminishing program. The budget for this decision unit has to climb, I think, every year or at least it's certain that it climbed significantly in the current fiscal year. As a consequence, we have been forced on several

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occasions to go back to the plant program and to prioritize, to cut our projects. So, what you see in front of you is the list of the research projects that have survived this process.

MR. GRENDON: Where do we see this?

MR. ARSENAULT: You see it in two respects: Each of the slides shown by Mr. Carter on which the projects are listed together with the indication of the office which sponsored the project, if you look through these papers, each of the projects with an RES beside them, the sum total of those projects constitutes our program.

Now, you will notice that it isn't presented as a coherent program. It is presented in the structure of the Regulatory program, because that was our understanding of your interests.

DR. FOSTER: Frankly, you say this decision unit, is that the fuel cycle decision unit?

MR. ARSENAULT: Yes. The SAFER Division has four decision units. One of them is a decision unit entitled fuel cycle safety and environmental effects. That decision unit deals with or covers research on all aspects of the licensing process, associated with fuel cycle. And fuel cycle, of course, deals with everything except power reactors, and waste management facilities. That includes the reprocessing plant, should there be one, and the waste storage on site for those plants. At least I understand that's the current assumption.

End t-3

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I think the backup list, the detailed list, that was distributed gives you a very brief statement of the objective and character of each of the projects that you've seen listed. I've glanced through it, and I've noticed that it is now always easy to tell which office is sponsoring the project. But I do believe that the research project will always be visible as research.

Now I also would point out that we now have in the SAFER Division a computerized project management system in which we will have an updated statement. We're currently going through the exercise of reviewing all of the statement's objective and work scope of the SAFER Division, and we will have possible this month, but very soon, an updated version of all of our projects.

The other things is that as a result of the Congressional action on the fiscal '80 budget, in spite of a diminished budget plan developed by NRC, they've cut back still further on the amount of funds available for this decision. As a consequence, I've been in touch with Tom Carter and there is a memorandum somewhere in the mail or about to get there which presents him with a current statement of all of the current projects in our program and the way in which we would propose to a Congressional cut. And this would indicate what priorities we associate, at least it would indicate where the low priority items were in

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our view.

I think what is very important is what his view of priorities is, and we will consult and take action in the '80 program on that basis.

Now you can go further and say, well, of the projects which are left in '80 after you've taken all of these cuts, which ones are high priority and which ones are low priority. You run into a little difficulty there. One can list individual projects in order of priority, but as I indicated yesterday, when management is faced now with another squeeze, a number of different variables enter into it. Would you, in fact, drop off the bottom project on this list? Or would you rather squeeze down on several projects and maintain some activity in each of these areas?

A decision cannot be made unilaterally by the Office of Research, and I'm not even sure it can be made in a way that would be a constant for a significant period of time.

So I can provide you with the list of projects that I'm using to communicate to Tom what our assessments of priorities are. In a matter of some days or a week or two, I guess, we can give you back the list that results from our consultation on that, and I suppose that we could list in some order of importance the projects that remain in the '80 program as a result of that exchange.

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I would not suggest, however, that any reduction in budget in this decision would result in the termination of these residual programs.

DR. LAWROSKI: Frank, for the record, I'd just like to quote from two memos that were sent with you as one of the recipients — one dated July 19, which states that we'd like to have the waste management program be discussed along the following guidelines. This is quoting from July 19 — "the goals of the NMSS and the RES programs, priorities set by these offices in meeting these goals, a description of various projects, budgets, and time schedules."

Then almost one month later, August 14, another letter from the ACRS staff that says -- the discussion of the subject matter and the title of it is Annual ACRS Review of the NRC Research — the goals of the fuel cycle program. This is addressed, in this case, to Mr. Cunningham with carbon copies to you as well as to Mr. Martin — "goals of the fuel cycle program, priorities set to meet these goals, description of various projects." I find it surprising to hear you say today that you didn't know what we were expecting to get at this meeting.

This meeting originally -- the reason for the July 19 memo was that we had expected to have this meeting on August 28, 29, but it was delayed partly as a result of a

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request from you people as well as perhaps someone else, and Mr. Martin.

Okay. I just wanted to make it clear.

MR. ARSENAULT: The interests of the Subcommittee were not obscure. The fact that you wanted to understand the basis of the program and priorities --

DR. LAWROSKI: I thought, as you put it earlier, that you weren't expecting --

MR. ARSENAULT: I'm sorry. The point that I was trying to make is because of the fact that we had presented our program earlier, that question was addressed to Mr. Cunningham rather than to me.

DR. LAWROSKI: It had not been addressed in the kind of depth, because this was in connection with providing the Commission by the time of July -- they actually wanted it perhaps a little earlier -- for their budget review process.

MR. ARSENAULT: Yes. I'm not suggesting that we don't --

DR. LAWROSKI: I don't want to continue the argument.

MR. ARSENAULT: I was simply explaining why the presentation was structured as it was. And you'll find, for example, in the material you receive today that the research program was not presented in the terms of "the research

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program" but rather in the context of the regulatory program. And that, of course, makes it a little more difficult for the Subcommittee to review it in terms of its interests.

And I was explaining why, and for that, I apologize.

DR. LAWROSKI: Okay.

MR. ARSENAULT: In any case, I have indicated to you where we stand with regard to prioritization, and we can make available to the Subcommittee this list that I am sending to Carter. This will be an indication of the SAFER Division's prioritization. It will not reflect, until he has had a chance to review it and consult with us, the Division of Fuel Cycle's prioritization of these programs.

And we'll be happy to make that available when it's ready, which should be soon.

MR. GRENDON: Did I understand you to say that in your first cut at setting priorities that you have not abandoned any project?

MR. ARSENAULT: No, that's not quite true.

MR. GRENDON: Then I misunderstood you.

MR. ARSENAULT: We are proposing to terminate a few projects in the Fuel Cycle Division. In particular, I believe one of the criticality projects is proposed for termination and another is proposed for termination but with

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some continuation of work to produce the results of work already done.

I don't recall whether there are any other projects proposed for termination.

MR. GRENDON: And of course other divisions may say terminate this or that, and you would have to settle that between you.

MR. ARSENAULT: Yes, exactly. We are indicating our own set of priorities, but since we're responsive to their needs, we're going to want to hear from them before we actually go ahead.

DR. STEINDLER: It isn't altogether clear to me, Frank, why it is that you set priorities at all. Specifically, I guess my view of the research function is a support for the licensing function. It is at the behest of the licensing group and their technical projects and their technical issues, as they see it, that this work is actually being done, albeit under your immediate jurisdiction.

Why is it that the priorities are not set entirely by the customer of the final output?

MR. ARSENAULT: Prioritization -- let me back up one more sentence. As I tried to indicate a couple of times yesterday and today, prioritization is not a simple one-dimensional matter. There is the question of the importance to the regulatory process, and the importance and

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urgency are two dimensions in that respect. It may be that something needs to be done that is less important than something you have a little more time to do. So there is that two-dimensional aspect to prioritization.

The other is, when you're dealing with programs that exist as distinct from those that you are planning to do, there is the question of extracting fullest value from the work already done. Now if it turns out that a project started has absolutely no utility, that question does not enter into it. You simply terminate it. You take your losses, and you're finished with it.

On the other hand, more frequently what happens is that the project on going has diminished in priority but still has relevance and value. And what you try to do then is, within the context of the resources available, terminate it in an orderly way so as to take full advantage of the work already done.

Now this is a management aspect rather than a regulatory aspect to prioritization. The other aspect which enters in, which in itself is a complex issue, is what's happening to the available resources. If we run into a situation where we may expect resources to diminish in subsequent years, well then a project shouldn't get started this year, although you have resources for it, if you feel you're going to have to terminate it when it's half way

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through. These are management aspects to it. Prioritization in the sense of the impact and the importance to the regulatory program, I think, should come out of the licensing offices. That's why I sent the program proposal to Mr. Carter.

Some of these other matters cannot be evaluated by them as well as by the Research Office, so it's a collaborative effort, and I don't see any way to avoid that.

DR. LAWROSKI: However you are going to do it, would you please go on with what you had earlier indicated you would do, following Mr. Carter's presentation. We all agreed we would wait and wouldn't interfere. I think Mr. Orth had some questions. He said he'd wait.

MR. ARSENAULT: What we said we would do is discuss any one of these projects in detail if there were questions on them. For that, I will rely heavily on Mr. Bartlett to assist me.

MR. GRENDON: This was just presented to us. I found it on the table when I arrived this morning. There was no opportunity to look these over.

DR. LAWROSKI: Can you give us a summary, please?

MR. ARSENAULT: It's also true that all of the research information in this packet has previously been submitted. I believe we gave a copy of all of the project briefs for both the fuel cycle and reactor and environmental

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decision units. I think it may --

MR. BASSETT: Frank, if I coould make a suggestion, perhaps what Dr. Lawroski would like you to do is run down the topics and let them pick up any they want to talk about.

MR. ARSENAULT: Fine. We'll be happy to do that. I'm going to ask Charlie Bartlett to run through these research projects, then.

DR. LAWROSKI: We did not address the question of priorities and so on. Correct me if I'm wrong.

DR. STEINDLER: It may well have been a different subcommittee.

MR. GRENDON: It must have been a different one. It never came to me.

MR. BARTLETT: It was Dade Moeller's Subcommittee on Radiation and Protection in Siting.

MR. ARSENAULT: It was the basis for the July, '79, report.

DR. LAWROSKI: That's not what we're discussing. That's a different subcommittee. There are a bunch of other subcommittees.

MR. BASSETT: We'd like to emphasize again, we're anxious to go through this to the extent that you want.

DR. LAWROSKI: All right.

(Slide.)

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MR. BARTLETT: I think if we can, we'll back up to where Tom was trying to lead you earlier and point out some of the technical issues that the NMSS people and the standards people feel they faced and what kind of programs we, as an integrated commission, have initiated to resolve these questions.

As Tom said, he's got problems with siting, fuel cycle facilities. He's got the EPA's uranium fuel cycle standard. He has the new amendments to the Clean Air Act and the Commission's own ALARA requirements.

Now to satisfy our responsibilities, the licensing and standards people believe they need more information in these specific areas. Specifically, they have many plutonium facilities which they have licensed which are not all up to NRC's tornado protection standards. There is a review of these facilities to see how well they would survive. They are doing, for the purpose of cost benefit analysis required under NEPA, some fuel cycle cost economic studies. They are required -- as I don't think we have to get into -- the S-3 update.

MR. ARSENAULT: Excuse me. Was it the Subcommittee's intention that Charlie address each of these projects or only the research projects?

DR. LAWROSKI: Only the research, please. Thank you.

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MR. BARTLETT: That will get us back down to this point here where, for the licensing people, we are conducting tests of full-scale HEPA filters to NRC's Region One tornado requirements, i.e. a three-second three psi ram loaded and unloaded filters to determine both the mechanical response and the efficiency of these filters.

DR. STEINDLER: Steve, question. Should we simply let him go through?

DR. LAWROSKI: Yes. Let's let him go through to get some coherence out of it, because he's going to limit these to the RES as opposed to technical.

DR. PARKER: Just in the section, though. We can stop after each section.

DR. LAWROSKI: Yes, after each section. Absolutely. I don't want to have us forget what we were going to ask. Thank you.

Go ahead, please.

MR. BARTLETT: We have another program in which we are trying to develop or examine the feasbility of developing some sort of an empirical correlation between aerosol generation and behavior and initiating events specifically relating to fuel cycle facility types of accidents, to provide a little better handle for the licensing people on what sort of aerosols a ventilation system should expect to see and what sort of protection

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various components in that ventilation system ought to be provided with.

We have -- and I have to apologize for this -- it's not strictly a noble gas risk study, a noble gas retention risk study. The probablistic assessment people, Mike Cullingford and Curry in particular, have initiated with Savannah River a study to determine the feasibility the state of existing information which might support a full-scale probablistic assessment of fuel cycle activities that, as Don may be familiar, was initiated, I think, a couple of years ago before the nonproliferation policy really took hold. It subsequently, to the best of my recollection, has been focused principally on the noble gas retention and on-site storage.

Alex?

MR. GRENDON: That doesn't seem to be what your project deals with. It's the long-lived gases, I-129, C-14, and Krypton-85, it says here, not the noble gases.

MR. BARTLETT: I'm sorry. Krypton-85, Carbon-14, tritium and Iodine-129.

MR. GRENDON: The emphasis is on long half-life, not nobility.

MR. BARTLETT: I stand appropriately corrected.

That takes care of the three research projects that support these regulatory requirements.

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DR. ORTH: I guess I have a question at this point.

DR. LAWROSKI: Okay. Don and then Frank and then Martin.

DR. ORTH: Again, just from the standpoint of not quibbling about the details of the program, but of the objectives and priorities and the money and things of this nature, there has been a fair amount of work done at other places already and documented on such things as the accident aerosol behavior. Is the research in this case to review and codify and arrive at something like standard ways of approaching it, or is it to actually do more research?

MR. BARTLETT: It is not, Don. Your question is — yes, to both parts of that. The first thing will be an attempt to take the information available, which a lot of people have generated — Argonne, for one — standards has a program ongoing right now. It will develop a program, if required, if feasible, to provide the licensing guys with a nomograph, if you will, in terms of what sort of aerosol quantities they can expect from certain types of energetic events such as explosions to see on the basis both of examining past events and looking at the state, at the physics involved, whether or not one can develop these sorts of correlations to provide, if you will, a handle where the licensing people can — to which licensing people can go and

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come up with some of the basic information they need to make their analysis.

Now have I answered your question?

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DR. ORTH: If I understand it right, tell me so. What you've really said is that you're going to see if you really know enough already if you only put it together.

MR. BARTLETT: That's correct. And if additional work is required, these sorts of experiments will be initiated.

DR. STEINDLER: My question deals with the cellophanes One, the HEPA filter test and performance study has been going on for 25 years. Why does it continue and when do you think that you're going to have all the answers?

MR. BARTLETT: Good point. I have to back up a little bit and give you some additional background.

DOE or ERDA or the AEC back several years ago initiated a program with LASL. The Division of Operational Safety initiated a program with LASL to develop a computer code which would predict velocities, flows, pressure drops across rather complex ventilation systems in fuel cycle facilities. Okay?

When subjected to pressure transients such as explosions, tornadoes, and things of that nature —

The program works very well for straight ducts unless you put something in that duct like a damper or a fan or a divider or a baffle, things like that.

There is no data to support, to plug in an element of that computer code which will model the impact of these

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additions to a straight ventilation duct.

We have been conducting tests of full-scale HEPA filters under these high velocity transients to provide input, first, input into that computer program so that they can model these sorts of filter banks and filter rooms. And secondly, to get a better handle on the mechanical response of full scale filters when subjected to these pressure transients in which the information is simply not available.

Now this program in terms of its continuation, the HEPA filter tests ought to be finished essentially, I think, if not the end of this year, the middle of next year. What we will try to do, if feasible, is to put in fans, you know, full sized fans, to see whether you get backflow in those fans when subjected to those pressure drops.

That will provide a very good validated ventilation system code which everyone can use — designers, the licensing people. It will provide for the validation of certain modules in that code which are not now available.

DR. LAWROSKI: Frank, did you have a question? You were pre-empted by Martin.

DR. STEINDLER: Let me just finish up.

One other thing, I guess, to address to Mr. Arsenault it would be useful if a program brief of the kind that we have would also somewhere indicate when this project started.

Some of these projects I have heard for a number

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of years and one wonders, you know, why they continue.

Finally, I don't know whether you really addressed the question that Don asked. Let me address it in terms of the accident aerosol behavior. The DOE program on accident aerosol behavior lasted for something -- the better part of two years.

It produced what I guess, I think, is a significant amount of information run through Savannah River.

Are you building this program on top of that, or are you duplicating what's been done by DOE as your contractor?

Are you aware of what's been going on there and how important do you think this whole program is?

MR. BARTLETT: Marty, I would hope that we are certainly going to build on what you guys have turned out in this area. And this, as I recollect, is a rather recently completed activity, and I am not sure whether that information has been published.

But I know our principal investigators have been talking around, and I can assure you that there will be no duplication of work.

MR. LOYSON: I might comment on that. It might help you in another area as well. We in licensing regard this project as one of the most important points that research has conducted for us.

It might give you a little help on prioritization.

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It's a comprehensive and difficult project, and we have three people in our branch monitoring and working with research and with three contractors.

If you'll notice, there are contractors from LASL, from Oak Ridge, and Battelle Northwest, each in their own areas of expertise, but each being coordinated very carefully by us because we know that they can get out of hand if they were all left to go their own ways.

So we have instructed them through the research people not to invent any new wheels, specifically. And they are looking at all of the data that have been published in the past.

DR. LAWROSKI: Frank?

DR. PARKER: I guess my question is very much along the same lines. I thought the work was done at Oak Ridge, I thought by NRC a number of years ago on ALARA, going through each component of the fuel cycle dealt specifically with management of the gases.

I was wondering how this differs from that work.

MR. BARTLETT: Frank, I want to say that I'm aware of all the work that Ray and those people have done for all the fuel cycle facilities. But I think the thrust, and if you look at that project brief, I think you'll see the thrust is probabilistics. What is the probability of an accident? Are you going to incur greater risk to the public by retaining

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and shipping — pardon me — greater risk to the public by retaining, storing and shipping some of these noble gases — carbon 14 and tritium residues — than would be obtained by just releasing them to the atmosphere?

DR. PARKER: My recollection is that part of that, there were some publications that dealt precisely with those questions: Are you better off storing it, releasing it, or transporting it?

MR. BARTLETT: I want to say that I am aware of certain of those things and it's my understanding, and I'm sorry that the probabilistic people could not be here this morning to participate, but my understanding is that this is a truly probabilistic risk study which was not carried out. It was assumed that it was either a go or no go with respect to those ALARA studies. And I do not believe that they got into the impacts of accidents, either in storage or during transportation.

That is my recollection.

MR. ARSENAULT: An additional point. The project has been carried out at quite a low level of effort, both with regard to contract or resources and staff. And they're going about it quite deliberately in trying to identify exactly what does need to be done and how to get into it.

So I don't think there's a problem of duplicating any additional effort. It's quite a deliberately paced program

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MR. BARTLETT: I want to say, too, Frank, that this program ends up in the fuel cycle area because the retention of these long-lived gases and products is going to be accomplished at the fuel reprocessing plant.

But I think the program was initially initiated by the waste management people, not that I'm passing the buck or trying to, but they have some questions with respect to the risk of storing and transporting.

Does carbon 14 have to go to a repository, things of this nature — and this information is going to be useful to them in making those sorts of judgments.

MR. ARSENAULT: Excuse me. This is the second time this has happened. You also saw this project presented yesterday.

And the fact is that the facilities — if the reprocessing facility will be licensed by the fuel cycle division and if there is a gas collection and retention operation at that facility, that will be licensed by the fuel cycle division.

Once the gas is collected, if it's taken somewhere for long-term storage or ultimate disposal, it becomes of interest to the waste management division. And that's why there's this interconnection.

DR. FOSTER: I have a question or two along the same lines relative to these long-lived gases here.

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First off, my personal view is that this kind of thing is a very worthwhile kind of thing of a research project because it could, in fact, lay the groundwork for how these things really ought to be handled in the overall best interests of keeping dose down.

Secondarily, I wonder whether this program actually got started following the EPA regulations which came out.

MR. BARTLETT: Dick, I'd like to say my recollection of that project, and this goes back to when we were in Sanders, this program of risk assessment, okay, for fuel cycle facilities, fuel reprocessing facilities, in particular, was initiated to support the development of NRC's siting standards for fuel reprocessing plants.

Okay?

Then we entered into a period of turmoil following the non-proliferation policy decision by the Administration and everybody was sort of saying, gee, what do we do with all of these things. Okay?

This is the thing that is continuing, okay?

So does that answer you?

DR. FOSTER: Not really, but I'll accept it. The other question that I had is perhaps best directed to Mr. Arsenault, and that relates to long range research. We've discussed before that much of the kind of thing which comes up and has high priority might be classified in the brush fire

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type of thing as something which is badly needed yesterday and we found out about it today and we want the research information tomorrow.

Consequently, those sorts of things are apt to get immediately high attention. But at the same time leaving out things for the future which say, where are we going to be? What are our problems going to be five years down the line? When we have a likelihood of perhaps having gotten the research done and gotten the report out on the subject, where do we stand on that sort of philosophy within NRC's and its research program as a whole?

MR. ARSENAULT: There are a couple -- I think the question can be subdivided into two or three areas. One is the question of truly long-term research, what I would put under the category of long-term research, which means that somebody looks ahead and identifies what the structure of the nuclear industry will be in some future time, what the regulatory objectives will be at that future time. And they do change.

One tries to establish some rational program of research and study to prepare the agency for these future responsibilities. What's the status of that? Very little of it is being done.

The second category of long-term research is to engage in activities for which the need is current but the

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research simply cannot be done quickly and the results will not be available for a period of some years.

The LOFT program, I think, is a good example of this. The program was established to answer questions that existed some time ago. But it was recognized then that the answers wouldn't be available overnight.

We have some programs like that. And the next question, one of the major problems connected with that kind of program is maintaining stable resources to perform the program over the period of time that is necessary and that sometimes is awkward.

I think that answer to where does that kind of research stand — well, I think it's in pretty good shape. But each year brings its own hazards.

Now the next question is with regard to more specific and focused problems encountered in the licensing process, where the research to be done. And the results, now we're talking about time spans of perhaps a couple of years. And the results may not be available prior to the decision that's being made in this connection.

And so the question, as we discussed this yesterday is: Should the research be done at all since the decision has to be made before the research results are available?

I also mentioned yesterday that it should be done. It's a question of confirming the assumptions that were used

ssh 1 to make the regulatory decision and quantifying margins of
DH 2 safety for the uncertainties associated with decisions.
3 Now that's a long-winded answer to your question,
4 but I really didn't see any way of answering it.
5 DR. LAWROSKI: Can we go on because we still want
6 to hear -- Frank, by the way, could you give us the sums of
7 money for this program that you gave us yesterday for
8 everything that was covered yesterday?
9 MR. BARTLETT: Steve, I have to apologize for that.
10 We have been, as Frank was indicating, trying to prioritize
11 on '79 and '80 and shuffle things around.
12 DR. LAWROSKI: No, the dollars in the total fuel
13 cycle.
14 MR. BARLETT: In the total fuel cycle, it runs 3.1
15 in fiscal '80.
16 MR. ARSENAULT: Down from a planned $4 million.
17 DR. LAWROSKI: Three point what?
18 MR. ARSENAULT: I believe, in fact, it's 3.2.
19 DR. LAWROSKI: 3.2 down from --
20 MR. ARSENAULT: A planned $4 million, which is down
21 from the preceding year.
22 Well, the preceding year included waste management.
23 So I'd have to develop a parallel. We will give you some
24 additional details on that.
25 DR. LAWROSKI: Thank you. Go ahead with the next one.

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MR. BARTLETT: The next occupational issue is occupational ALARA and ALARA in general.

I think that most of you gentlemen are aware that our confreres in standards are initiating a review of 10CFR20 as a result of the new ICRP dose models, new guidance from EPA, and things of that nature.

So there is an appreciable amount of research which is being conducted on dosimetry, health effects, inhalation, digestion, deposition of the various radionuclides in various organs of the body, soluability in bodily fluids, things of this nature.

Okay. And as you can see and as Tom mentioned before, there are some ancillary projects being conducted by standards in basically the same area. This is to support their calculation of dose, to support their development, if you will, of an Appendix I for other than reactor facilities.

I use the reactor analogy. You cannot measure the levels of radioactive material in the environment that will produce Appendix I doses. They have to be calculated.

So these dose calculations, the dosimetry is a very important part of that.

DR. LAWROSKI: Are you through?

MR. BARLETT: I'm basically through. I have Dr. Judy Foulke over here if there are any specific questions on the technical details of that program because I am not a

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radiobiologist.

DR. LANROSKI: Okay, Alex.

MR. GRENDON: One of the projects which Judy Foulke apparently is project manager of, which, if it's on schedule, will be completed by the end of this month -- I wonder why it was ever started -- leakage tests of self-contained breeding apparatus.

The Bureau of Mines has been working on that for years. What's new about it?

MR. BARTLETT: It's very funny because I heard this discussed the other day that people are batting this back and forth.

The Bureau of Mines, or NIOSH, who have responsibility for the self-contained breathing apparatus, say that this is such a small application, okay, the radioactive material, that they're not going to bother with it.

MR. GRENDON: The point is not what material. Self-contained breathing apparatus is an outward flow apparatus. Who expects anything, radioactive or non-radioactive to get inside this containment.

DR. FOULKE: It has to do with the threat to the individuals. What LASL has set up is an anthropometric test panel, 25 individuals covering a range of face sizes.

NIOSH doesn't get into that at all. They look at the diaphram, the regulators, things like that. Not the

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quantitative fit tests to an individual. And they've developed this representative panel because a person with, you know, a small face is going to have more leakage wearing that same mask than a person with a different facial structure.

MR. GRENDON: It's been known for 50 years -- well, since World War I -- that if a face mask doesn't fit, of course, you can get leakage through it. But these tests have been made for the effects of fit for many years and with self-contained breathing apparatus, as I say. With positive pressure inside the mask, fit becomes less important.

Has this investigator found any leakage inward on a self-contained breathing apparatus?

DR. FOULKE: I don't have the results for those right now. I think they've been rather good.

MR. GRENDON: Well, they'd better have been.

(Laughter.)

MR. GRENDON: What I'm saying is I couldn't conceive of your finding a useful result from it. Somebody thought apparently you might.

MR. ARSENAULT: Excuse me. But the self-contained breathing apparatus does develop a negative pressure in the mask. I think you're thinking of a flow-through device in which the supply of air is constant and one breathes out of the stream.

The self-contained breathing apparatus depends on

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a negative pressure inside the mask to actuate the pneumatic valve.

MR. GRENDON: Does it? Not to my knowledge.

MR. ARSENAULT: The Scott air pack does. A self-contained breathing apparatus generally involves a compressed air tank and the demand valve is actuated by negative pressure.

MR. GRENDON: Negative in respect to pressure from the tank, but not with respect to the atmosphere.

MR. ARSENAULT: I think, sir, that you will find --

MR. GRENDON: That I'm wrong in that case. I never heard of it, but you may be right.

MR. ARSENAULT: Generally, they're adjusted so that there is no air flow on this and a negative pressure occurs.

MR. GRENDON: But as I say, negative with respect to the setting of the pressure valve, not with respect to the atmosphere.

MR. ARSENAULT: You can adjust them to be free-flow devices.

MR. GRENDON: If you have it negative with respect to atmosphere, then forget the self-contained breathing.

MR. BARTLETT: Alex, I think the results of some of these tests have shown that the factors the protection factors, and I'm not expert in this, so you can nail me to the floor, but the procection factors which have been assigned to

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certain of these face masks have been a lot lower, i.e., there is more leakage than people had anticipated as a result of these tests.

Now that is new information. It is information that has not, to the best of our knowledge, ever been generated.

Now we're getting probably a lot more quantitatives than the people that have been firemen or other people going in to hazardous areas need to be, just by virtue of our regulatory responsibilities.

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MR. GRENDON: The hazard for which it's been used. There have been serious hazards. Cyanide, chlorine gas, all sorts of serious hazards.

MR. BARTLETT: We will be happy to furnish additional details.

MR. GRENDON: I'd be interested to know if any positive results came out of that.

DR. LAWROSKI: How long has been the duration?

MR. GRENDON: One year. It was supposed to finish on September 30th.

DR. LAWROSKI: Frank and then Dick.

DR. PARKER: I had a question on the performance testing of the health-physics survey instruments. I see you haven't yet assigned it. I was wondering, I didn't see anything about it, the KV measurement neutron systems which apparently is a critical lack of -- I wonder if you were going to address that or were going to suggest someplace else, or what?

MR. BARTLETT: Frank, if you will see that that is a standards development project, which I think if I'm not mistaken, from scanning those project briefs, again the standards people could not get the right guy here today, but I think they are going to focus on these.

DR. PARKER: It's just not in this package; is that what you're saying?

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MR. BARTLETT: I believe that is my understanding. I will try to provide you with additional information.

DR. LAWROSKI: In view of this exchange, if and when the report becomes available could you see that we get copies? Especially I want to make sure that Alex gets a copy.

Let's see, Frank, did you have further questions?

Dick, you're next.

DR. FOSTER: Relative to occupational exposures, recently NIH had an interagency committee, so-called Massey Committee, stating how research on health effects of radiation might best be done throughout the government agencies. I think NRC had a representative on that. The report is out. It has gone to the president. I am wondering whether any of the things which you have ongoing might be impacted by the recommendations of that group.

MR. BARTLETT: Dick, I personally have to confess ignorance. I am aware of that NIH study group in general terms, but I am not aware, nor have I seen the results of that study. And should we be wary of this, I am sure we will examine it.

DR. FOSTER: I think you should, because there are some things which are involved here relative to occupational exposure,.which could be things that could get involved with epidemiological kinds of things which could be very heavily impacted. Whether NRC does these, or what their involvement

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is --

MR. BARTLETT: HEW or someone like that.

If there are no further questions with this we will move rapidly on.

(Slide.)

This again reiterates the --

DR. LAWROSKI: Just a second. That is not relevant to this. But the thought just occurred to me, in regard to the Three Mile Island accident, have you people been asked or are you planning on doing any work that would prepare for the time when the fuel from Three Mile Island, No. 2 reactor, has to be removed and shipped someplace? That fuel is so different from anything that's been shooting around.

MR. ARSENAULT: The answer is no, we have not.

DR. LAWROSKI: You have not?

MR. ARSENAULT: We have not been asked to.

DR. LAWROSKI: I know you folks have to find a customer, but sometimes you can also suggest to somebody who might be the potential customer.

MR. ARSENAULT: We have supported the TMI activity, people -- doing source term studies, making on the site measurements.

DR. LAWROSKI: Maybe DOE is doing it, I don't know.

MR. ARSENAULT: I think if the occasion arises when they need our assistance, they'll ask us. The planning is

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still going on. To date we have not been asked to do so.

DR. LAWROSKI: Okay. Thank you.

MR. BARTLETT: Tom Carter mentioned before the technical assistance programs that they currently have underway to support specific decommissioning case work standards has a couple of projects again which relate to decommissioning.

(Slide.)

There is again a technical assistance project here for studying the differences in alternative fuel cycles -- with respect to radioisotope licensing, NMSS again has a few programs here, we searched this one out.

(Slide.)

The same applies to consumer products. Again I point out, though, that the things in those symmetry and health effects that we referenced previously, certainly has some application here.

(Slide.)

Occupational safety. Again the inhalation, the toxicology work which we are doing supports that aspect of radioisotope licensing.

(Slide.)

And we get on to transportation. We are, and we have pointed out, that there is a continuing need in licensing to develop approved structural analysis codes for analyzing the response of these large complex shield and shipping casks, some

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of which have impact limits and other exotic appurtenances to the 10 CFR 71 requirements. A 30 foot drop, the fire, the immersion, the criticality studies that we have during fiscal '79 a reasonable body of structural analysis code development and verification in support of the licensing groups, which have also been asked to initiate what we have called the modal study.

Alex?

MR. GRENDON: May I interrupt? I notice that a lot of these projects, like this one about the puncture of these casks, terminated -- this one terminated June 30th, '79. And we're getting past history rather than the plans for research in the future. Very little of what I've seen involves an ongoing program.

MR. BARTLETT: Again, I think I would have to apologize for that. I thought the scope of this review as the preceeding one was the fiscal '79 research program. Okay?

MR. GRENDON: Some of it ended in '78.

MR. BARTLETT: I don't believe so, and --

MR. GRENDON: The period of work 1/1/78 to 9/30/78, container puncture. Maybe it's a typo error.

MR. BARTLETT: I think it's a typo error, because that program is still going on. We're working with licensed people now to determine whether a continuation of that is indicated or whether sufficient information has already been developed.

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MR. BASSETT: Charlie, I think you ought to point out that the two on that screen and indeed the vast majority of the items discussed thus far, gentlemen, are all ongoing programs. There are few that have been completed.

MR. BARTLETT: Everything that you have in your package, to the best of my knowledge are things that are ongoing right at the present time. Several of these will terminate as a result of what Frank said. This recent million dollar budget cut in our '80 budget we're going to have to juggle things around. But to the best of my knowledge, everything in that pack are things that are being worked on right at the present time.

The modal study again we consider this to be a large complex high priority program which hopefull will develop for the standards group better support for their existing regulations. There have been a lot of questions recently regarding the applicability of the Part 71 requirements for the shipment of a wide variety of materials. And this program is going to attempt to develop the information on which the standards people can decide whether they want to revise 10 CFR 71 with the alternate being to develop mode dependent mode specific transportation regulations. I am sure all of you remember that plutonium air transportable package on which NMSS and we briefed you on almost a year ago. That sort of need engendered this sort of study. We are going to consider the risks, consequences and costs of augmented

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transportation regulations.

Now, Don Nussbaumer, our licensing director, might be able to speak more to the need than I could. That, gentlemen, covers basically --

DR. LAWROSKI: Was that an EDO action reducing it from 4.2 to 3.1 or whatever?

MR. ARSENAULT: No, it was Congressional action in which the various cuts that were applied resulted in four decision units within the Office of Research having to share a larger cut. This was the result of the apportionment.

DR. LAWROSKI: This is fiscal '80?

MR. ARSENAULT: '80.

MR. GRENDON: What I understood you to say earlier was that NRC first made a cut and Congress made a further cut.

MR. ARSENAULT: Our proposal for fiscal '80 was lower than for fiscal '79. In the previous years, Waste Management was included. In '79 was it? No, it was not. Our proposal in '80 was lower than our proposal in '79. The Congressional action resulted in a further reduction.

DR. LAWROSKI: Okay.

MR. BARTLETT: Again, these reductions reflect things like the nonproliferation of alternative studies and the uncertainty, I think, within the Commission. I think work on these alternative fuel cycles ought to be initiated.

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DR. ORTH: Then do we have a specific conclusion that this cut isn't really going to hurt any of the programs that you really think you need.

MR. ARSENAULT: I think that --

DR. LAWROSKI: Unless the moratorium on reprocessing --

MR. ARSENAULT: Well, my own view is that we probably could use some more work in this decision unit than is allowed by the resources made available. I am virtually certain the fuel cycle division would agree with that, but I am going to let them say so themselves.

Again, it's a question of prioritization and how prioritization is carried out in the program. When the resources are reduced, one immediately sets out trying to decide how to formulate the program with a new level of resources. In this case certain programs will be cut out. I am virtually certain that our decision to reduce the criticality studies would be concurred in by the Division of Fuel Cycle, but I could be wrong.

I think if my memory serves, and work has been going on on this during my absence, but if my memory serves, those are the only projects that will actually be terminated. Others will be affected by a reduction in the level of effort, sense of a stretching out of the time for which results will be produced.

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Now, this is a process that keeps taking place in our division and sometimes affects the question of the timeliness of the results.

DR. LAWROSKI: Does the Fuel Cycle Division have any comment?

MR. CARTER: We're concerned about the 20 percent cut. We would like to look at the priorities established. We have initiated staff work between the two divisions to look at the projects that have been prioritized, and we would like to take a harder look. We're concerned that some have been cut, yes, or to get more explicit then there are no clearly identifiable milestones like a time when a certain regulation is supposed to be through or a certain reg guide is supposed to be written, or a certain piece of paper has to come out that this cut will clearly effect right now that you can identify.

MR. ARSENAULT: Yes. I can't answer the question specifically on detail. I can't think of any particular results that were going to be available in time for a regulatory decision to be made. That will no longer be available. As a matter of fact, we haven't yet made our decisions on how to change the program. All Fuel Cycle has is our proposals. We also have to consult with our contractor to find out what some of these impacts will mean to them. So, the answer to your question is I don't think so, because the impacts are not going to be large on any of the more significant

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programs, but I don't know for sure.

DR. PARKER: Frank, is this for your whole division or just specific parts of the division that are taking this cut?

MR. ARSENAULT: The agencies sustained significant cuts as a result of the cuts on the '80 budget. Within the office a number of decisions were taken by Congress, and among these was a reduction of -- let me get my figures squared away -- but a reduction of 25.6 million, which was to be shared among a number of different decision units within the Office of Research.

Some other orthogonal guidance we received resulted in a cut of 10.6 million being shared, as I recall correctly, four decision units. But no further detailed guidance was given us. So, it was an internal decision as to how to apportion that. And for the time being I think it has been done on an almost pro rata --

DR. PARKER: Each decision unit within the Office of Research.

MR. ARSENAULT: I think what we did with those final four decision units, because there didn't seem to be any basis for prioritizing among them in any significant way, we simply pro rated the ten across those four to find out what the reaction would be, and that resulted in this decision unit, sustaining a reduction of 800,000, I believe it was to 3.2

DR. FOSTER: Of course, those portions of work that

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we've been hearing about here under the technical assistance type of arrangement for NMSS are not affected by the budget cuts.

MR. ARSENAULT: Yes, they will be. The reductions in the full cycle budget mean that unless our prioritization effort indicates that we must kill some of the ongoing ones in favor of new work, we will have no new programs, and, in fact, will be stretching out, will be diminishing the level of effort in ongoing programs.

Now, it is quite possible that in the course of our review of Fuel Cycle, because we did have some new requirements identified, in the course of our review with the Division of Fuel Cycle we may well decide that some of the new requirements are of higher priority than the continuation of the ongoing project.

If that is true, then we will formulate these new projects to the old ones and take appropriate action during the course of the coming fiscal year to reflect that change.

DR. FOSTER: The aspect that I had in mind here was that those programs that were funded directly by NMSS contrasted with flowing through research.

MR. CARTER: We received a 30 percent cut in our programs also. That has been reflected here.

DR. FOSTER: That's the information that I was looking for.

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DR. LAWROSKI: Can you tell us where, Mr. Carter, where you were hurt the most by these cuts? I know you haven't completed your work, but could you give us a hint?

MR. CARTER: In the budget cycle we felt we were done to a bare bones technical assistance program to start with. The estimates on the NFS tanks at West Valley has doubled from what we thought it would be, and our cut on top of that, we feel that we are having to delay significant programs such as the analysis of the NFS tanks and the decommissioning work also. It was pretty much across the board.

MR. BASSETT: There's one minor point that I'd like to clarify. Research funds are separately appropriated. They do not flow through from our user office. They are separately appropriated. It's our problem that the Congress --

DR. STEINDLER: A fair number of the projects that are discussed here are generically covered under occupational safety, and a number of other divisions in DOE as well as references that have already been made to other Federal agencies that do work in these areas. To what extent is that important in your inability to fund long range projects? To what extent do you believe that you can transfer interest in obtaining data of long range interests to you, transfer that interest to DOE and to urge them successfully to initiate programs along those lines.

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And secondly, to what extent can your inability in fiscal '80 because of budget cut, be supplemented by some urging on your part to DOE to obtain data?

MR. ARSENAULT: I think in this specific area that you refer to, occupational protection, most of our projects are not long range projects, they are focused on rather specific shorter term needs that arise out of the regulatory process. I believe the overall question of occupational health and safety and radiation protection -- or, rather radiation health effects -- is being adequately covered, with some reservations is being adequately covered in the overall programs of the Government.

I am sure you're familiar with the reasoned emphasis that's been given to this and the charges by both the White House and Congress to HEW and EPA in concert with NRC, to give attention to this question of health effects from radiation.

So, I think the long term research programs are being conducted by other agencies, and in my view are reasonably comprehensive and adequate. I don't think we can transfer the specific interests that are evident in our research program to these other agencies. At least my experience would lead me to believe that we can --

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DR. STEINDLER: Specifically, DOE and the AEC before it have done filter studies, as I mentioned to Charlie, for 25 years. Those programs to some extent are still going on. I believe Occupational Health and Safety, the Division of DOE, also has a respirator study effort that's been ongoing and, in fact, recently resulted in some significant manual changes that impinge on all the contractors.

I guess what I'm saying is that there's an ongoing set of programs that, if they do not duplicate, certainly parallel your interests.

To what extent have you been able to convince, as we talked about yesterday coming into the hearing on waste management, convince DOE to pick up research whose ouput would be of use, direct use, in licensing activities -- not necessarily occupational safety?

MR. ARSENAULT: I could give you a simple answer and thereby obscure a fact. The simple answer is that by and large we have not been terribly successful in getting DOE to pick up work that we want done if they haven't already identified it as of interest to them.

In some areas, we've gotten them to modify or adjust programs to reflect our interests, but as I say, that's a simple answer.

But there's another part to it, and that is to

what degree are we coordinating in depth between our program and DOE. I've made the point on a number of previous occasions that we do some, enough to keep ourselves out of trouble, but not enough to effect the synergies and efficiencies that I think are desirable.

DR. LAWROSKI: Isn't it true that from time to time members of Congress occasionally express at least opinions to the effect that they would caution against a certain amount of in depth information?

MR. ARSENAULT: Probably a conflict of interest arises, but there are many areas where it doesn't, or it is at least thin enough for us to take advantage of it.

Let me point out that the decision unit structure of our program is not directly related to organizational structure, but I think it's enough to point out that we have one branch which is responsible for assistance performance, and they look at effluent control systems, the filter systems that we're talking about, and this is a two man branch. I've been here a number of times before. You know how I feel about the relationship between our program size and the dollars we are given to manage and the staff that is doing the managing.

So we do our best in coordinating with DOE. We can do better, even with our current resources, and we plan to. But the full degree of coordination that is employed by

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the guidance we get simply isn't possible if we're going to manage the program as well.

DR. STEINDLER: Is the fact that a number of the people we've heard from in the last day and a half have been in their particular jobs for relatively short periods of time a difficulty which impinges on this ability to form solid personal contacts with the people in DOE?

MR. ARSENAULT: Clearly when someone first comes in, they're feeling their way around, but I don't think it's a very long lasting effect. It speeds things up if someone knows something about DOE programs and organizations, but that's a relatively short-term impact. I don't think it has a major effect. It's sheer numbers.

DR. LAWROSKI: Just the numbers of people, you don't have enough to be able to devote enough time to really get well familiar with what is going on.

MR. ARSENAULT: I would point out that we're a small division, yet we have the responsibilities of a division, so we do spend a disproportionately large fraction of our time on matters that I would regard as peripheral to the technical matters of our research.

DR. LAWROSKI: The ACRS noted that in it's 1977 report to Congress.

MR. ARSENAULT: These are the facts of life, and we live with them.

DR. ORTH: I hate to keep on beating the question of specificis, but we really want to be sure that the work that needs to be done gets done. That's our real goal here. That's why we keep worrying about identifying things that other people could do. It's not that we're trying to criticize. It's just that we're trying to find a way to get the things that need to be done done.

Now beating a little bit more on the air cleaning bit, in general, which we've already talked about too long — maybe too long — it was after all the DOE, AEC, or whoever who developed things like the new plutonium criteria and laid upon all their contractors the requirements that you really operate to keep everything inside under almost any conceivable conditions. They predate that depth of interest by the NRC considerably.

So if programs can be identified, and you can go to DOE and say, "Hey, you really know that you're not going to meet your own criteria," I don't think there will be any problem in trying to get them interested. I think all you have to do is point out gaps in the things they are laying on their contractors right now in terms of meeting their own criteria.

So I just wanted to give that thought.

DR. LAWROSKI: Go ahead and respond, after which, Frank, we're going to have a break.

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MR. ARSENAULT: In general, you're exactly right, and I agree with you. However, in many cases, it is the public nature of the NRC's activities that causes us to question assumptions and to challenge assertions. That is not present at DOE, and DOE has a large number of interests which it must serve by its limited resources as well.

So when we have an interest that is not shared by them, they're sometimes reluctant to devote their resources to both, though by and large we get good cooperation from them in those operations where we share interests. But there are these areas where the budgeting cycle also is two years, you know, and they budget and plan two years in advance. We come along in July and want answers in December, and they say, "We'd be happy to deal with you or put it in our '85 budget" or whatever. So that's another problem -- the question of the budget cycle versus the management problems.

DR. LAWROSKI: We will have a recess until, we'll make it five after eleven.

(Brief recess)

DR. LAWROSKI: While we're waiting for the DOE people to arrive, I would like to ask, in addition to the comments we will discuss later today orally from you, but each of the consultants -- hopefully by next week I want a report of your impressions of the last two days on what

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you've heard about the research program. Please send it to Mr. Muller or Peter Tam, either one. It does not have to be a long report, but as well as you can thus far discern whether you think they are putting adequate priorities or inadequate.

I do plan to have another meeting with you, because we hope by that time we can hear from Frank his priorities on waste management.

Is October 25 a good meeting time?

DR. PHILBRICK: What's that, a Thursday?

DR. LAWROSKI: Is it a Thursday?

MR. CROMER: Yes, it is.

DR. LAWROSKI: Yes, the 25th is a Thursday. I think a one-day meeting should suffice. We'll devote it entirely to the matter of priorities.

Frank has some comments he wishes to make to correct some earlier statements and amplify on them.

MR. ARSENAULT: Thank you. I'll do that as well.

With regard to the October 25 meeting, following my comment yesterday that I could produce a unilaterally prioritized picture of the waste management program, Bob committed to me to do his utmost to expedite their activities in that connection. I feel that by October 25, we certainly should be able to present a picture which would reflect the priorities of that program, and I'll send to the

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Subcommittee anything I can in the interim.

DR. LAWROSKI: Very good.

MR. ARSENAULT: Also, we've already mentioned that in connection with fuel cycle, we are currently engaged in that review. That, I would expect to be done within a week to ten days.

The other point that the Chairman has given me the opportunity to correct something that I said during the presentation this morning, when I indicated that our request for funds in '80 was lower than our request in '79, part of my confusion resulted from the continual restructuring that our program goes through. I've done a little review.

Our request for '79 was at about $4 million, just [illegible]ade under, and our request for '80 was at that same [illegible]l, and in fact some funds were transferred out of our '79 program so that the money actually spent in the fuel cycle decision unit was at about $3.2 million which is the same level as the Congress has allowed us in '80. So, in fact, both the request and the actual were comparable between those two years.

DR. LAWROSKI: Mary?

DR. STEINDLER: You indicated, Steve, that in our written comments regarding this meeting, you wanted us to address the question where is the research program inadequate in the sense of organizing it and setting goals

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and priorities.

DR. LAWROSKI: I understand that's in the absence of having heard from them in some areas.

DR. STEINDLER: Might I reflect back on the comment that I made earlier and be a little more blunt, perhaps. My view of the research function of NRC is strictly a service to the licensing function. And as a service organization, I then now view its charter to be determined almost entirely by the needs of the licensing people.

We can assess, because of the structure of these last two days worth of hearings, we can assess what has been identified by the licensing people as a set of problems.

DR. LAWROSKI: Well, there are other uses besides licensing.

DR. STEINDLER: Well, let me take that up a little later. But as we noted this morning, for example, there was a list of technical issues presented by Mr. Carter, whose relative importance to doing his job, whatever that may turn out to be, were not identified by him.

Hence, we don't really have from the customer of any of the research output a notion of what's important to them and what isn't. Therefore, I would find that in the absence of some additional information, a kind of trial and error process to assign priorities on what research ought

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to be done. That is not done, et cetera.

And that's exactly the same kind of problem that Frank Arsenault is going to have when he comes back to us.

DR. LAWROSKI: I assume, you know, that he continually talks with some of these people, so that he has a pretty good idea.

DR. STEINDLER: In his case, he's got it easy, because he can go back and talk with these people quickly. I think in our case, I think we have a much more difficult time of assessing what is actually needed by the licensing function. On the question of whether or not research has a use beyond the licensing function of NRC, my perception is no. I view it in a very limited sort of way as a service. Other people may view it differently.

MR. GRENDON: How does Frank Arsenault view it. Are you content with what his definition of what your funcion is?

DR. LAWROSKI: I hope it's not quite that narrow.

MR. ARSENAULT: In a way I am content with i . But your question gives me an opportunity to make what I regard as an extremely important point.

In the research programs in the Office of Nuclear Regulatory Research should respond to the needs of the agencies — essentially all of these are related ultimately to the licensing process.

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But there's a difference in the character, the responsiveness, and the service we provide to these offices has to be interpreted in a specific way.

If I may, I'd like to explain this by describing a conversation I had with one of the people in the licensing office in which it was pointed out that technical assistance contracts are managed in a way very different from those in the research program. They are managed with extremely tight control over product, because it is the product which is the tool of the licensing people, and they have solicited outside epertise to help them produce that product.

In the research program, we seek to achieve a much higher degree of independence on the part of the contractors with regard to the contents of their work and their product. We do constrain them within the narrow bounds of our specific needs and interests, but the degree of independence that we seek to provide to our contractors, independence of thought is much greater than that of the technical assistance program.

And thus, when you refer to us as a service organization, I accept that label, but it has to be interpreted in this very specific way. It is not a service that is equivalent to the service provided by technical assistance contracts. It's very, very different.

MR. GRENDON: Well, let me ask one further

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question. There are issues that arise because of the public view on nuclear energy, public concern about various aspects, that don't come directly through licensing but NRC is aware of the fact that the public thinks something's wrong here or thinks something ought to be done there. Do you attack any of these problems in terms of any contributions that research can make to answering the public's concern?

MR. ARSENAULT: The answer is yes. I think the clearest way of answering that question is, we accept the ACRS recommendations in fact as user statements, so that we do respond to recommendations by the ACRS, sometimes not as quickly as the ACRS would like, but we do respond to them, even in the absence of the same issues that have been identified by licensing.

We also try to incorporate in our program issues that we see are of interest to the Congress and to the public. But occasionally the user request process has gotten in our way.

MR. GRENDON: The thorium cycle was one of those which Congressman Udall, somebody said, was concerned about, how that would affect regulation of the fuel cycle facility.

MR. ARSENAULT: This is one area, I might point out, that some of the licensing offices have responded to,

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and we're beginning to hear from them now concerning what they think might be appropriate research in these areas.

DR. LAWROSKI: I made a distinction between the licensing people and the licensing process when I made my comment. Standards, for example, is a part of the licensing process but not necessarily the same people.

Can it hold, because the DOE people have arrived, and I'd like to make certain that they have enough time. We can continue this executive session later.

DR. ORTH: It was a question --

DR. LAWROSKI: Is it a short question or a lot of comments?

DR. ORTH: No. It's just a very short question.

DR. LAWROSKI: Okay. Go ahead.

DR. ORTH: What kind of a split on research projects are you getting between ones where you are formulating the program and going out and asking or soliciting proposals or where you're just sitting back and waiting for people to make proposals and then deciding whether you want them? What kind of split in your research budget is going in those two directions?

MR. ARSENAULT: I think essentially all. To give you a number, it's 90 percent of the projects that we ultimately sponsor are a result of our having identified the need and the requirement. A very small fraction is an idea

mgcDAV somebody has generated outside.

DR. ORTH: Thank you.

DR. LAWROSKI: Okay.

Which one of you, Mr. Klein or Mr. Beckett? It's going to be Mr. Beckett. You're already up there. You're ahead of me.

This is Mr. Beckett from the Department of Energy.

MR. BECKETT: Thank you, Dr. Lawroski.

DR. LAWROSKI: Please go ahead with your presentation.

MR. BECKETT: I'm Gene Beckett. My job in DOE, I'm called WIPP Project Leader, so I'm going to start out our discussion with a very short update on where the WIPP stands, which as you know is the project that has the most controversy, and it's the furthest along towards actually doing any personal isolation of waste.

When I am through Keith Klein, who is in the Division of Waste Isolation, is going to cover bascially the long-term program for high level waste, plus I believe some information on remedial action.

DR. LAWROSKI: By way of courtesy, Mr. Beckett, let me introduce the people from the ACRS Committee, the staff, and its consultants.

On my left is Mr. Jeremiah Ray, a member of the Subcommittee and a member of ACRS.

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Beginning on his left are a number of consultants to the Committee: Mr. Sylvan Cromer, Dr. Schyler Philbrick, Dr. Frank Parker, Dr. Richard Foster, Mr. Alex Grendon, Dr. Martin Steindler, and Dr. Donald Orth and, I think you probably know Mr. Ragnwald, Muller, and Peter Tam, who are members of the ACRS staff.

MR. BECKETT: I've had the pleasure, if I can put that in quotation marks, to appear before the Committee on other occasions.

(Laughter.)

MR. BECKETT: Some years ago as a member of the reg staff and then later on representing the applicant, which Mr. Muller may recall -- I believe you were on our subcommittee, Dr. Lawroski, on Callaway, Wolf Creek, et cetera.

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Maybe that's why I find myself in waste management Of the five Snupps plants, we're only going to build two and waste management is certainly a factor in Wisconsin and New York.

So let me talk just a little bit about WIPP. I believe in your meeting at Hanford you got a pretty good technical briefing, so I'm going to confine myself generally to status and perhaps institutional problems.

(Slide.)

These, I think, are the principal issues on WIPP, not too many of them technical. The mission, which we'll discuss very quickly, whether or not the facility is to be licensed, public acceptance. And if any of you have been in New Mexico lately, you know that the bumper stickers are out, both pro WIPP and anti WIPP.

This is not an academic problem in New Mexico. It's probably one of the chief political issues in the state. You won't be able to pick up any New Mexican newspaper for more than two days in a row and not find a front page headline on WIPP.

Either DOE is accused of changing direction or some political figure takes a position.

The other issue is state concurrence, which we'll discuss towards the end of the talk. The issue of resources, the hydrocarbon and potash resources at the site. And

finally, in a review of EIS, I would say that of all the issues which have had the most public agency and state comment, it's been the issue of transportation.

Real quickly, I'll just remind you what the mission of WIPP is.

(Slide.)

This lists the various kinds of nuclear waste, which, of course, comes from both defense and commercial programs. The prime mission of WIPP is to provide for current isolation of the defense transuranic waste.

The objectives of the program -- I've included this in your packet just for general information.

(Slide.)

This tells you the volumes and locations of the defense transuranic wastes, both that which is buried prior to 1970, and that which is called stored, which means that it's retrievable waste, which is above ground on asphalt pads.

(Slide.)

The WIPP objectives originally were permanent disposal of defense TRU, capability for high level waste experimentation in bedded salt, and in early 1978, the Department of Energy recommended that the mission be expanded to include a demonstration of permanent disposal of up to a thousand spent fuel assemblies.

MR. GRENDON: May I interrupt a moment?

When you come to abbreviations, I'm not familiar with most of them. CH waste, RH waste?

MR. BECKETT: Okay, contact handled. That means that it can be handled with a fork lift. The surface radiation is so low that there are no special precautions. Remote handling would involve handling through a cask for hot stuff.

MR. GRENDON: I'd also like to know what SNUPPS stands for.

MR. BECKETT: SNUPPS is Standardized Nuclear Unit Power Plant System. This was a standardized design.

I don't know how I got to SNUPPS to WIPP.

DR. LAWROSKI: You earlier remarked about your involvement with SNUPPS.

MR. BECKETT: I don't know how I got in with such an acronym.

DR. PARKER: What is Pantex?

MR. BECKETT: That's one of the processing plants.

Keith, do you know where Pantex is?

DR. LAWROSKI: It's in Amarillo, isn't it?

MR. KLEIN: I thought it was in Rocky Flats.

DR. LAWROSKI: I think it's in Texas.

MR. BECKETT: Well, the department also recommended that the facility be licensed. So there were two major changes: Addition of the spent fuel; and licensing.

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The interagency review group also recommended this position, the basic position being if we're going to spend this much money on the facility, it doesn't take too much more to add this mission to give the institutional experience of licensing, among other things.

The department also recommended that even if we did not have the spent fuel demonstration, that the facility be licensed for the long-term disposal of true waste, because after a relatively short period of a few hundred years, high level waste and true waste have pretty much the same characteristics.

So the reason was if you're going to license high level waste, you ought to license true waste. Of course, current law does not provide for that.

The Congress, particularly the Armed Services Committee, which sponsored this project, which is a defense project, were not too happy with either licensing or the spent fuel demonstration, and in the '79 budget did not permit us to spend funds towards those missions.

In the current work on the '80 budget, the House cancelled the project. The Senate provided funds for the project with the restrictions of no licensing and no spent fuel.

Based on this adamant position of Congress, Dr. Deutsch in July told the House Armed Services Committee that

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although the department continued to recommend licensing of the facility and the spent fuel demonstration, they would no longer continue to push that recommendation and we would continue the project as authorized by Congress.

Therefore -- the slash there -- and we are continuing it as an unlicensed defense facility.

(Slide.)

Just to remind you from the last time, WIPP's site is in Southeast, New Mexico, about 25 miles to the east of Carlsbad. I believe Wendell Wirth probably gave you a good discussion of the initial general site selection, then the exploration, the discovery of certain features such as faulting near the Capitan Reef which caused them to move their investigation away from the Capitan Reef, the attempt to avoid the potash resources as far as possible.

(Slide.)

And just maybe a reminder, the site is divided into four zones. The first zone is simply the fenced area of surface facilities, the second zone encompassing the area of underground development, and zones three and four area buffers.

The rules for activity within the zones --

(Slide.)

For your reference, in the group of slides, this indicates the type of activities that we would permit. As I

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said, resources are an issue. But we believe that almost all of the potash can be eventually recovered if the activities controlled with such things as no solution mining appear not to breach the repository area.

The oil and gas is about 15,000 feet deep. The storage horizons here are about 2600 feet deep. So we believe that we have not ultimately denied the hydrocarbon resources by later use of directional drilling.

(Slide.)

The facility is rather simple. It's not a reactor. It's a materials handling facility on top of what looks like almost any potash mine in that area.

The current design has four shafts and contemplates two levels -- one for the contact handled true waste, lower for the remote handled true waste, and the experimental facility.

By the way, the experimental waste would all be removed prior to repository closure. We're not planning for ultimate disposal of high level waste, only an experiment.

So all experiments would be designed to be removed.

(Slide.)

I've left in the packet a little layout of the surface facilities or waste handling building which handles both the contact handled waste, which would come in 55-gallon drums or plywood boxes. It has a hot cell to affect transfer

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from a carrier carrying cask into the cask, which is used to handle the materials.

Yes, sir.

MR. GRENDON: I'm not sure that I understood you correctly. Did I understand you to say that after you conducted the experiments in WIPP, you remove everything and close it up as a totally inert area?

MR. BECKETT: No. The high level waste — there are two missions, you recall: Disposal of TRU waste and after an initial period of retrievability, the intent is to leave it.

This will be high level waste experimental facility. For example, one might take solidified defense wastes and put them in, say, an accelerated kind of a failure mode and evaluate that and then maybe come in later and core out the whole experiment.

But the intent was no high level wastes were to remain in the depository on closure.

MR. CROMER: Can I ask what this high level failure mode would be?

In other words, how will you accelerate the test.

MR. BECKETT: The experiments are in plant, but there might be, for example, instead of putting it in a canister, one might not have the canister. So that one could evaluate the effects after the canister. Or one may have a canister

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and mayoe introduce some brine or something which would not normally be expected to be there in order to evaluate it. Or one may use a higher thermal loading than would be planned.

MR. GRENDON: These are merely concepts that you are thinking of. There are no actual plans presently.

MR. BECKETT: It's part of the Sandia mission to develop an experimental program. But we don't have an experimental program. We are looking at the design of the facility to make sure that we're not precluding the bounds of experiments that might be useful.

Did that answer your question?

MR. CROMER: Yes, it did. Thank you.

MR. BECKETT: I believe the subcommittee has the draft environmental statement available to them. And I'm not going to go over that. I just want to remind —

DR. LAWROSKI: That's the two volumes.

MR. BECKETT: That's the two volumes. Various operational accidents were evaluated which — the worst being the drop of the cask down the main shaft with the spent fuel element.

In the final sense, that mission is gone. It would probably be a high level waste experiment of some sort that produced very minor consequences.

In the long term, we've evaluated really four long term breaching scenarios.

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(Slide.)

Three of which have to do with ground water. And I'm just reminding you of the geology. Basically, you have a very thick evaporite section with some later sedimentary rocks on top and other —

These are sandstones that go on down finally to the basement. There is an aquifer here and there is also an aquifer below the repository.

So, therefore, with some imagination, one could postulate events in which we might have communication of the aquifer, one or more of the aquifers with the storage level.

The bounding event of that sort is illustrated here.

(Slide.)

These are all in the EIS. That assumes that at some point in time, the knowledge of the repository is lost. However, someone has retained the technology of drilling 15,000 feet for those hydrocarbons and comes through and penetrates the upper aquifer of the lower repository, the lower aquifer setting up a flow through the repository.

In the analysis in EIS, it was assumed that the container was not there and that that wastes dissolved at the same rate as the salt.

Then studies were done of transport up to this aquifer and then down to Malaga Bend, which is the Pecos River.

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I don't remember the numbers of the doses, but they are all very, very small amounts.

Another accident was that same drilling. But the geologist who is smart enough to drill 15,000 feet isn't smart enough to know about possible nuclear waste or radiation. He examines the core of the spent fuel area for half an hour and in 100 years, he takes a pretty significant does — I think 90 rem. In 250, it's down to, I think, about 3-1/2 rem.

And further, the effects of someone living near the mudhole that this was later thrown into for essentially a lifetime, drinking water and food and so forth, that becomes a very small dose.

Of course, with the change of the mission, we'll have to re-evaluate. We won't have probably quite as severe an accident. With only the TRU waste, there would be very little dose.

Organization-wise --

(Slide.)

— this is a decentralized project. We have a project in the Albuquerque operations office. We're getting administrative support from the operations office, technical direction and program direction from the Office of Nuclear Waste Management.

Three principal contractors — Sandia for the

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environmental work, site characterization and R&D activity; Westinghouse is a support contractor, generally, filling the role of an operating contractor.

Yes, sir?

MR. GRENDON: Our diagram differs from your slide in that the line from Office of Nuclear Waste Management to Office of Work Project Management is dotted. Does that mean some attenuation of the connection?

MR. BECKETT: No, that means the girl copied the wrong slides. This is the way that it should be, so draw it in. My boss got mad at me when he saw the dotted line.

Westinghouse does such things as look at how this thing would be operated and factors the considerations of an operating contractor into the design.

Bechtel serves the traditional architect/engineer role. We finished Title I design. We're finishing up the reports. The capital cost estimate is about $440 million. We'll be issuing a preliminary safety analysis report at the end of September.

A couple other things of interest. We fund work by USGA for much of the geological exploration. I'm sure that you heard about that in Hanford. And we also fund two activities in the State of New Mexico.

EEG means Environmental Evaluation Group, and they are doing an independent radiological safety evaluation. I

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would say that they're sort of like a mini-state reg staff, if I can so call them.

We're also funding in cooperation with New Mexico a study by the University of New Mexico on socio-economic impacts.

I also point out, Dr. Parker, as you recognize, we have a National Academy of Sciences panel on WIPP, who have been quite active. And one of the things that I'd like to report to you today is a letter signed by Dr. Parker. So maybe he's already reported, which tells us basically, you guys have been mucking around on the surface long enough. You're getting to the point of diminishing returns and we strongly recommend that you dig an exploratory shaft down to get some in situ measurements of the salt at the storage horizon.

We appreciate that letter very much and I hope that we can implement your recommendation.

In the issues, let me talk about the state and consultation and concurrence.

DR. STEINDLER: Could I interject a quick question? You indicated that by the end of September, you're going to turn out a PSAR. Why?

MR. BECKETT: Because PSARs are prepared by the Department of Energy for unlicensed facilities for review, peer group review within the agency and possible use by outside

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people.

So PSARs are made for DOE reactors, whether or not they're licensed.

So it's a necessary step, in any event.

One of the bit controversies, of course, is can a state -- does the state have the right to stop work on a waste repository?

I'm not a constitutional lawyer and I think you'd probably find that that's a very difficult constitutional question. However, the department has taken a policy position rather than a legal position that it will not do work in a state without the concurrence of state officials.

I think that's not only a policy matter, but a matter of practicality.

In today's environment, New Mexico, I think, is a very forward looking state in that they have not taken a position on WIPP and have kept, I think, an open mind. And they have also looked ahead as to how they might work with DOE to implement the policy of what we call consultation and concurrence.

(Slide.)

As a result, the State of New Mexico has got quite an organization for interfacing with DOE. It really came about in two stages. In the early administration of Governor King, he appointed, I believe, at that time an advisory committee on WIPP, which reports to him and is also associated with a committee of long standing, this committee on technical excellence, which includes national laboratory heads and university people.

This is a special advisory committee. Professor Wilkening is the chairman. And they provide advice in a more or less conventional way.

Also, earlier than in the very recent past, this environmental evaluation group was set up in the Department of Health and Environment, and they are staffed with competent scientists. Dr. Neal is the director and they are developing--basically, they are in a methods developing mode, although they have provided extensive comments on the EIS.

This spring the legislature passed an act, the Radioactive Wastes Consultation Act, and created two bodies: a task force which is comprised of the heads of these three departments, which is responsible for interfacing with the Federal Government on the issue of WIPP, particularly what do we mean and how do we implement the consultation and concurrence.

In the legislature, appointed by the legislative council, which is sort of a committee of both houses, is a consultation committee, four state senators, four state representatives, and they are charged with oversight of the interface with the Federal Government. They are becoming quite active.

The task force has had a meeting, I believe, two weeks ago. The legislative committee, consultation committee, is holding a hearing tomorrow in Santa Fe. Sheldon Myers will be testifying before them. And they're zeroing in on what do we mean by consultation and concurrence. I think they understand what we mean by consultation; concurrence is going to take some sharper definition.

And I point out a serious problem, in that the Armed Services Committees, particularly of the House, are a little leery about the state having what may look like a veto authority over a defense facility. So we walk here on new ground and with a very delicate situation.

I put Texas in the barbed wire. WIPP is closer to much of Texas than much of New Mexico. We have had contact with the attorney general and the Texas energy advisory council, which advises the governor on energy policy. But we of course do not have the infrastructure that New Mexico has set up.

(Slide.)

I added one more slide. This is more for a Sandia

briefing when you are out in that area again.

Some of the technical issues that are being addressed in the R&D program: true degradation and gas generation; how much gas are we going to have generated. And that influences how many gas-generating materials we can tolerate in the wastes. It directly influences the waste acceptance criteria. Work on rock response summarized there. And looking towards the future sealing of the repository.

DR. LAWROSKI: What's the nearest distance to Mexico?

MR. BECKETT: Let me see. Not too far. I'll have to find a map. But you've got the little skinny part of Texas there right underneath New Mexico. I would say it's less than a hundred miles.

DR. LAWROSKI: Are they involved in any way, like Texas?

MR. BECKETT: Mexico, to my knowledge, has not been involved directly. I might point out, I've mentioned the bumper stickers, and this project is like a lightning rod or a lodestone, which attracts all the people who have injuries or concerns with social evils. And so when we get to the hearings, discrimination against Chicanos, discrimination against Indians, all of these issues, the problems of the state government and their relationships with each other -- all of these issues come to the hearings.

So as I say, the project is an interesting and active one.

MR. GRENDON: Is there an Indian reservation anywhere near this site?

MR. BECKETT: To my knowledge, not within 40 miles. I believe you get over into the mountains to the west, around Las Cruces, and in that general area.

I'm sorry I spent longer than I meant to. But Keith said he wanted a little time to get ready because he got into this just at the last minute. Keith will cover some of the rest of the program.

Thank you for your attention.

DR. LAWROSKI: You don't expect the aquifers that might get involved in the event of an accident, that it would affect the supplies of water in New Mexico?

MR. BECKETT: No. We get down into Texas, and therefore the people in Texas around Odessa, the League of Women Voters are very concerned with the aquifer. And one postulates eventual travel to the aquifer. But we're talking with the times and distances to really bring it down to an almost infinitesimal number.

DR. PARKER: It's extremely low permeability.

DR. STEINDLER: Could I ask -- you may have mentioned the funding or the budget situation. Perhaps either I missed it or I wasn't paying attention. How did you fare for

fiscal '80 in the budget situation?

MR. BECKETT: Okay. Congress has not passed the fiscal '80 budget. We were authorized zero in the House and we were authorized funding to continue, not at the rate that we had requested, but at a reduced rate. In a conference, money was provided, but only for the first six months of the year, because the two issues of licensing and state concurrence -- the Committees wanted to maintain a tight rein, to take another look halfway through the year to see whether those problems are on their way to solution.

DR. STEINDLER: Are you able to operate on this kind of a six months basis without seriously impairing your time schedule?

MR. BECKETT: I think we have ways. We now would plan to start construction in '81 and complete -- start limited operations in '86. With the current funding, there are ways to get around that.

More serious, however, is the NEPA process, and the comment period on the draft statement closed on September 6th. We're restricted on the amount of final design work that we can do until the final statement is out. The NEPA process is impacting more seriously right now than the funding process.

DR. LAWROSKI: What is your position within DOE?

MR. BECKETT: I am called the WIPP project leader.

report to Sheldon Myers, who is director of the Office, the program director of the Office.

DR. LAWROSKI: You report directly to Myers?

MR. BECKETT: Yes, sir.

DR. LAWROSKI: No one in between?

MR. BECKETT: No. There are a lot of people around.

(Laughter.)

DR. LAWROSKI: That I expected.

How about you, Mr. Klein?

MR. KLEIN: Keith Klein. I'm with the Division of Waste Isolation. As you probably remember, there are several divisions in the Office of Nuclear Waste Management: the Division of Waste Products, Transportation, Waste Isolation, primarily responsible for the long-term disposals, siting, the technology development and design, construction and licensing of the facilities.

And there are some projects, such as the WIPP project which Gene heads up, in an Administration Division, and a couple smaller divisions.

DR. LAWROSKI: To whom does Myers report?

MR. BECKETT: To the Assistant Secretary for Energy Technology, who is now Charlie Williams, who is Acting Assistant Secretary. John Deutsch had that job before he was promoted to Under Secretary.

DR. LAWROSKI: Go ahead, Mr. Klein.

MR. KLEIN: Putting together this presentation --

DR. LAWROSKI: Or is it Dr. Klein?

MR. KLEIN: Mr. Klein, Keith.

Circumstances beyond our control have kind of resulted in a unique circumstance of my boss putting together this presentation for me. I feel confident that all the substantial content is here. But I think I have to give him a few lessons in organization.

(Laughter.)

MR. KLEIN: I would also mention --

DR. LAWROSKI: But he lets you do it.

(Laughter.)

DR. LAWROSKI: Being a product of the mass media generation, one of my primary concerns is whether or not my deodorant is holding up.

What we've done is highlighted --

(Slide.)

-- what we consider the major accomplishments that have occurred under the auspices of the Office of Nuclear Waste Management since your meeting out in Hanford in April. I'll try to pull out the most significant of those, and I will basically use these as talking points, and be coming back to this particular viewgraph.

Most significantly, the generic environmental impact statement on the management of commercially generated

high-level waste has been issued in draft form. It covers ten different alternative strategies for waste disposal, ranging from a seabed to ice sheet, space disposal and deep hole and deep geologic and mine repositories. It compares and evaluates environmental impacts of the different approaches and supports the DOE proposal to continue emphasizing the deep geologic disposal as the primary concept for ultimate waste disposal.

It also embraces the recommendations of the IRG report, which have been integrated into the program and which we are pursuing.

There have been hearings in Washington, D.C., and in Chicago on the draft statement. Hearings are planned, coming up fairly soon in Atlanta and San Francisco and Dallas, Texas.

I might add that participation at the first couple meetings has not been all that fantastic. There have been some interesting comments, but it seems as if we have to improve our efforts at advertising these hearings. And we have done that. For the Atlanta hearing, over 5,000 flyers have been sent out. There have been radio spots produced as public service announcements, and also TV spots, I believe. We've also generated some summary documents which really distill down the gist of the environmental impact statement to a manageable few pages, and multiple copies of this are

being made available.

So hopefully this will stimulate more public input into the decisionmaking process, so we can have an even stronger basis for proceeding with deep geologic disposal and have that settled.

MR. GRENDON: Where and how do you distribute these things? In the San Francisco area, for example, I wasn't aware of these hearings.

MR. KLEIN: The San Francisco hearings haven't taken place yet.

MR. GRENDON: No, but you're trying to advertise them. How do you advertise them?

MR. KLEIN: Newspaper ads are one thing. I don't know if they've come out yet or not.

They have come out, someone's nodding back there. They have been produced.

The regional representative of the office, being out there and most familiar with local concerns and regional politics, are really handling the advertisement of these hearings. But basically, it's the newspaper ads. TV spots are being produced and radio spots and these flyers.

DR. LAWROSKI: In Atlanta, you could have been promised a much bigger audience had it been located in Stone Mountain, for example.

MR. KLEIN: We'll take that into consideration.

The meetings -- the hearings haven't been held yet. But it may not be too late to consider that.

The second item I want to touch upon is the continued and expanded field exploration --

(Slide.)

-- in states of interest. You've probably all seen this viewgraph before. Shown are the four salt formations which have historically been of interest, and also the Nevada test site and Hanford Reservation. This particular viewgraph overlays those formations with the locations of reactors.

I have to caveat this by pointing out that all of our activities in the Salina Basin are on hold due to lack of agreement with the state on how we can proceed with those. But we have made considerable progress in the Paradox, Permian, and the Gulf Coast salt dome areas.

DR. PHILBRICK: Are you on hold on Ohio, too?

MR. KLEIN: New York and Ohio, too.

MR. BASSETT: Michigan?

MR. KLEIN: Especially Michigan. We never really got too far off the ground in Michigan. That was one of the first states we were interested in, and had difficulties there. But there is some encouraging development there and potential for some future work there, as in a number of other states, which I'll get into a little bit later.

But of course, the four salt dome regions are not on DOE land, and so that I think makes it a good point for illustrating how our efforts at involving the public and the state officials and the state institutions have been successful and are really very encouraging. Really, if you came to me personally and asked me, what are the ten most significant accomplishments in the DOE waste management program, I would tell you about ten specific bore holes that have been bored outside the DOE reservations. Each one of those really represents a considerable accomplishment.

First of all, any field activities, we proceed by first discussing our intentions or desires with the state officials, oftentimes starting with the governor. From there, it filters down to the state level officials; and from there it often goes to public hearings or meetings in the areas in which we want to conduct the field studies. Couple that with the number of permits and regulations, state regulations and rules which have some bearing on where we can conduct our activities and how, and considering the public apprehensions, then it really involves quite an amount of spadework in explaining just what it is exactly that we want to do and how we intend to do it.

In the case of Mississippi, we have presented a plan of work to the state which outlines what we'd like to do in the next year, and it has been signed by a select

governor's committee, which has been by executive order appointed to work with us in working out how we can proceed. And it's very comforting to have that sort of paper, which both from our perspective and the state's perspective shows where we're going and outlines how we're going to get there.

I'd also say that we are involving state institutions of higher learning and state agencies in the conduct and evaluation of these activities, and that has also been most helpful, because the state involvement, the state agencies -- DOE credibility is not at an all-time high, so having state universities and state agencies actually involved in the field work itself and the evaluation of the results really goes a long way in providing the state the assurances that we are in fact being open and that everything we do is subject to their concurrence.

MR. GRENDON: What does NWTS mean?

MR. KLEIN: That's the National Waste Terminal Storage program. It's of course a program that was initiated in '76. It was initially a broad-based program covering 36 states. We were forced to focus on the six states, primarily salt, in '77 for a number of reasons. We're now in the process again of expanding these efforts.

So field work has proceeded with new drilling in each of these four formations. And also, I'd like to point out that the IRG report has recommended -- and we wholeheartedly

support the recommendation -- that the feasibility of deep geologic disposal really has to be established at specific sites. You have to look at what's there, consider the overall system, consider what's there naturally, what you could put in there from an engineering standpoint, and work it all together. We really do believe in that, also.

So we have a fairly aggressive program for expanding our siting efforts, particularly into the non-salt media.

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DR. LAWROSKI: Where is Alliance, Kansas, on that map?

MR. BECKETT: Right in the upper corner of the Permian Basin.

DR. LAWROSKI: It is a part of that. Okay. I thought it was further east.

DR. PARKER: I think you're right, Steve. I think the basin wasn't placed properly.

DR. STEINDLER: Do the governors —

DR. LAWROSKI: Have you misplaced the Permian Basin?

MR. KLEIN: I was saying coming down here that given the high esteem with which everyone regards the ACRS and its consultants and all that I wasn't going to be surprised if I was going to be asking you questions at the end of the session instead of the other way around.

DR. PARKER: I think it should be moved over to the middle half of the state, Steve.

DR. LAWROSKI: Thank you. Did you have a question, Martin?

DR. STEINDLER: Do each of the governors in each of the states in which you're doing your bore hole drilling, your drilling right now, understand that their area is a potential repository for waste?

MR. KLEIN: In most uncertain terms — or most

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certain terms, excuse me.

(Laughter.)

DR. STEINDLER: Which one do you like? In effect, what your saying is that each of the places in which you have received these at least tacit approvals from local government officials, each of those places are prepared to accept a full blown repository.

MR. KLEIN: Oh, not at all. No. Before we do anything in the state, we work with the state officials and ortentimes again that includes the governor. But really this just covers the specific scope of work. We're in the geologic exploration phase of our studies now. The only thing we're intending to do is look at these formations, consider what's there, characterize them, and determine if, in fact, there's any potential for repository development there.

DR. STEINDLER: If logic tells you that someone who approves your explanationn, knowing full well that it is possible that you find an acceptable site by continued exploration, would then ultimately be faced with the question, wouldn't that governmental body accept a repository for that point, and if the answer is predetermined to be no, there isn't any point in allowing the drilling in the first place.

MR. KLEIN: I think that the fact that we are

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there and it's with the state's consent shows that they are receptive, owing to national interest, the recognized need to have repositories, to contribute to the solution, particularly if we're studying in a regional sense -- if everyone is doing their fair shares -- no one state wants to be the national dump, if you will.

DR. STEINDLER: I understand that. I'm simply trying to explore the extent to which the local governmental bodies have, by approving your exploration, tacitly given you approval or have given approval to a much broader potential involvement.

MR. KLEIN: No, the approval just really extends to the immediate scope of work that we're proposing. I'd say when the time comes that we can or cannot propose a site as being what we consider being technically qualified for licensing, then that will have to be discussed with the state. They may or may not agree. They may think that more research may have to be done. They may decide that the public or the state attitude is just too negative to allow them to support it at that time.

We're several years away still from being able to propose any specific site, so it wouldn't be fair to ask them for blanket approval to go ahead, and it's not consistent with our policy of consultation and concurrence.

DR. LAWROSKI: Go ahead with your presentation.

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MR. GRENDON: May I point out that political positions change. Governors and legislatures change.

MR. KLEIN: It's an uncertainty which we have to live with, and it's unfortunate, but that's the way our system works.

MR. BECKETT: Could I make a comment, Keith? I think Texas -- the discussions we had in Texas, to me, were pretty interesting. Texas, of course, has permitted exploration, but I think the state government looks on this as a national problem and, you know, looks ahead for its exploration to meet the national need.

People, though, in Texas say, well, we're concerned, for example, that Michigan doesn't let you explore and we do. Aren't you really precluding identifying the possible site under those conditions?

So the states are looking at each other, and I think there is general movement, as the educational process goes, and the needs of the country are better understood, and I think the states are moving toward -- if everybody is in this thing, everybody cooperates -- will remove their individual objections.

That is what we're trying to do, and we're not doing it by heavy-handed methods.

DR. LAWROSKI: Go ahead.

MR. KLEIN: Okay.

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(Slide.)

Along the lines of our expanded exploration efforts, I would point out the argillite formations which are currently the subject of a literature study being contracted out by ONWI, which will culminate next year in identifying areas of potential interest where we might entertain doing field studies.

Of course, once we do and reach a point where we can identify our specific interests, then we would discuss that possibility with the affected states.

DR. PHILBRICK: May I comment a moment, Steve?

DR. LAWROSKI: Yes. Go ahead.

DR. PHILBRICK: There was a question just a bit ago on the extent of the Permian Basin. Now I'll give you a question on the extent of the granite. It cuts across on the sheet you have shown, but it follows that Permian Basin.

(Slide.)

MR. KLEIN: Here's the slide.

DR. PHILBRICK: And I did field work down there in Virginia in 1928, we didn't have any granite in the area that you've got mapped when I did field work in West Virginia, they didn't have it there. It doesn't extend across Maryland as you show it. It doesn't extend all the way across Virginia as you show it.

My feeling is that you have a basic error, and

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I'll tell you about the state of Maine in which I did field work in 1931 and '32 and which I have traveled a good deal on foot, but not on horseback, and the area that you're mapping here as granitic is covered with slate.

Now if you are going to have amongst the scientific community a feeling of reliance on your technical work, then it must be accurate. I don't know who you got this information from, but it doesn't come out in the areas in which I'm particularly knowledgeable.

DR. LAWROSKI: I understand that in the environmental statement that the Permian Basin, at least, is placed correctly. That's why I asked the question about Alliance.

DR. PHILBRICK: The same thing applies on page 3.1.11 in the draft environmental impact statement. Your figure 3.12 shows error. This is major error. And there are going to be a lot of guys who have walked this country and know what the rocks are, and they're going to look at this, and they're going to say, "Those guys don't know what the hell they're doing." And that you cannot afford to have.

MR. KLEIN: Are you talking about at all depths or primarily surfacial formations?

DR. PHILBRICK: How deep do you want to consider?

MR. KLEIN: I'm not a geologist. I'll have to

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take your word for it.

DR. PHILBRICK: From an engineering standpoint, how deep do you want to explore?

MR. KLEIN: To 3000.

DR. PHILBRICK: Then what I'm telling you is the absolute truth. If you want to go down to the basement, then you can find granite at greater depths. And in that case, then you've got to cover a great deal of the Mississippi Basin, because the basement underneath that territory is, in many cases, granitic.

So go back to your guys who drew the maps, tell them to go back and check their data.

MR. KLEIN: Well, when I say we're only interested in 3000 feet, one of the purposes of the screening study is to block out these areas which are either at depths which are of no interest or too shallow to be of interest. So I can't attest to the accuracy of these viewgraphs, unfortunately. I appreciate your pointing this out.

DR. PHILBRICK: It's in the draft environmental impact statement, in error.

MR. KLEIN: I'm glad you pointed that out. We'll have to take another look at it. It's most unfortunate.

DR. LAWROSKI: You may have been going to some of the wrong states?

(Laughter.)

MR. KLEIN: I wonder now if we're really looking at salt or just something that looks like salt. Hopefully, it's just an administrative error and the geologists have just become so used to seeing these that they don't really check them anymore — something as simple as that.

(Slide.)

Another item which I believe your all familiar with, the Earth Sciences Technical Plan, represents a joint effort by the Department of Energy and the USGS to map out just what exactly what we have to do in the earth sciences area, covering research technology development, lab testing, field testing, to get from where we are now to the point where we can confidently say, recommend specific sites as being technically qualified. It's no simple task, and the kind of delays we're encountering in this Earth Sciences Technical Plan, I think attest to that.

A lot of people have vague ideas and general impressions and general ideas of what needs to be done, but when you get to lay it on the table as to what specifically it becomes a little more difficult.

We have made substantial progress with the area of the Earth Sciences Technical Plan.

(Slide.)

A first cut, which ended up not being a plan but really being a framework for addressing this overall

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question was issued in January '79, and you've probably already seen it. It identifies the different barriers and the multi-barrier approach, the deep geologic isolation. It identifies the different time-frames and locations and asks fundamental questions concerning the state of knowledge that affects how much we know about the different barriers in the different time frames.

It also compiles the existing work in the earth sciences technical area as a baseline from which we can identify new tasks that need to be done to make sure that all the questions in this matrix of time and location versus barrier can be answered in a suitable time frame.

We expect to have a draft plan out by the end of this calendar year, and that will be widely distributed for review and comment. Then, hopefully, independent technical experts will be able to contribute to that plan, really becoming a first rate document that everyone can have confidence in.

DR. PHILBRICK: Will that document define the various media in which you will consider storage of waste?

MR. KLEIN: I don't know if it specifically will. I suspect that it does. I think we already -- I could give you a tentative answer.

I really believe we are open to all viable candidates. It becomes a matter of priorities with the

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funding dollars that you have -- where to focus in the near term. Things that we know more about probably receive more emphasis, considering that generically there seems to be no perfect host rock medium. Each has different advantages and disadvantages from the generic standpoint, but you really have to consider it as part of the overall system at specific sites and look what's there.

You pointed out, I remember, Mr. Philbrick, at one of our NRC briefings, I believe it was you, the potential for shale beds interspersed in salt horizons as being a potential medium. That's attracted quite a bit of interest, and it's precisely that sort of thinking that we're trying to promote to the best we can among our contractors in terms of a systems approach.

DR. PHILBRICK: This is a very interesting thing, because there seems to be no real relationship between the actual waste package and the medium in which it's placed, and the waste package and the medium should be in equilibrium. And if they were in equilibrium, we've got a completely redundant situation.

Now this is a scheme which was presented to DOE, to ONWI, a year ago by Stone & Webster, and there's been no reply from ONWI to Stone & Webster.

And I would like to point this thing. The concept includes the fabrication of radioactive waste canisters

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from a nickel-iron alloy that can be demonstrated to remain stable in various maphic rocks for more than 100 million years. Two, to surround the canisters with a buffer media composed of an assemblage of rock forming minerals that are stable with respect to both the canister material and the proposed host rock and that would swell when it reacts with water under the influence of waste generated heat and would become an impermeal barrier to further groundwater incursion.

And thirdly, to site the proposed repository in one of the ultramaphic rock types compatable with the canister alloy and buffer minerals.

Now this gets to be of considerable merit when you go back to the points you've made so beautifully with respect to relationships with the states and the ability to explore and eventually the ability to place and build the repository.

Now, since you're not a geologist, may I point out that a maphic rock is one which is high in iron and high in magnesium. Okay, where do you have that on federal property? Do you have it at Hanford? Right there in your hand.

The important thing, I think, for DOE to do is to examine this concept proposed by Stone & Webster, submitted to ONWI sometime in the last year to see whether the thing

looks as good to you fellows as it appears to be on the surface.

Now maphic rocks are not confined to Hanford. They're scattered all over the country. And if you're looking for a piece of ground in the north, you can take the Duluth gabbro on the western side of Lake Superior. You can find similar situations, if you will, in the eastern part of Maryland. So there are different places where this type of thing can be found.

That's all I've got on that point.

MR. KLEIN: I appreciate it, and I think that suggestions of that type are primarily responsible for our really trying hard to take a systems approach.

It reminds me of one other thing I forgot to point out in terms of our expansion of siting efforts is that we have also allocated in FY '80 for a national screening effort based on criteria which we haven't developed yet. But it would at least, conceptually -- we're hoping it would embrace concepts exactly like you're pointing out.

DR. PHILBRICK: Completely redundant, which is what you've been looking for.

MR. KLEIN: Independence and redundancy, I guess, are two different things. It certainly is a goal which we'd like to strive for -- complete redundance. But whether or not, in practicality, we can achieve that in an absolute

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sense, I don't know. But that's getting into more details.

I hope we can continue this dialogue and that it can get communicated to the right people. There's no reason for not having answers or at least good responses to good, sound technical proposals. So I'll pursue that.

DR. STEINDLER: Excuse me, this Earth Science Technical Plan that is going to be issued, I gather, by the end of this year presumably has a time schedule target at the end of which period all necessary information dealing in the area of earth sciences will become available for, and you can fill in the blank, repository design, licensing action, et cetera. Can you identify by when all this information should be sufficiently available? In other words, is there a target goal for repository —

MR. KLEIN: We do have target goals that are set more by national policy and which will be set based partly on a siting strategy or options for siting strategy which have been proposed to the President and, as I understand, are on the President's desk now in the form of a decision memo.

But the Earth Sciences Technical Plan, to the extent that it can, will be consistent with those target schedules. But the primary thrust is that we have interim capabilities to manage these wastes in an interim manner for Lord knows how long and still preserve health and safety.

That's not to belittle the need to get on with actually disposing of them, but their primary importance, at least in our view, is just knowing exactly all the things that we have to do or develop a technical consensus as to what we have to do. And we'll take as long as it takes to do it.

So far it looks like we are, in fact, on the right track in all areas and have most of these things covered and the results will be in in a time frame that's consistent with the starting of the licensing process. We'll be able to support with confidence our siting recommendations.

But I don't want to prejudge the results of the ESTP. It is composed of people outside the DOE programs. It is heavily influenced by USGS, and there may very well be things identified in there which we had not thought of and had not been included in the programs before which could impact the schedules.

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DR. STEINDLER: What you're saying, that the whole programmatic structure and the pace at which you're going, is going to be set by a presidential decision not yet made? And from there on, you're going to try and structure your research program to meet that schedule?

MR. KLEIN: The siting strategy, the target schedule for repository development, will be set by the presidential decision. The technology development, really, is as far as planning, we're proceeding as fast as we can. We're more limited by availability of people, qualified people to work on these programs, than anything else. And of course, a lot of this, too, can be bounding uncertainties rather than resolving them, in which case you can live with the result from some of this long-term R&D, not really coming in, as long as you can bound it and accommodate it in your overall approach.

DR. PARKER: Mr. Klein, now that you've brought up the question of redundancy, I wonder whether you'd like to comment on the exchange of letters that took place this summer between Mr. Martin and Mr. Myers on this whole question of multiple barriers. And we've been told by the NRC people that DOE concurs with them that, you know, one needs complete redundancy to ensure that one has a proper site, that one has to open up at depth and explore at depth a number of sites before a proper site can be chosen. Is

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that DOE's policy now?

MR. KLEIN: To the best of my knowledge it isn't. I think this matter is still open. My understanding of it is -- again, I'm not at the highest levels of DOE, so I may be a bit behind the times on this -- but my understanding is that we're still discussing it from a DOE standpoint. We're developing a thoughtful position on the practicality and the necessity of some of what we understand to be the NRC staff proposals.

DR. PARKER: Will it be a formal response in addition to one that's already been given by Mr. Myers to Mr. Martin's letter?

MR. KLEIN: Presumably. I know we're still thinking this out. We're going to be meeting with ONWI in the not-too-distant future to discuss this matter with them some more, so we're still developing our position. And I feel relatively sure that our position will be spelled out in written terms. Gene, would you agree to that?

MR. BECKETT: I believe we're going to give formal comments on part 60. I think that is the medium in which, I think, their draft in part 60 discusses the necessity for exploratory shafts, prior to a decision. I don't believe we fully endorse that, because one could find an acceptable site and characterize that site in an acceptable matter, without perhaps having to characterize three sites. I think

the idea certainly in the WIPP project, endorses getting some in situ measurements to assist in repository design, and also to give us go or no-go information early in the process.

You talk about having to do that at many sites in order to select the best of those sites. I think it presents some problems.

DR. LAWROSKI: Mr. White? Did you have your hand up?

MR. WHITE: Yes, I'd like just to maybe amplify on what he said, a little bit. We've given DOE advance notice. We'll probably arrange a meeting right after the DOE presentation.

DR. LAWROSKI: What have you given to them?

MR. WHITE: A copy of the advance notice that you'd gotten yesterday. I don't know all the particulars, but I do know there are a number of issues not in total agreement, things like, I think there's a general concensus on the need for doing the in situ testing to determine site suitability, and I agree that there's still an issue as to the level of the investigations at alternative sites in order to make a reasonable comparison. That's one issue.

I think — I can't speak for Colin, but from the last impressions I got from him, the 1000 years, there wasn't too much controversy about that.

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MR. KLEIN: I would take exception to that. We're still thinking that out also.

DR. PHILBRICK: Which way are you thinking? Are you thinking of 1500 or five?

MR. KLEIN: I'm not qualified to give you a DOE opinion on that. It may very well be reasonable and practical, we're giving it some very thoughtful consideration. It's created quite a still, the 10 CFR 60, I think its safe to say, in the Department.

DR. PHILBRICK: Let's go back to shaft sinking for a moment. This is an expensive and time-consuming operation, because you're going down to depths where you have to provide ventilation and all sorts of things. You may even need an escape shaft, who knows? So you may not be in a position where you can get away with one shaft, you may have to have two. There are available, that is, there are present, in the Salina Basin, shafts which penetrate the salt. Has there been any approach to the producers of commercial salt to utilize their openings for testing in situ?

MR. KLEIN: As a matter of fact, at Avery Island, there's a salt dome in Louisiana.

DR. PHILBRICK: That's not the Salina Basin.

MR. KLEIN: I'm sorry, I didn't hear.

DR. PHILBRICK: You've got a perfectly good,

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unoperated shaft put down by Morton Salt. You've got Cargo Salt, which is operating at the present time, in the Salina. If it's in New York state, what you find in Salina Salts is not going to be too different from what you find in other salts. Has DOE done this kind of thinking?

MR. BECKETT: In the WIPP program we have looked at and have negotiated with some of the potash mines in that area. I believe — was it the Climax that we've been negotiating with? I don't recall. That's sort of a matter of a piece of the program and funding. But we have attempted, and would like to do some in situ measurements, in the existing potash mines. The potash zone is somewhat higher, I believe, that is like 1000 to 1500 feet.

DR. PHILBRICK: Have you thought about putting down an inside shaft instead of going full depth from the surface? In other words, are you thinking in terms of doing this thing as cheaply as you can, to get results which will be sufficient to quantify the situation?

It is very simple. We dig a shaft, everything is fine. But you spend a hell of a lot of money.

MR. BECKETT: That's correct; and one would need an escape and ventilation shaft. We're talking about a mining operation. We're talking in the $20 to $40 million range.

DR. PHILBRICK: As a matter of fact, it's DOE

who's doing this thing in Sweden.

MR. KLEIN: Yes.

DR. PHILBRICK: And you're using somebody else's hole in the ground.

DR. LAWROSKI: You're talking about the Stripa granite.

DR. PHILBRICK: Yes, so it would seem to me that you ought to look for the same type of situation in this country. Why give the Swedes the benefit of everything?

MR. KLEIN: We have, I think, some potential sites, mines in fact, were identified in the Salina Basin specifically. I think more than anything else, the institutional problems there have impeded anything coming, of some specific proposals. No one can argue with the objectives of getting as much for our bucks as we can, utilizing the existing natural ore conditions wherever we can.

That's why we took advantage of the Avery Island salt mine in Louisiana, and we've capitalized on that further by planning -- and we've actually started some brine migration tests at the Avery Island mine. It started out being primarily an opportunity to do some thermomechanical tests, or to get some data to confirm the models and thermal conductivity and a few other things. But we seized upon that also as an opportunity to resolve with USGS the brine

migration issue.

DR. LAWROSKI: I found it somewhat surprising to read in that DOE letter, the matter of the form of the waste. The question was a new one, the importance of it. I though DOE a long time ago in its studies related to solidification of wastes took into account the possibility that the form would provide a great deal of protection for quite a long time against the release. That was one of the reasons for low leaching, low leachable solids, was it not?

DR. ORTH: Yes. On the other hand, if I may be spared a comment at this point, the Oak Ridge reports that talked about the basins, the salt basins and the bedded salt, have the explicit statement, which I can't quite quote accurately, but it goes to the effect that once one is in a dry environment, down in the salt pit, it doesn't make any difference what form of waste you have.

With that kind of a background, the alternate waste forms has been not really a matter --

DR. LAWROSKI: But long before that statement appeared by Oak Ridge, people were looking at that world wide.

MR. KLEIN: As a matter of fact, the next bullet on this item Alternate Waste Forms Research, it's particularly timely. I have some slides I think that could contribute to just the discussion you're having.

DR. LAWROSKI: Were you through before that, or it that what you were going to take up next, anyway?

MR. KLEIN: This is what I was going to take up next, anyway.

(Slide.)

Prior to the IRG recommendation, I'm sure you're all aware, silica glass had been the waste form of preference for the liquid wastes resulting from the defense activities. As you know, all this waste forms research is really being done under the auspices of the defense programs. That's where the liquid wastes are, that's where the reprocessing is. And so, that's where this work is going on.

Prior to the IRG, there were investigations geared toward alternative waste forms, evaluating different ones, and a decision was going to be made in FY '80. We really thought that we were further along in that we really need be. The current approach is that we initiated a much broader review, a much more encompassing review of alternative waste forms, and we intend to select two to four by the end of fiscal year '83.

So, we're still retaining the silica glass as a reference, but we are designing a program to try to accommodate changes to that. From what I understand, the actual equipment for making the waste form can kind of

pbAV

develop a little bit following the facility development for processing the waste from the liquid form. So we can proceed with our plans and programs for facilities at Savannah River and Hanford and Idaho for the solidification of those wastes without needing to make a decision as to what exactly the waste form will be.

At this time in fact, we don't even need to make it in 1980. We can wait as long as '83 for a final decision in '84.

(Slide.)

So, what we're doing is preparing a high level waste management strategy document which will essentially summarize in detail all the plans for this alternative forms investigation. That will be made public at the end of '79.

(Slide.)

Specifically, some of the activities that we do have planned at this time, and I'll be getting a few more slides, some more into the details as to what are these alternative waste forms -- I don't think I need to bother to read this, it's in the package for those of you that are interested.

DR. PHILBRICK: What's DWPF?

MR. KLEIN: Defense Waste Processing Facility. This is a little bit out of my field, but I believe that's the name of the facility that will probably be processing

wastes. Savannah River is bringing the first defense installation that will have the wastes solidified.

DR. FOSTER: Mr. Klein, at this time, the technology essentially has been demonstrated for glass as a form, let's say, that's commercially available. If you went to some other form like supercalcite, could you give us an idea of how long a delay you would think would be involved in being able to bring one of those other processes up to a level that we presently have for the glass?

MR. KLEIN: One of the things that has been done is formation of an independent generic assessment group, which is considering all the different candidate waste forms, considering them from a number of different standpoints, scientific feasibility and engineering practicality being among those. So what you're pointing out is really an engineering practicality standpoint, which will be a factor in the prioritizing of the candidate waste forms for detailed work.

Right now, it's not an overriding factor. We're starting out with scientific desirability, feasibility and its merits set aside from engineering practicality. And that may lead to some new waste form work being done. It is being done now. Essentially, this viewgraph, which is also in your package, lists the different waste forms that are under consideration and you can see that a number of these,

over half, have just recently been started. And these are a direct result of the IRG, and it expands, or it covers everything from synroc — you name it, just about anything you could want is in there, and will be there, given some serious consideration in the next year or two.

So, does that --

DR. FOSTER: Not really. If you decided not to use glass at this point, but go to something else, would this take something on the order of 10 years to get the process demonstrated and ready to go commercial?

MR. KLEIN: It would depend on which form is selected. I don't think there's a generic answer. For a number of them, the majority, my understanding is no, it would not be that magnitude of effort. We're looking at something that could be used for the Savannah River plant, in the mid to late '80s time frame, so that we can proceed with the facilities for developing that solidification without really needing to know exactly what the waste form is, because the equipment for processing or making that waste form can be almost considered to a certain extent a black box which gets put in near the end, if you will.

So, I'll have to refer your question to some people that are more familiar, that can talk to the individual items. I think you'd almost have to consider it on a case-by-case basis.

DR. PHILBRICK: Can I ask you a question on policy? How come I don't see any of the glass companies listed there? Or any of the metallurgical companies, or any of the people that are involved in ceramics? There isn't anybody there.

MR. KLEIN: It doesn't seem rather ivory-towerish, doesn't it?

DR. PHILBRICK: I happen to know, I live in New York state, you also have Corning in New York state and I don't see anything in there of people who have made their living developing new things. These guys are all supportive people.

DR. LAWROSKI: Corning was listed on the previous slide.

DR. PARKER: That's just a review panel, Steve.

DR. LAWROSKI: I know.

DR. PHILBRICK: Why is this, why does the Government always go to the universities or someplace else?

MR. KLEIN: I think these are primarily --

DR. PHILBRICK: These are consultants that you've got there.

MR. KLEIN: These are prime contractors basically here who coordinate the overall efforts. I believe they contract most of this out to glass firms such as Corning from people who really have the brains and the innovation. I believe. I will have to check into that if you want to know the specific contractors who are doing this. But it seems to me that that is where the expertise lies. That is where this stuff would naturally go. These are lead contractors, if you will, that provide technical management and subcontract out the detailed work. So, I am not entirely sure that what you have stated should be the case is not the case. It may very well be that Corning Glass and people such as that are in fact doing the detailed work.

DR. PHILBRICK: Thank you.

(Slide.)

MR. KLEIN: So, you can see that we are taking a serious look at this, at the alternative waste forms development.

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(Slide.)

I might point out some of the names of people that are on this independent review panel that are considering all the candidates, and if you will prioritizing them and helping us figure out which ones should receive how much attention in the near future. If anyone is interested, I have some additional supporting viewgraphs to show you how they've gone about ranking these -- the different factors that have gone into ranking different alternative waste forms which resulted in the kind of bottom line, which again is this viewgraph shown earlier that shows what we will be working on in the '79 and '80 time frames. So, if anyone has some waste forms that aren't on here, I can show you why they aren't.

MR. GRENDON: This is that alternate waste form peer review panel that put out a report on August 20th?

MR. KLEIN: I believe that's it, yes, sir.

MR. GRENDON: Which we have.

MR. KLEIN: Okay. Well, that's the tie-in.

DR. STEINDLER: Let me make one comment in response to Skylar's question.

There is, I gather, which you didn't bring up -- there is, however, a significant effort made by DOE to distribute funds to universities for the kind of research that is involved here. That's a policy decision, I gather, on the part of DOE. It's one reason why you find a significantly

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increased role of universities as time is going on. That is superimposed on the whole thing.

DR. PARKER: Steve, I'm forced to say something. If you look at the amount in comparison to what has gone into the national laboratories and the other supported organizations, miniscule amounts.

DR. LAWROSKI: So noted. I think the question -- it has been raised in other forms.

I think there are some problems of people wanting to know right away what the situation is on patents. That often has been a stumbling block, not that I agree with it, but it's not always easy to make money in this game. Some of the most qualified people have other ways of making money much faster than this. But I would -- it certainly would be useful for you to ascertain that your contractors whether they be -- especially in the national labs -- whether they avail themselves of the industrial expertise that does exist in this country, or perhaps even elsewhere.

MR. KLEIN: If you'd like I'd be glad to check into that and tell you who exactly is working on what and at what level. I might add that the next few viewgraphs will show a much broader organizational structure, which is really going to take charge of this whole thing and will have a major role in determining who does what sort of research and in what sort of time frame. And in the sense that this has not been set up yet,

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there is, I believe, or there will be, considerable new opportunities for waste form R&D. And certainly we would be open to suggestions as to people who are qualified and interested and have the innovation and experience to do some of this work.

(Slide.)

Materials characterization organization, which is being set up is primarily being set up to test and qualify materials for repository disposal. That's kind of a broad statement, but we found that a lot of the efforts that had been done in the past, particularly when you talk about expanded effort, there's a considerable amount of coordination, standardization of testing, considerable thinking as to just what makes a waste form qualified for what purpose. Some sort of uniformity has to be applied to get good relative comparisons. And essentially, those are the driving forces behind the formation of these materials characterization organization.

(Slide.)

It will be essentially composed or consist of four different elements, a materials steering committee, which has just recently met and will establish interface control mechanisms, the waste form interfaces with the cannister interfaces, interfaces with the back fill or overpack absorptive materials, and so on, and approve membership and Chairman of the Materials Review Board.

The Materials Review Board will be proposed by Savannah River. The field office responsibility has not been designated yet. They are intended to represent a broad perspective and a wide range of expertise and include some members from outside the current Waste Management .

MR. GRENDON: The same means some, doesn't it?

MR. KLEIN: Yes, I think it should be some. I am not really sure. It's being set up to further standardize this research and development effort. There's a Materials Characterization Center to be established at Pacific Northwest Labs of Battelle and Savannah River, who was the furthest along, because they have the near term problem with the Savannah River wastes. We'll provide initial guidance and funding for that lab. And that's where there have been standardized tests on different candidate materials or -- excuse me -- that's a literature outfit and software FULD. Independent Measurements Laboratory, which is yet to be proposed or a specific contractor or organization is yet to be proposed, is the fourth element of this overall materials characterization program. And that will comprise the lab test, hot cells, the actual hardware end of the Materials Characterization Organization.

DR. STEINDLER: Did you say that the Materials Characterization Center was primarily a literature and software group?

MR. KLEIN: I should really check on that. I am not

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quite clear because I haven't been involved in this.

DR. STEINDLER: I don't think that's correct.

Could you identify who the people are who represent the Materials Steering Committee? Who is on it?

MR. KLEIN: If I could hold that to the end, I believe that I do have some backup material that has that.

DR. LAWROSKI: Is that last one Battelle Northwest, or what is that? Independent Measurements Laboratory?

MR. KLEIN: That's the Richland Columbus. It's the DOE field office. It's an arm of the Richland operations office, which is located in Columbus, and still located with the ONWI office of Nuclear Waste Isolation. I am not clear on the rationale or why they are proposing a particular contractor but if anyone is interested, I would be glad to check into that.

(Slide.)

The next item -- I see many of you are getting pretty hungry. I will try to speed this up.

DR. LAWROSKI: You go ahead. Don't worry about that. They can get hungry.

(Laughter.)

MR. KLEIN: What we've done in the area of low level waste burial (Slide) specifically what's happened since April when I presume you were briefed on this (Slide), essentially Idaho has been designated as a prime contractor for this effort

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and they have been rather aggressive and set up an extensive program for looking at the low level waste situation of figuring out what we shall do. I don't intend to read all this, but just to kind of show you the scope of the organization that has been developed, and the scope of the effort that's being applied to this.

On the viewgraph you can see that it covers a wide range of activities; in technology development, in criteria and standards development, systems analysis. It is getting to look more like a high level waste disposal effort.

(Slide.)

DR. LAWROSKI: Except for the number of places where we can send the stuff to be buried.

MR. KLEIN: Right. Essentially, though, it boils down to two basic efforts, the waste treatment and then the disposal.

There is technology development going on in the waste treatment effort, and in disposal there are a number of activities which have been initiated to identify the sites where the DOE low level wastes can be disposed. And the future of DOE contains some of the responsibility for disposing of the commercial wastes where they could also be disposed.

(Slide.)

In terms of waste treatment, candidate solidification agents have been surveyed, and a plan for developing the

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solidification agents will be made available next fiscal year.

The two techniques for fuel fabrication of liquid low level waste treatment ought to be available by the end of fiscal year '81. Their primary tasks, which are ongoing, not really any new initiatives in that area are the biological denitrification and the ultrafiltration waste processes.

MR. GRENDON: I am not sure that I understand what fuel fabrication liquid low level waste means.

MR. KLEIN: Unfortunately, I am not sure either.

(Laughter.)

MR. KLEIN: In the fuel fabrication process, I believe there are liquid low level wastes that evolve and I am fairly sure that all that refers to is those are the low level wastes that they're looking at treating. It could have been worded a little better.

DR. LAWROSKI: It's probably from recovery operations, especially.

DR. ORTH: I would make a wild guess. If you're talking about fuel fabrication low level waste from that, you usually start out on fuel fab with the UF-6, which means you have precipitations operations. You have liquid effluents. As you go through the system you have various decontaminations and recovery solutions as you recycle material. Things of that nature.

MR. KLEIN: Thank you. And continuing development

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incinerator technology application. That's interesting.

Most of the incinerator technology development or application of the incineration of wastes is applied in the past to TRU wastes primarily. So, this represents some effort to take a look at that application to low level wastes. Because, of course, the volumes from low level waste are quite significant.

(Slide.)

The alternative disposal method consists of a scoping of viable alternatives. This is to shallow land burial, looking at intermediate depth disposal and have some plans for demonstrating that disposal and there are some additional alternatives being looked at, essentially things that are more along the lines of deep geological disposal and systems approach. And on looking at the application of some of the disposal of high level wastes to low level wastes, as an additional alternative to the shallow land burial.

(Slide.)

The next item I want to touch upon is some of the latest development at the Hanford site and at the Nevada test site. This is getting back to high level waste disposal.

(Slide.)

At Hanford you probably recall that were looking and identifying specific sites at Hanford that we think would be suitable, and we had identified some specific sites at

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Hanford and let me back up -- specific sites is represented by identification of what we call candidate sites. Candidate sites may or may not be qualified subject to detail site characterization and evaluation and so it really represents a honing in on specific sites that we're now going to study in depth at Hanford.

The near surface test facility construction has been completed. There are two phases of test: The first phases involve heater tests in the holes that have been excavated into the mine and the second phase is the spent fuel test, and the holes for the first test are being completed and the technology development proceeds. You have already been briefed on that since you last met an architect engineer. It has been designated for basalt waste isolation project. He will be conducting a conceptual design study for a repository in basalt at Hanford. And the contract includes provision options for Title 1 and Title 2 design. Should the technology in current investigations being conducted show or confirm that Hanford has the potential, the site looks good and all systems are go --

MR. GRENDON: What's NSTF?

MR. KLEIN: I am sorry. Near Surface Test Facility. That's the tunnels that have been bored into the side of a mountain.

DR. PHILBRICK: Is that the correct spelling on the

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repository engineering group? The word following Parsons.

MR. KLEIN: Oh, that's Parsons. I think that's not the correct spelling. Brinkerhoff, I believe, is the name of the organization. I will have to get on my boss on these.

(Slide.)

At the Nevada test site as you may or may not be aware, as you recall on the high level waste disposal program, the national waste terminal storage program, specifically the ONWI effort and the basalt effort and the Nevada test site effort at the Nevada test site, we were looking at a number of different potential host rock media. It turns out that almost all of them are too complicated or there is something rather wrong with them. We are left with tuffs as a media of a continuing interest, and were continuing to look specifically at some sites where the tuffs are available.

DR. LAWROSKI: I should think that that would be an attractive place to keep pursuing inasmuch as you've got a lot of contamination from plutonium anyway, as it occurs from the testing program and so on.

MR. KLEIN: That's the whole rationale for being there and for being at Hanford.

DR. LAWROSKI: That was pointed out, I think recently, by Dr. Hammond in an article. I think in the Scientific American or American Scientist.

MR. KLEIN: Approach at Hanford and at NTS is to look

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at what's there to see if there is something there that can be used as part of an isolation system, or as in the off DOE sites we're looking for what we want and it's wide open.

DR. STEINDLER: It isn't completely clear, however, that that site would meet the exclusion criteria that we heard about yesterday.

DR. LAWROSKI: Correct.

DR. PHILBRICK: How do you relate this second item under insight to testing with the first item you have on the sheet? The first one says granite and shale deposits technically disqualified. You come down to climax granite, and you're testing down there.

End t-12

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MR. KLEIN: I'm sorry, I'm not following you.

DR. PHILBRICK: The first item says, within boundaries or not by subordination to weapons testing program, granite and shale technically disqualified.

MR. GRENDON: And then the second item says it's outside the test site.

DR. PHILBRICK: Is that outside the test site?

MR. KLEIN: Excluding NTS. We've gone this far in studying the regional hydrology and learning about the overall geology of the area. Perhaps we shouldn't give up so easily and just take a look at what is available off the NTS site.

This is not really tied in with our on-way program, which is basically charged with off-site exploration. But it's common sense, you know this much about it, let's work with the governor and see if we can't look just a little bit off the site and see what's there before giving up entirely.

DR. LAWROSKI: To answer his question, it's a different locale.

DR. PHILBRICK: Climax granite is off the NTS?

MR. KLEIN: No, no, no, not the climax.

DR. LAWROSKI: The second one.

DR. PHILBRICK: I understand that. Is climax on the site?

MR. KLEIN: Yes.

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DR. PHILBRICK: All right.

MR. KLEIN: I'm not sure if climax is in these areas. Climax is only a the test facility, not a potential site for a repository. It's not subject to the same exclusion area.

DR. PHILBRICK: All right.

(Slide.)

MR. KLEIN: I've already touched upon some of the institutional progress that we've made in dealing with the states in terms of allowing our exploration efforts to proceed and get down to studying specific sites. I won't go into that again.

I've also talked about the brine migration test at Avery Island. There's another example of coming along in the in situ, getting out in the field in the actual field testing arena.

As you probably recall, we do have in situ testing going on in the Condesonga shale in Tennessee, Avery Island, The Stripa mine in Sweden, near-surface test facility, Hanford, and also climax facilities.

So we are being aggressive in the in situ testing arena.

Sandia has recently initiated some bore hole plugging tests at Bell Canyon. Gene can probably tell you more about that. It's testing the bore hole ceiling technology

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specific cements, and just prolonged technology development in that area which we all consider quite important.

Going back to the overall DOE framework, another significant event that has occurred in the last few months has been a transfer of remedial actions program to the Office of Nuclear Waste Management.

Before, these responsibilities lay primarily in a different organization within the Department of Energy. It's now been moved to the Office of Nuclear Waste Management.

(Slide.)

Their specific objectives are to get on with the facilities, the decommissioning, the actual work that needs to be done to correct situations which in the past have led to less than adequate disposal.

Everyone's probably aware that the potential hazards of low level waste are real and they have to be dealt with. We have old facilities and old sites that really haven't been completely decommissioned.

And this program essentially is to get on with remedying those situations.

(Slide.)

I've got a little bit more as to what constitutes the different elements in that program. In the package is some additional information on each of those, and I can get you as much more as you'd like.

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There's the program for remedying remedial actions that formerly utilized the Manhattan engineering district and formerly utilized AEC sites. There's the uranium mill tailings program, the Grand Junction remedial actions program to remove the mill tailings from Grand Junction structures, which is kind of a separate project, decontamination and decommissioning of DOE-owned surplus facilities, and some generic efforts in technology development and R&D.

DR. ORTH: In all of these, I presume you're interacting strongly with the NRC.

MR. KLEIN: I am not that familiar with these programs. It's really just starting within the Office of Nuclear Waste Management. I know that there is strong NRC interaction in almost all of these areas, but I can't say that we are, in certain areas where NRC has the statutory responsibility.

And I will be quite surprised if they haven't bee appraised of all the other activities when it gets down to actually doing things.

MR. BROWNING: They review each of those actions with us.

(Slide.)

MR. KLEIN: In terms of remedial action, specific sites, I just wanted to illustrate in terms of illustrating the progress that has been made, the sites have all been

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identified and characterized in terms of priority. Actions are underway as to the first priority ones and we'll be getting to the others as we can.

(Slide.)

Mill tailings sites similarly have been identified, prioritized, the same sort of situation, work on the high priority items first and as soon as we can, get to the other sites which aren't as much of a potential problem.

(Slide.)

I don't know if you're all aware of the Grand Junction problem, but it's estimated that 800 structures in Grand Junction have been built on or used uranium mill tailings. And these are being cleaned up in a joint federal/state program.

There is specific legislation dealing with these responsibilities.

(Slide.)

In the area of decontamination and decommissioning, I don't think this is in your package, but it does show some of the specific projects that have been completed. A number of people think that the reactor facilities have not been decontaminated and decommissioned.

But this chart shows that there have been some very spec fic cases where thi has been done.

A few other program highlights — it won't take very

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long. In the area of spent fuel storage, three draft environmental impact statements have been issued and the comment period is expiring.

Finals are being prepared. These are in the areas of spent fuel from domestic sources, spent fuel from foreign sources, and on the spent fuel charge, the charge the DOE -- the DOE charge, actually, the methodology for charging the waste generators to accept their fuel.

We have started --

DR. LAWROSKI: This is the so-called away-from-reactor spent fuel storage.

MR. KLEIN: Right.

Another major activity that has recently gotten underway at the department is the development of plans for implementing the National Environmental Policy Act. CEQ guidelines have been issued.

DOE, in turn, has issued its own guidelines for implementing CEQ provisions. And each of the divisions within the Office of Nuclear Waste Management is applying those guidelines to its programs and specifically showing what levels of documentation we expect to put out for different actions of significance in the programs which are upcoming.

Lastly -- well, next to last -- we have recently had approved a public information plan in the division of waste isolation which is essentially intended or provides guidance

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on the generation and dissemination by our contractors, and from us, from the program office itself, information on nuclear waste disposal.

The IRG has pointed out the need to strengthen our communications with the public to allow them to understand what we are doing.

Of course, this information has to be factual and unbiased. The information plan provides for the appropriate checks and balances to assure that this will, in fact, be the case. And we are hopeful through news activities reports -- you might call them newsletters and fact sheets, pamphlets, film, a few items and briefings and so forth -- that we can generally uplift the level of education and perception, what it is we do know and don't know, what the problems are in particular waste disposal.

DR. STEINDLER: Who within the Office of Nuclear Waste Management is going to handle public information? Is there a central place through which everything goes?

MR. KLEIN: There was an assistant secretary for institutional relations and they have a public affairs department within them who provided the centralized oversight policy.

As we've outlined it in the plan, we want to generate our own information, be the instigators of this. They will be a valve in the flow of this information. Everything we

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produce will be subject to review and approval by the public affairs office within DOE.

In addition, most and possibly all this information will be reviewed at high levels within DOE, assistant secretary levels, as appropriate.

But one of the problems in generating material is the number of reviews that have to go on, nad it could be quite frustrating.

We're already started development of some of these things and everyone has their own editorial styles and preferences for the way things should be said.

We're getting them.

Lastly, there have been, and continue to be scheduled, public meetings with the NRC for the purposes of information exchange. We want NRC to know what we're doing or open to their criticism. If they see areas of our program that need to be strengthened or should be strengthened, we want to know about it so we can act on it.

And conversely, we're interested in what NRC is doing to avoid duplication and capitalize as much as we can on anything that we may not be, or anything they found.

So with that, I'm open to questions.

DR. LAWROSKI: Thank you, Mr. Klein. Yes, either to you or Mr. Beckett until 1:30.

(Laughter.)

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DR. LAWROSKI: Any questions?

(No response.)

DR. LAWROSKI: If not, we will recess for lunch till 2:25. I would like to have all of you come back so that we can have some discussion.

(Whereupon, at 1:25 p.m., the hearing recessed, to reconvene at 2:25 p.m. of the same day.)

AFTERNOON SESSION

(2:30 p.m.)

DR. LAWROSKI: Let's get started.

This time I'll start from Dr. Orth's side of the fence for any comments, further questions, so that we're prepared to take it up for the October 25th meeting.

DR. ORTH: I don't know what you want me to talk about.

DR. LAWROSKI: Your impressions and comments with respect to what we heard yesterday and today, for purposes of the report I talked about. It's another annual research report.

DR. ORTH: I started out yesterday morning saying that I hoped it was something like the equivalent of a critical path analysis to make all of these various programs fit into some stated objective. I can state that at this point in time I am not --

DR. LAWROSKI: Why don't you wait until Jerry is here? You can get your thoughts in order.

(Pause.)

DR. LAWROSKI: Now I'll call on Don.

I plan to adjourn not too long after 3:00 o'clock. We can stay longer if there is something useful to be done.

Don?

DR. ORTH: Well, I'll go on to pick up. Yesterday

morning I opened --

DR. LAWROSKI: Anything in particular you can zero in on?

DR. ORTH: My statement that we had -- that I was hoping we could get at relating all of the various programs through some kind of a critical path analysis to some kind of a need for them, and priorities and timeliness of completion, and that sort of thing.

After a day and a half of discussion, there seems to be some of that, but not nearly as much as I'd like to see personally, by way of defining where the programs are going to get, when.

DR. LAWROSKI: Frank, I would hope that by the October meeting -- I hope you're listening.

MR. ARSENAULT: I'm listening.

DR. ORTH: Make another note.

DR. LAWROSKI: And not just RES, but I see Mr. White's listening and taking notes.

MR. WHITE: Yes, I'll take notes.

(Laughter.)

DR. LAWROSKI: Go ahead, Don. Excuse my interruption.

DR. ORTH: I have some noncritical comments. I don't know whether I should be throwing out too many noncritical comments.

The programs have been expanded a fair amount since last year, at which time we pointed out there were some deficiencies, and the programs have included a large number credited to this Committee. So that obviously there was quite some response going on.

A second encouraging thing I note is that there is a much greater tendency, apparently, to go out and define the program and look for a contractor to get it done, as opposed to last year, when a large number of the programs were just sitting around waiting for somebody to propose to do something.

I may have more words when I get a chance to scan my notes. But you called on me first.

DR. LAWROSKI: Marty?

DR. STEINDLER: Well, on a preliminary basis, let me comment on several areas. First off, I personally appreciated the change in the organization of the presentation, which I think for the first time relates to the licensing action and the underlying requirements, presumably, the presumed requirements and activity in the research area, that allows us to make that connection, as Frank has mentioned several times. That to me was a very helpful and, quite frankly, a necessary precursor to being able to see what's going on in the research business and trying to relate it to the function of NRC.

Now, with that as the first shot at it, come a number of deficiencies, and I think these will be straightened

out in subsequent iterations of the same process.

The second point I would make is that, as described by our very first and second speakers, the licensing portion of the activities in the area of waste management appears to have been reorganized according to priorities that I happen to agree with, namely, identify your criteria and guidelines as rapidly as you can and build up some kind of sensible technical capability to be able to assess an application and handle it when one comes up.

Unfortunately, at that point I run into serious trouble. As we reviewed yesterday morning, research related to the waste management licensing activities -- and I'm talking here in reference to your prior comment, Steve -- both facilities as well as processes -- in other words, the total licensing action, as we hear of both technical assistance and research, particularly research related to the licensing activity, that neat organization and set of priorities that I thought I heard in the area of licensing doesn't come through in the area of research.

In other words, I still have difficulty identifying from the assessment of what is a problem in the licensing domain, where and why a particular piece of research is being done. Again, the sum of the research programs seemed to have too little correlation, obvious correlation to the apparent needs of the licensing people.

DR. LAWROSKI: Can you cite what you would consider some flagrant examples of same?

DR. STEINDLER: I have indicated that there is a deficiency of correlation. I can simply cite to you that I have difficulty in finding the connection between some of the research programs, the necessary, the impelling, compelling connection between the research programs and presumably their results and the requirements of the licensing.

DR. LAWROSKI: How much do you include under "compelling"?

DR. STEINDLER: I include that which is necessary because of, for example, the contractive budget. If somebody tells me they've had a 30 percent budget cut, my immediate reaction is, boy, the first thing I would do is examine very hard why I'm doing what I'm doing, to be able to determine what I really need to have until my budget situation clarifies or gets better, which presumably is a year from now.

What I guess I would like to see, if it's possible to obtain it, is the licensing people -- remember, I said, parenthetically, I said that I consider research to be a service group to the licensing function -- I would like to see the licensing function identify for itself and for research that which is of immediate need, that which they have to have for next year, that which they have to have started for next year, and then identify in the research

program those things that match that.

Let me give you a couple specifics -- one other what I guess I would call a major point. We've heard several times that it is important to the capability of the licensing staffs to be able to assess the technical aspects of any application that comes in. And in order to obtain that kind of capability, research is necessary. They must do research.

That's a fundamental tenet underlying some of the rationale for justifying a research program or specific research actions. The fact that research is normally done outside the staff and that the staff's contribution to research is largely programmatic management and overseeing output, with an occasional interaction in detail, apparently an occasional interaction in detail with the contractor, makes me wonder whether it was really such a fundamental point that research must be done by licensing or with licensing, in order to build up a capability to evaluate.

I may have not made that very clear. I can perhaps do a better job a little later.

Three other points I'd like to simply make. The question of cooperation and coordination with DOE programs has been brought up in several ways. I believe the situation is still not satisfactory, although I certainly got the impression that it is much improved over what it might have

been perhaps a year or two ago. I believe this is an NRC-wide problem. It's not limited to waste management. I believe it's a function of the Commissioners to devise a methodology which is not left to the individual division directors or whatever have you, which is applicable to any contact between NRC, technical exchange between NRC and, say, DOE, and will meet whatever legal constraints are imposed on the separation of church and state in which we're currently living.

The second of my residual points is that the risk assessment effort seems to be too weak. My personal view is that the risk assessment effort is the underlying basis for getting started on any licensing action and particularly to be used to evaluate what research you need to have done to improve the quality of your information base.

I'm concerned that current risk assessment work is proceeding much too slowly. I'm concerned about the time schedule.

And finally, while I recognize that this is not directly related to research, I was a little bit chagr ned to hear or see that the licensing portion of NMSS is not capable at the moment of at least addressing the sociopolitical issues which some of us feel are the only major issues left in the business of disposing of nuclear wastes.

Let me close for the moment.

DR. LAWROSKI: Do you have any comments to make

about having the risk assessment still be done quantitatively in one branch for various parts of NRC, as opposed to having some of that kind of talent in each of the places, like NMSS, for instance?

DR. STEINDLER: I'm a believer in part in the matrix system, and I believe that there is some advantage in having a coordinated critical mass of risk assessment people -- this is a little bit of a specialty -- altogether in one group; and that an organized method become available for each of their customers to draw on the services in some sort of orderly fashion, on the services of this risk assessment group.

I would not recommend that risk assessment people be scattered as individuals or perhaps in groups of two or three at the most throughout the rest of the structure of the licensing people. I'm a strong believer in a critical mass for that kind of talent.

DR. LAWROSKI: But that represents the extreme of zero versus solid one. I mean, I would like to know --

DR. STEINDLER: I see no disadvantage that cannot be overcome by sensible and fairly simple managerial techniques.

DR. LAWROSKI: It does mean, however, that the risk assessment group has to know the problems of all of NRC extremely intimately, I think, to do it.

DR. STEINDLER: It certainly has to know the problems as they relate to their assignments, but that's true anywhere. I don't believe that the risk assessment people, unless specifically --

DR. LAWROSKI: I know it's a specialty group. But a lot of other groups consider themselves specialties, too.

Jerry?

MR. RAY: May I comment on Dr. Steindler's comment? I'm in sympathy with Dr. Steindler's comment on a special technique capability. It's been my own experience in the utility industry, when we tried to indoctrinate the technical personnel, engineers and others, with the more widespread use of computers for analytical purposes, I found finally that the way to really break down the logjam was to get some training for the people who had the problems, not to program a computer to solve the problems so much as to understand what was going on and recognize, this is a potential way to analyze a problem.

So I think maybe you can maximize the benefit of the specialists group, such as the probability and risk analysis group, if some training were undertaken to indoctrinate the people in the various branches of NMSS or any other office of the NRC with that kind of technique, what it means and, let's say, what the major analytical considerations might be; not to train them to do it themselves. That's a mistake.

But to train them to use in the maximum sense; by all means, recognize the problems that they can take to the risk assessment people and explain to them in terms that they'll understand.

There's a communications problem here. And it worked beautifully in the idea of using computers for the solution of utility system engineering problems. And I think some of that might very well be in order.

DR. LAWROSKI: If you leave too much to risk assessment --

MR. RAY: They have an understanding of the jargon, at least, between the two groups. And I think maybe that might be a very good recommendation to implement right here in the report.

DR. LAWROSKI: Alex?

MR. GRENDON: That doesn't mean that you have people who do the probabilistic analysis in this section, merely that you educate everybody in the section to what kinds of problems can be directed to probabilistic analysis. The same thing worked at other places with respect to computers: McDonnell Lab, even, where only a few people were well-versed in the computer. But they have tried to educate others as to where they can call upon and what they can do to help them. And slowly people learn, well, this is something they can do for me, and they turn to them instead of working out

lengthy problems that lead nowhere.

MR. RAY: What I finally did was detach some people on a rotational basis for three months or five months or whatever was necessary, and hand them over to the computer people. He spent that three months with them. And then when he came back to his assignment, he understood the idea of utilization.

MR. GRENDON: That might not so work with this other, which is rather more complex.

MR. RAY: You'd have to have more people to work with.

MR. GRENDON: It's a more complex field to work with.

MR. RAY: But you could schedule some classes on Commission time, and they'd get paid to go to school to get some of the fundamentals.

DR. LAWROSKI: Alex?

MR. GRENDON: I have very little to say. I look for gaps. Is there something that isn't being covered that ought to be? I saw none.

I thought I saw some things that were excessive, myself, things that were being investigated too deeply. But as Marty pointed out, we don't know what user demand led to them. Somebody must have asked for something of that nature. Why, I couldn't see. But if they did, then the response --

DR. LAWROSKI: I think they did try to make an effort. I think that was the purpose. We heard more of that than we did of what we really need for other parts of the report.

MR. GRENDON: One little thing that troubled me This exchange between DOE and NRC about waste packaging troubles me in this respect. It seems to me a little bit of buck-passing between Martin and Myers, where they say, we think you should emphasize the package form, and they say, well, if you come along with your criteria then we would, but EPA and you have to come along with criteria. And then NRC says, well, we can't come along until EPA has done this. So everybody's buffeting it around.

Now, really, viewed from the outside, it is EPA's problem. They haven't told anybody what to do. And they're the starting point. So that means both NRC and DOE have to be content with interim criteria. And if DOE is going to use as an excuse for not developing this the fact that they aren't firm criteria, that's a mistake.

So this little exchange makes me somewhat unhappy by its incompleteness.

But as for the research program that I saw here, it seemed to be certainly complete coverage. I'll dismiss my charge that it might be excessive. I'll assume that it was all needed, and I find no fault with it.

DR. LAWROSKI: Dick?

DR. FOSTER: I, I guess, too, am hoping to hear a bit more about some sort of a game plan that was used in order to direct the research program, perhaps, of the future. But I think the fact that the research component itself has only a limited control over this was reinforced. We've come during the past two days perhaps to visualize the research group here -- and I don't make this in a derogatory fashion -- but something of an elegant job shop, if you will. As such, it offers not a full opportunity for easy prioritization of what has come into the shop, perhaps other than when the money gets tight and it's necessary to decide that somebody's work is going to have to get slipped.

It's quite obvious that some good progress has been made between the research folks and really their customers, So that there is a better realization between the two on what may be the most important. But I think we're still quite a ways away from being able to say, this is a plan by which we select the things that we're going to do.

e-14 I think it's more of the job shop sort of thing.

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One of the things in that regard that still bothers me --

DR. LAWROSKI: Excuse me. I want to carry that point a little further. Is this remark which you wish to make with respect to all three or four elements, the major parts that we heard -- namely, high-level waste management, low level, uranium tailings, and fuel cycle? Or does it apply more to some of them than it does to others that you've heard in the past two days?

DR. FOSTER: It applies to some of them more than the others. But I think the place where the overall current system is weakest is really in the high-level waste area, because at this particular time that's something which is entirely out in the future without something solid to hang onto, while something like uranium tailings or the low-level waste or something that's been around a while, the licensing operation folks have been working with, and so it's much easier for them to see a high-priority item and it's much easier having them see it, to have it in their research shop to work on.

Another part of the overall organizational arrangement that tends to bother me is still this one of long-term research. I think many of the things which I would be looking at relative to prioritization are something which is geared to something which is several years down the

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line, like five years. I realize that's going to be a proolem then, but that mechanism for such long-term planning doesn't exist, and, as such, you end up with research projects coming into research which take a long time to do, out they are for today's proolems.

Consequently, there is a horrible mismatch here between the time when the answers are needed and the time when the results are going to become availaole. Such a mismatch, in fact, that the problem may be solved by other means before the results ever come out.

One possiole way of tending to reduce that type of thing would be to perhaps set up some criteria or ground rules of what kinds of things we're going to come into the research group to do in the first place, some tests like the income tax people use to see whether you're going to be excluded from a particular exemption or something or other.

One of these obviously would be the thing which distinguishes between technical assistance and the research group. Another one would be whether it does have specific use for some rulemaking which is coming up or some guide that's coming up, where there is an obvious organizational need.

Another one would certainly be whether it's something that should be done by DOE. Whether it can be done and worked out is something else again. But relative

to DOE, I also think here that there is a need to establish some kind of criteria or ground rules of what kind of DOE results and reports it's proper for NRC to pick up and use relative to the things where it's not proper to use it because it gets involved with the need for independence.

I think we all recognize the need for NRC's independence in terms of its evaluation. To me, there isn't at all a clear distinction being made here as to where this cuts in versus what really DOE ought to be doing. And certainly, when the enabling legislation was set up in the first place, there was a major distinction which was made between the kinds of things which DOE was expected to do and the kinds of things that NRC research was expected to do, with a great difference in budgets.

Consequently, there must certainly be in here a thought that the hard work is going to be done by DOE and that NRC could use much of that information. So, I think it's essential, as a part of these ground rules to come to some sort of an understanding of what DOE really ought to be doing that we could use or avoid it perhaps or ---------- on the area of how you get DOE to do what NRC thinks it should.

DR. LAWROSKI: Frank.

DR. PARKER: I just have a complaint, first, Steve, before some suggestions on the research.

First, to really make substantive comments on the

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research. We just can't see a one-page sheet, two seconds before this discussion, in front of us. We need, really, to have in front of us much earlier if they want us to make substantial comments.

A lot of the documents apparently have been available for sometime. Certainly, what looks like the front sheet, from something like a 189, is available. Certainly, if they want us to discuss that, they ought to send it to us a month in advance so we could at least read it on the plane, if not before that.

With respect to the things that we did hear, though, I find there still seems to be too much emphasis on generic problems. In high-level wastes, for example, we are really dealing with maybe one or two repositories, at most, before the year 2000. And it seems to me that, instead of looking at shale in general, we ought to try to pinpoint where the repository is likely to be and what's the shale in that particular spot. The same thing is true with salt. But shale and salt -- the salt in Avery Island, for example, has no relationship to the salt at the WIPP site, even though they're doing experiments. I know they're doing experiments, even though it's DOE that seems to be doing it. NRC seems to be following the same path.

Also, it's not clear to me, when they ought to be looking for engineering bypasses to scientific problems,

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they're trying to find a scientific solution to a scientific problem. Frequently, there are ways to get around this.

Then, an example that they're going to wrestle with, one of the slides had brine migration of salt. If you keep the temperature low enough, you won't have to worry about the brine migration. They might want to make that as one of their criteria in salt disposal.

Looking further at the high-level waste, I think that there is overkill in some aspects. I think three in situ in-depth investigations on one site is just not reasonable. I think they ought to look at the cost effectiveness of that, and the cost benefit of so many investigations and what they really stand to gain. The rationales seem to me all political, all public-relations motivated, which is in support of what I say: It isn't we shouldn't pay attention to it, but you shouldn't have to have three places actually existing in the ground and say if one is right we will back on the others.

You designate and pilot holes in all three, investigate them to the full extent, and say if something goes wrong then we will go to one of these others. I just don't see the necessity.

Looking at low-level waste, I think I share some of the things that Martin said. Looking at the costs and benefits of some of these things, it seems to me worthwhile

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to look at what the costs and benefits are of having dispersed sites.

We've done some studies on this, and there is no question at all that, just from a cost point of view, you're much better off with a series of dispersed sites and you can show in fact in dollars that you can spend a lot more dollars improving a site or improving a package from the cost, you would say, from just shipping this junk around the country.

Again, with low-level waste, it seems to me that they're unaware of some of the realities that will take place, or at least that they may be aware of them but it wasn't expressed at this meeting. Talking about burial in arid sites and how they're perfectly safe there, that of course isn't the case at all, because it may be an arid site now but it's certainly going to be pluvial within the lifetime of the transuranics that are going to be buried in some of those sites.

You can practically guarantee, for example, that the Hanford 'te is going to have water running out of its ears 10, 15, or 20 thousand years in the future.

I would have liked, I guess, to have had more on mill tailings, but unfortunately I haven't read the GEIS. That's not their fault. But that's a document we should have had ahead of time. I would have had some more comments

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on that. I think that's an important item.

I guess I also would repeat that they ought to stop repeating state-of-the-art reviews unless they have something different to say. That should not be a question of whether it's scientifically correct or not. If it's done by competent people, then NRC ought to look at it. But unless they see obvious gaps or holes, it's not worthwhile to do the same thing over again.

DR. LAWROSKI: Schuyler.

DR. PHILBRICK: My feeling about this thing today and yesterday goes into several points. The first of it has to do with the waste packaging. I was concerned yesterday afternoon when I didn't find any criteria coming out, which is exactly the same situation we were in in October, last fall, when we were talking about repositories. Now repositories seem to have some sort of criteria, even though EPA hasn't given them any.

Now, the same thing applies to the waste packaging. Everybody's in agreement that they ought to have a thousand years of capability in the waste packaging in some way or another. That's apparent. So, let's proceed on the basis that we're going to design a package that's going to have a life of at least a thousand years. Then, let's utilize the industrial capabilities in the design and production of the waste packaging.

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These people have been doing this type of thing, producing something, making a profit at it, and staying in business — which means they have the capability. There's no reason why they can't do tha and do that faster than the laboratories that have been listed.

Now we get to the repository. There is no question it must be utterly reliable, which means that it has to be suostantially dry. Those relationships — water and rock — are discernible before anybody drills a whole lot of holes. Certain characteristics are pretty well established. The presence of salt makes that type of an environment an indication of a dry condition in certain parts of the stratographic column. Some areas are better than others. But when we get into that, we get into unfortunate conditions in the salt itself, and we get into unfortunate conditions which are socioconomic.

With particular respect to WIPP and with particular respect to the Salina Basin, there is no question it's going to be elsewhere. So, I have a feeling that the smart thing to do is to get away from those things, get into a situation where the United States has the control, and that is Hanford. Hanford is not entirely desirable, for a lot of reasons, but it's a hell of a lot more desiraole than a lot of other places. And in terms of water and pluvial situations in the future, the section of rock we're

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concerned with will have no adverse effect from a changing climate.

DR. PARKER: I was talking about low level.

DR. PHILBRICK: I know you were. I want to get this thing in, that the high-level waste at depth at Hanford, the storage there is not to be compared to low-level waste storage under pluvial conditions at Hanford.

When we get to Hanford, then there is a real value in serious consideration of a nickel-iron cannister, as designed in the proposal from Stone & Webster.

Now, let's get to the last two points. It is too long a time to construction. There is nothing particular about this procedure, th s excavation, and this development of a storage area underground, that cannot be handled rapidly. I mean, within a couple or three years. The design should be completed and the people should be going down in the shaft on a permanent basis.

The exact dimensions of the underground working are dependent upon conditions underground, and they can be established as construction proceeds.

Now, we get to the last thing. I have been very much pleased with the apparent increase in geologic and geotechnical capability that the NRC is showing. I was quite distressed when something came across and I had to

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write a letter such as I wrote sometime this summer because it was so apparent back in October that the NRC should increase their geologic and geotechnical capability tremendously.

I think they've done that. I think they're going in the right direction. Which means, then, the NRC should free these people to go to the field, see what needs to be done, to examine the data as it's collected, to look at the rocks, to go down the holes, to do all the necessary and proper things that one does in a geotechnical investigation. And they should have free access to the DOE staff and they should proceed right along.

My experience at Hanford the day that I was in the field out there was extraordinarily enlightening, and it was because I had an opportunity to be in the field with the fellow who had charge of the work, to spend some time with the contractor before I went in the field, to have seen the materials that were coming out, the borings. And in my experience, the only way a geotechnical engineer or an engineering geologist can function is to be free to be in the field, to be free to follow his need for knowledge whereever it leads in the organization, whether he crosses the channel lines, whether he goes through a channel or whatever.

That's all I have.

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DR. LAWROSKI: Anybody wish at this time to comment on what Schuyler has said? Maybe we can wait.

Sylvan.

MR. CROMER: I think everyone has said things that I have wanted to say, perhaps a little better than I have said them, with regard to cooperation between DOE and NRC. And I believe that this suggestion of actually handling this at the Commission level is probably a way that it can get straightened out.

One of the things, it seems to me, that NRC has a responsibility for is to determine whether or not any of the nuclear operations are actually hazardous as far as the public is concerned. They should determine the critical level.

Take, for instance, the tailings piles: In other words, what is the critical level of radon from tailings piles? They have set a proposed limit of two picocuries per square meter of tailings piles surface. We've been living with much higher levels than that for a good many years. As I believe you pointed out, the Canadians probably aren't doing anything like that, nor are other people in the world, trying to get those very low levels.

But it seems to me that we're really interested in what is behind this number. Is it something that we'd like to have, or is it actually something that is — excuse me —

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a real problem from the standpoint of the public.

Then it seems to me also that the development of how you achieve these levels is something that is really the responsibility of the contractor, the milling contractor. If we can say that we've got to meet this level, that DOE and the contractor have the problem of working out how — in other words, what do the pits look like and so forth and how to achieve that — then NRC's responsibility is to be able to have tests so that they can go out and make these measurements and say you are or you are not meeting these requirements.

Since I am talking about tailings, I do want to mention this proposal that they gave us. That is, the proposed licensing requirements for uranium mill tailings. This has been put up to industry for study, and two hearings will be held: one in Denver on October 1 and 2; and another one in Albuquerque a little bit later — October 18 and 19.

I understand that the milling industry are going in prepared with a lot of data, so we should get that one shaken down and in pretty good shape in those two meetings.

Another one that I was concerned with as we were talking about disposal on government land, I believe we were told that congressional action might be necessary. I am wondering if it isn't possible at a high level to work out about the same situation that the oil companies have used

for years in leasing. In other words, if an oil company comes in and I lease some land for two years to do any exploration that they need, it is understood that they have a right provided they can get that well producing in two years to operate that well just as long as they can get the oil or gas out of it.

It seems to me that the same thing has to be worked out on the use of government lands and that Congress should give NRC or DOE the right to go in and explore government lands or sites, and if they find a suitable site, they've automatically got the right then to go in and put a facility on it.

Going back to the oil well technology, of course, a standard lease form says that you can't put a well down within so many feet of my barn, and things like that. But these things should be worked out in this agreement.

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In other words, the thing that I'm concerned with is spending a lot of money developing a site on government lands and then having the Congress get together and say, no, no, this is no good. You can't put a disposal site in the area.

The other thing that I do believe, and a number of the problems that have been discussed such as plugging of holes and so forth, flow through porous media, such as flow through sands of gases and liquids through sands, it seems to me that this is something that has been understood in the petroleum industry for years and years. It comes in in so many phases of their work of production of oil or gas through sands, repressuring, water flooding, and so forth.

But certainly, this is a source that I believe that NRC and DOE, if they're not taking maximum advantage of, should take a look at.

DR. LANROSKI: Thank you. Let's open it up again. Don?

DR. ORTH: I'm not sure just exactly whose problem it is or how it enters into what we're doing, but I'll talk about it anyway. Maybe it's a variety of legal research, but that's on a continuing basis. I hope somebody's looking at what is really required to meet NEPA as it keeps evolving.

This specific example which we talked about yesterday and Schuyler brought up again, this business of exactly how

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many alternate sites do you have to have complete information for before you can do anything. All kinds of analyses were made to reactor siting in the rest of these things and it's an area that I think needs to be explored.

DR. LAWROSKI: Preparatory to deciding what research is to do?

MR. ORTH: I think it's a variety of legal research. It will also help in a sense --

DR. LAWROSKI: Marty?

DR. STEINDLER: You asked us to comment on other people's comments. Let me make a comment about the oil industry data. It may very well be that the oil industry has a lot of very good information on methodologies. There are two things that strike me in my very limited contact with oil industry data.

Number one, to pry it out of the oil industry takes more than the dynamite that is readily available. Number two, in some areas it isn't worth a damn for the kind of processes and the kind of technical justification that we have to use here, that is going to face us collectively in an open hearing.

So I think that there may well be an awful lot of information buried in the bowels of people's files. But I guess I despair of being able to find a good mechanism to get it out.

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My other point is that the comments you made regarding what ought to be the direction of the program, I think, are addressed to the wrong forum. Again, the guys who are leading the charge into the various areas of exploration are DOE.

I certainly have no quarrel with most of the frame of reference in which you say —

DR. LAWROSKI: Who's the "you"? I think it's Schuyler.

DR. STEINDLER: I think it's Schuyler. I have no quarrel with the kind of thing that your're proposing. I'll sometimes argue with you about the applicability of an iron nickel system in several kinds of brines that my people are talking about.

DR. PHILBRICK: I wouldn't even mess with it. I'd put it in maphic rocks.

DR. STEINDLER: Well —

DR. PHILBRICK: It's got a specific application of great value.

DR. STEINDLER: For that you absolutely insist on essentially zero humidity and anaerobic conditions. And I don't think that you can generate those. The thermodynamics are lousy for the iron nickel system is I guess what I'm saying. Although we had somebody get up from your staff, got up and said that it isn't clear that everybody agrees that the

thermodynamics is the determining factor in the staoility of a canister, out rather kinetics, I'm willing to buy that. I understand that pretty clearly.

DR. PHILBRICK: Maybe you ought to read the piece of paper I gave to Steve.

DR. STEINDLER: It would certainly be instructive to me, yes. But I think for the most part if we attack the method whereoy DOE is going about developing the nation's program, some of us were to cheer you on loudly because we've been convinced in various fashions that they're going in the wrong direction most of the time.

On the other hand, that's not an NRC problem. In that sense, I sense that NRC simply has to follow, the mission being presumably that DOE develops and then NRC licenses.

And if that's the case, then I think maybe we should figure out a mechanism whereby we can transmit Schuyler's comments to DOE.

DR. PHILBRICK: They've got them in a way. I mean I've published on this stuff and they've got the copies.

DR. STEINDLER: Let me make a couple of other comments.

I've been distressed, and I don't know whether it's a research function -- in fact, I'm sure that it isn't a research function; it's an NRC problem -- at this whole

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question of state veto that came up during the discussion of the WIPP site.

I happen to be of the persuasion that says to give the states veto power over federal actions of this kind is absurd.

Furthermore, because of the obvious pussyfooting that has to be done owing to the political sensitivity of this whole question, I think the inability to resolve that issue in a fairly timely fashion is causing a fair amount of problems for the people who are project managers in such various areas.

It's an issue that faces not only DOE at the WIPP site, but is certainly going to face NRC. And I don't see how it can help but be a primary problem in the case of Class 1 hazardous material disposal areas at EPA.

So there are several agencies who have got to confront this thing fairly quickly, and I don't know why somebody in the federal agency doesn't tackle the problem.

That's all for the time being.

DR. LAWROSKI: I haven't heard anyone say anything about the fact that they're worried about because of the moratorium on spent fuel processing, the NRC is having difficulties addressing questions in the fuel cycle, particularly.

And I think that it can't help but also affect what

can be done with the high level waste.

Until there is resumption of processing, we don't have any high level wastes except for the defense waste. And that's a DOE responsibility.

I was wondering whether you would have any comments about, for example, you'd think there should be some competence maintained in the NRC for the time when, say, spent fuel reprocessing would be resumed.

And the question of fuel cycle and waste management assume the proportions of problem size.

DR. FOSTER: Steve, in that regard, it's kind of interesting that NRC would focus on the primary reliance on waste form.

At this particular point, the waste form is only a spent fuel element. Really, I suppose that the form which needs the research is how you additionally package the spent fuel element and where to meet your criteria there, as contrasted with glass, or whatever you're doing.

DR. LAWROSKI: Any further comments?

DR. ORTH: We're not uninterested in the business of preserving fuel cycle licensing capability. The reason we haven't commented on it is that I think from what we saw of their programs, they are doing that, a fair amount of research on things directed that way.

We talked about it this morning.

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DR. LAWROSKI: I have a feeling, though, that the reason that they're not allowed to have more than a couple of people in the fuel cycle decision is that somebody has said, hey, there isn't much in the way of processing. Therefore, that's a good reason for —

DR. ORTH: But by the same token, Steve, I don't really think that there's a great deal of research that needs to be done, even if we were active in it right now, that isn't already being underway and maintained.

They may need some personnel to actually do the licensing, but that's a separate subject.

DR. LAWROSKI: The point I wish to make is that a few years ago when we were going through this, we noted, and I still see the same situation, a decided shortage of managerial people in some of the elements to carry out the licensing function plus staying abreast of what's going on in DOE because we and many other people are always asking, what do you know what's going on in DOE that you may be duplicating, or that you should be doing because they're not doing it, to be sure that the licensing questions are addressed?

I have one question to Frank. When you talked about low level wastes, what's your definition? At Hanford, when you talk about low level wastes, do you include high concentrations of transuranic elements as one form of low level

wastes?

DR. PARKER: We do.

DR. LANROSKI: Because that definition doesn't always obtain every place.

It's an ambiguity. That's part of the business, because otherwise, your remark —

DR. PARKER: That's right.

DR. STEINDLER: I wonder if I might comment on your concern —

The inability to maintain a cadre of competent licensing-oriented people in the fuel cycle area is a concern, but we haven't addressed it here for two reasons, I think. One is because this is a discussion of waste management research.

DR. LANROSKI: Excuse me. I just want to remind you, please remember that I asked earlier today to send in your comments, particularly those you feel would be a help to us in preparing the research reports, research review reports.

Bear that in mind that that's the reason that we're asking you for further comments.

I'm sorry, Marty, go ahead.

DR. STEINDLER: Number one, this is waste management. Number two, it's research. And our focus, therefore, has not been, is NRC adequately staffed in the event that —

Personally, as you well know, I share the concern

gsh
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that if we wait long enough, all the people who knew how to do something are either going to retire or are going to be dead.

Then there are growing instances in which that kind of situation has DOE facilities.

In the other area, the presence of the moratorium has, in fact, caused a fair number of interesting ripples to run through Congress. And I think it's no particular secret that the disagreements between the President and the Executive and Congress have been at least in part responsible for what I would consider to be the severe beating that both the DOE budget and the NRC budget are taking in the halls of Congress.

Some of us, perhaps overly paranoid, also believe that there is a reasonable effort being made in Congress to gradually phase out the whole nuclear program, and the easiest way to do that is to strangle the federal portion of it, of which NRC is one.

There is, I believe, absolutely nothing that we here can or should do in that regard except to exhort those portions of NRC, number one, to resist, if at all possible, and number two, to become a lot smarter in reorienting their programs so as to maintain critical viability where they're obviously necessary.

DR. LAWROSKI: Jerry, I should give you a chance.

ash DH

MR. RAY: I just have two observations.

In the two days that I have been sitting here, my background in waste management is zilch. So it's been a learning experience.

But I was very much impressed by the repeated, and at the end of the day Schuyler mentioned it, caution on the part of the members of your staff here by way of asking the question, well, why are you doing that when this industry has done it with its 25 years of experience over there and so on.

I wonder if there isn't some paydirt here that could be struck by way of summarizing suggestions of this nature and making sure that the NRC staff and possibly with their influence on DOE, could take a hard look at some of these areas where they may not be reinventing the wheel but replowing a field that doesn't need plowing.

The other point that I still feel about, and Dr. Philbrick brought this out, is the leisurely pace at which research is done. This is, in my view, as a citizen and a member of ACRS, this area of waste management is an area of criticality.

It's something that is behind the trauma that has persisted since the Three Mile Island incident. And all those people who go on record with articles or TV appearances or debates, public debates, against nuclear power

ash DH

or in favor of stopping it, as you say, there might be a ground movement from some of the Congressional people in this area, emphasize that we don't know what the hell to do with the waste and we've generated. But we're going to go on and continue generating it.

Well, of course they don't acknowledge the fact that the major portion of the waste that we have is not from a nuclear power program.

But nevertheless, they had in their mind the need for progress. And you don't see it.

I don't feel sitting here in these two days a sense of urgency on the part of any of these agencies in terms of a research program with an intent to get a result and get the show on the road, as you said several times.

Those are my reactions from an informed viewpoint.

DR. LAWROSKI: I would like to note that since 1977, they have intensively looked into this. But we know the rather sad state of affairs from a managerial standpoint in NRC. But I see heartening signs of the road towards improving that situation.

I think there's some ways to go. But I wish to commend them for the progress made, at least thus far, and I would hope that the pace is accelerated if possible.

I think the increased amount of coordination between various parts of the NRC I find particularly heartening.

gsh
DH

There's more compartmentalization for various reasons Much of that I see is crumbling, that compartmentalization, and I think that's a good thing.

I hope to the extent that it's permissible and still stay within the guidelines and avoid major conflicts of interest, that NRC and DOE can work to the best advantage for getting on with the solution to the problem of high level waste management, militailings, or the fuel cycle research problems.

I'd like to take this opportunity before I adjuorn to thank the various consultants who took time from their busy schedules to come here to this meeting. And once again, I want to take the opportunity to thank the NRC staff through Frank for their presentations.

And we look forward to the October 25th meeting, which will be where we get down close to the nitty gritty.

I realize that's a tough problem, but unless we have some better feeling than I think we do for how within the NRC priorities are set, that we would not be in the most advantageous position to comment on this program because in the long run, they are the ones that are involved with day-to-day.

And we can comment until hell freezes over. If we, in a vacuum, try to ascertain by ourselves what should be done, it won't be a very good result because I don't think

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even with as much time as we have devoted today and other days, that we can hope to be quite as familiar with the problems that they face in licensing and answering the people's questions upstairs and various other parties as they should be.

This is not to say that they haven't, but they we can hope that they will understand the user problem so that they can best utilize the NRC's research dollars.

DR. STEINDLER: For this October 25th, if I have it right, meeting, are you intending to rereview the existing research program structure now organized?

DR. LAWROSKI: No. I'm asking, Frank, to provide particular emphasis to inform us on what their priorities are and goals in a little crisper fashion than we've heard any part of on these decision units. And the user people, too.

I don't mean, when I say talk to Frank here --

MR. WHITE: We can show you how it all fits together.

DR. STEINDLER: That's what I was getting at.

DR. LAWROSKI: Well, I want them to.

DR. STEINDLER: In order to do an evaluation of whether or not the research program is appropriately organized in relation to the needs of the users and what I call the licensing people, we have to have a lot better, crisper idea

ash DH

of precisely what technical problems and how importantly each of them is viewed by the user. The kind of thing that Charley, one of the speakers put up there, had no information on the importance, and it was hard, therefore, to identify whether we were attacking a minor problem.

DR. LAWROSKI: This is one reason that we have to do as much of it as we can through a limited number of people in NRC.

We can't ask every one of the user groups to come in here in one day to do this. I think it behooves Frank, as well as possible to establish it.

DR. STEINDLER: I assume we're talking about fuel cycle and waste management.

DR. LAWROSKI: And uranium tailings. And low level wastes, yes.

DR. STEINDLER: Well, I, for one, would find it very helpful if we could get an identification of what the specific technical issues are that the licensing people face.

DR. LAWROSKI: You see, you keep saying licensing. But some of these darn things are done because of the people in standards.

Now they support the licensing, but the people in standards, though, are the ones who talk, I think, to Frank when something is done more than somebody in licensing.

Am I correct?

ash DH

DR. STEINDLER: I'm sorry, I'm using the term "licensing" in my own fashion. By licensing, I mean everybody except research and the technical assistance program.

DR. LAWROSKI: But it's people who talk to one another, not programs.

DR. STEINDLER: Correct.

MR. CROMER: I just wanted to add one thing to what Marty has brought up about the oil industry.

He is probably many years closer to it, the oil industry, than I was when I got in the nuclear business. But the thing that I am concerned with is the fundamental flow of liquids and gases through porous media.

30 years ago, or a little longer, it was pretty well understood not only gases and liquids, but mixtures of gases and liquids.

Now at that time the Bureau of Mines was working very, very closely with the oil companies. Most of that type of information was published, of course. It's very, very old.

And I would be surprised if it would not still be available. I do not know how close the Bureau of Mines is to the oil industries. Some of the statements that have been made that we don't know what the oil companies are doing, by George, 30 years ago the Bureau of Mines didn't know what the oil companies were doing. And they knew what the reserves

ash DH

were and they knew as much about it as the oil companies did.

DR. LAWROSKI: I'm going to hold you off. I want to give Mr. White or anyone of the other three gentlemen a chance to comment.

MR. WHITE: On that point, we just had a meeting with the Bureau of Mines. They're involved in a test facility near Rifle, Colorado to look at the oil shale. In fact, they had a shaft that's just been constructed. It's about three meters in diameter. It goes down 2800 feet and they build a room at the base of this and are doing some in situ testing.

It's very closely related to our site characterization. And we've been invited to go out there and look at that facility.

So there is still contact because that's an oil company cooperative. There is still communication between the Bureau of Mines and the NRC.

DR. LAWROSKI: Do you have any other comments you would like to make?

MR. WHITE: No. We would like to thank the ACRS.

DR. LAWROSKI: Frank, did you have anything further?

MR. WHITE: I would like to invite Schuyler to comment here.

DR. LAWROSKI: I leave it up to you to get in touch

gsh DH

with Schuyler to go to Rifle, who, in turn, can make arrangements through Peter to go there.

DR. LAWROSKI: Frank, I think you wanted to make a comment, after which we're going to adjourn.

MR. ARSENAULT: I was going to describe what I currently think might be a way for us to respond to the subcommittee's desires on October 25th, to see if that generates any negative reaction.

We'll be doing some more thinking about this ourselves. What I -- what we're going to try to do is to give you a better feeling for the value, importance, and urgency of the research projects. And I think that those encompass what we mean when we talk about priorities.

As I said, priorities are multi-dimensional.

In doing that, in the last two days, what we did was present the regulatory program and show the research program within it.

What we will do, in keeping with the Chairman's remarks of a moment ago, is to present the research program in a format that will allow the need for the research or the utilization of the results to be identified, and then address that in some narrative form.

Now the problem is, and I heard the legitimate complaint here, it's difficult for you to really understand what's going on if all you have in front of you is half a

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dozen lines or a brief paragraph.

But if you're going to really understand why, what, and when each project is going on, we're not going to do it in a one-day meeting.

So somehow we will do our best to condense the information down into those elements we think you need. I hope we'll hit the mark.

DR. LAWROSKI: To help you with that condensation, maybe Peter, you can furnish Frank a copy of this because this would indicate, for example, at least for some of the elements, this is one that has now been formulated into what would be the charts for the waste management -- some of the factors entering into establishing priorities.

For example, to help understand and characterize complex phenomena, the potential for reduction of risks. There's some that are non-applicable that include reactor safety.

Of course, this would include waste management safety, obviously, establish margins, and get some idea of the sensitivity and so forth.

MR. ARSENAULT: This would be a very helpful document.

DR. LAWROSKI: I don't know how this is doing to work out for the broad spectrum of all of NRC's research because we know there are various ways people try to establish

gsh
DH

priorities. There's some that were developed way back in RET, 1970.

Well, we heard one definition compelling NRC research. There are others.

MR. ARSENAULT: This will be a welcome guide. We won't hesitate to modify it if we feel that we have a context that would better deliver our message.

DR. LAWROSKI: Well, we're already passed our advertised hour of adjournment. Thank you, again, gentlemen. Jerry?

DR. ORTH: Has anybody going to tell us what we do with that thing you handed out?

DR. LAWROSKI: This? High, medium, low, or if it's not applicable.

DR. ORTH: Just fill it in.

DR. LAWROSKI: I'm sorry?

DR. ORTH: Just fill it in?

DR. LAWROSKI: Yes. You might want to fill it in. We'll have a duplicate form to be filled in after October because I would hope to take at least a partial cut at it at an outline for this chapter.

These are things that are going to have to be done by the end of December.

Anything further?

(No response.)

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(No response.)

DR. LAMROSKI: We are adjourned.

(Whereupon, at 3:50 p.m., the hearing was adjourned.)

e-16+17

ACRS REVIEW

OF

NUCLEAR REGULATORY RESEARCH PROGRAMS

IN SUPPORT OF THE

REGULATION OF FUEL CYCLE FACILITIES,

RADIOISOTOPE UTILIZATION AND TRANSPORTATION

DESCRIPTION OF TECHNICAL PROJECTS

ACRS BRIEFING

FUEL CYCLE CONFIRMATORY RESEARCH

AND

TECHNICAL ASSISTANCE PROJECTS

- INTRODUCTION: SAFER/RES INTERFACE WITH NMSS/FC.....Mr. Frank Arsenault
  Director
  Division of Safeguards
  Fuel Cycle and Environmental
  Research

  Office of Nuclear Regulatory
  Research

- SCOPE: NMSS FUEL CYCLE AND MATERIAL SAFETY ACTIVITIES.....Mr. Thomas F. Carter, Jr.
  Deputy Director, Division of
  Fuel Cycle and Material Safety

  Office of Nuclear Material Safety
  and Safeguards

- TECHNICAL ISSUES
- TECHNICAL ASSISTANCE/RESEARCH PROJECTS

SCOPE OF FUEL CYCLE AND MATERIAL SAFETY ACTIVITIES

- FUEL CYCLE LICENSING
- RADIOISOTOPE LICENSING
- TRANSPORTATION CERTIFICATION

FUEL CYCLE & MATERIAL SAFETY LICENSING REGULATIONS MATRIX

TITLE 10 ENERGY CODE OF FEDERAL REGULATIONS

FACILITIES	Licensing Source Nuclear Material 10 CFR Part 40	National Environmental Policy Act of 1969 NEPA 10 CFR Part 51	Standards Protection Against Radiation 10 CFR Part 20	Licensing Production & Utilization Facilities 10 CFR Part 50	Licensing Special Nuclear Material 10 CFR Part 70	Certification Packaging Radioactive Material For Transport & Transportation 10 CFR Part 71	Licensing Independent Spent Fuel Storage Installation 10 CFR Part 72
Conversion UF_6 Production	X	X	X				
Enrichment		X	X	X			
Fuel Processing, Fabrication & Scrap Recovery		X	X		X		
Spent Fuel Storage		X	X	X	X		
Transportation						X	
Independent Spent Fuel Storage Installation (ISFSI)		X	X				X .

*Status: Regulation Targeted For Issuance End Of Calendar Year CY 1979

RADIOISOTOPE LICENSING REGULATIONS MATRIX

TITLE 10 ENERGY CODE OF FEDERAL REGULATIONS

CATEGORY	STANDARDS PROTECTION AGAINST RADIATION	RULES OF GENERAL APPLICABILITY TO LICENSING BY-PRODUCT MAT'L.	SPECIFIC LICENSES BROAD SCOPE FOR BY-PRODUCT MATERIAL	LICENSES FOR RADIO-GRAPHY ETC.	HUMAN USES OF BY-PRO-DUCT MAT'L.	LICENSES FOR SOURCE MAT'L.	NAT. ENV. POLICY ACT OF 1969 NEPA	LICENSING SPECIAL NUCLEAR MATERIAL
	10CFR20	10CFR30	10CFR33	10CFR34	10CFR35	10CFR40	10CFR51	10CFR70
ACADEMIC	X	X				X		X
MEDICAL (PRACTICE)	X	X			X			
MEDICAL (DISTRIBUTION)		X						
WELL LOGGING	X	X						X
OTHER MEASURING SYSTEM	X	X						
RADIOGRAPHY	X	X		X		X		
NUCLEAR LAUNDRY	X	X				X	X	X
R&D	X		X			X	X	X
IRRADIATOR	X	X				X		
PROCESSING BY-PRODUCT MAT'L. FOR DIST. TO OTHER LICENSES	X	X					X	
PROCESSING OF SOURCE MATERIAL FOR EXT. OF RE'S AND OTHER METALS*	X					X	X	
TESTING OF DEPLETED U MILITARY MUNITIONS	X					X	X	

*EXCEPT FOR URANIUM

FUEL CYCLE LICENSING

SCOPE: COMMERCIAL FUEL FABRICATION, ENRICHMENT, REPROCESSING, INTERIM SPENT FUEL STORAGE (AFR) AND ON-SITE WASTE STORAGE

ACTIVITIES: LICENSING REVIEWS (INCLUDING NEPA), STANDARDS DEVELOPMENT, GENERIC EIS

TECHNICAL ISSUES:

- ENVIRONMENTAL-SITING, 40CFR190, CLEAN AIR ACT, AND ALARA
- OCCUPATIONAL ALARA
- DECOMMISSIONING
- ALTERNATIVE FUEL CYCLE

FUEL CYCLE LICENSING

TECHNICAL ISSUE: ENVIRONMENTAL - SITING, 40 CFR 190, CLEAN AIR ACT AND ALARA

TECHNICAL PROJECTS:

- NATURAL PHENOMENA (NMSS)
- COST BENEFIT F. C. COST MODEL (NMSS)
- TABLE S-3 UPDATE (NMSS)
- SAFETY AND ENVIRONMENTAL ASSESSMENT (NMSS)
- HEPA FILTER TEST AND PERFORMANCE (RES)
- ACCIDENT AEROSOL BEHAVIOR (RES)
- NOBLE GAS RETENTION RISK STUDIES (RES)
- FUEL CYCLE FACILITY ACCIDENT SURVEY (SD)
- SOLUBILITY OF FUEL CYCLE AEROSOLS (SD)

FUEL CYCLE LICENSING

TECHNICAL ISSUE: OCCUPATIONAL ARA

TECHNICAL PROJECTS:

AEROSOL INHALATION TOXICOLOGY STUDIES (RES)

INHALATION TOXICOLOGY (RES)

RESPIRATOR TEST AND ASSESSMENT (RES)

RESPIRATORY CRITERIA, TEST METHODS (RES)

SOLUBILITY OF YELLOW CAKE (RES)

SOLUBILITY OF U FLUORIDES (RES)

CRITICALITY SAFETY STUDIES (RES)

TESTING OF HP INSTRUMENTS (SD)

RESPIRATORY PROTECTION STUDIES (SD)

INTERNAL DOSIMETRY - ICRP METHODOLOGY (SD)

DOSE EQUIVALENT INDEX CONFIRMATION (SD)

NEUTRON CALIBRATION SOURCE DEVELOPMENT (SD)

PERFORMANCE TESTING - PERSONNEL DOSIMETRY (SD)

8

FUEL CYCLE LICENSING

TECHNICAL ISSUE: DECOMMISSIONING

TECHNICAL PROJECTS:

- PHYSICAL CHARACTERIZATION OF WASTES AND TANKS AT WEST VALLEY (NMSS)
- RADIOLOGICAL EVALUATION OF CONTAMINATED SITES (NMSS)
- SAFETY AND COSTS OF DECOMMISSIONING FUEL CYCLE FACILITIES (SD)
- GENERIC ENVIRONMENTAL IMPACT STATEMENT - DECOMMISSIONING (SD)

FUEL CYCLE LICENSING

TECHNICAL ISSUE: ALTERNATIVE FUEL CYCLE

TECHNICAL PROJECTS:

- STUDY REGULATORY DIFFERENCES BETWEEN THORIUM FUEL CYCLES AND CURRENT URANIUM FUEL CYCLES (NMSS)

RADIOISOTOPE LICENSING

<u>SCOPE:</u> MANUFACTURE AND USE OF RADIOISOTOPES IN MEDICINE, RESEARCH, INDUSTRY, AND CONSUMER PRODUCTS

<u>ACTIVITIES:</u> LICENSING, STANDARDS DEVELOPMENT, AGREEMENT STATE PROGRAM SUPPORT

<u>TECHNICAL ISSUES:</u>

- ENVIRONMENTAL - SITING, ALARA, CLEAN AIR ACT
- ENVIRONMENTAL IMPACTS - CONSUMER PRODUCTS
- OCCUPATIONAL SAFETY
- FACILITY DECOMMISSIONING

RADIOISOTOPE LICENSING

TECHNICAL ISSUE: ENVIRONMENTAL - SITING, ALARA, CLEAN AIR ACT

TECHNICAL PROJECTS:

- ALARA FOR RADIOPHARMACEUTICAL MANUFACTURERS (EFFLUENTS) (NMSS)
- PERFORM H-3 ANALYSES OF BIOASSAY AND SAMPLES (ARIZONA) (NMSS)
- ALARA FOR MEDICAL INSTITUTIONS (PROPOSED) (SD)

RADIOISOTOPE LICENSING

TECHNICAL ISSUE: ENVIRONMENTAL IMPACTS - CONSUMER PRODUCTS

TECHNICAL PROJECT:

- STUDY TO SUPPORT GENERIC IMPACT STATEMENT ON USE OF RADIOISOTOPES IN CONSUMER PRODUCTS (NMSS)

RADIOISOTOPE LICENSING

TECHNICAL ISSUE: OCCUPATIONAL SAFETY

TECHNICAL PROJECTS:

- SEALED SOURCE PROTECTION (NMSS)
- DEVELOPMENT OF BIOASSAY METHODS FOR PM-147 (SD)
- SOLUBILITY INHALATION TOXICOLOGY, AND DOSE CONVERSION STUDIES (RES, SD)

RADIOISOTOPE LICENSING

TECHNICAL ISSUE: FACILITY DECOMMISSIONING

TECHNICAL PROJECTS:

- EVALUATION OF 10 CFR PART 30 DOCKET FILES OF TERMINATED LICENSES (NMSS)
- MONITORING FOR COMPLIANCE WITH DECOMMISSIONING CRITERIA (SD)

TRANSPORTATION CERTIFICATION

SCOPE: CERTIFICATION OF PACKAGING FOR RADIOACTIVE MATERIALS

ACTIVITIES: THERMAL CRITICALITY, SHIELDING AND STRUCTURAL ANALYSIS OF SHIPPING SYSTEM DESIGNS FOR COMPLIANCE WITH 10 CFR 71; STANDARDS FOR PACKAGE DESIGN AND WORKER PROTECTION

TECHNICAL ISSUE:

- INCREASE PROTECTION OF PUBLIC HEALTH AND SAFETY

TRANSPORTATION CERTIFICATION

TECHNICAL ISSUE: INCREASE PROTECTION OF PUBLIC HEALTH AND SAFETY

TECHNICAL PROJECTS:

- IMPROVE PACKAGE DESIGNS FOR LSA AND TYPE A PACKAGES (NMSS)
- IMPROVE ANALYTICAL TECHNIQUES (NMSS, RES)
- MODAL STUDY (RES)

PLANNED PROJECTS

- RADIOLOGICAL & CONTINGENCY PLANNING AND INCIDENT RESPONSE
  - -- MODELING OF VITAL SAFETY SYSTEMS IN FUEL CYCLE FACILITIES.
  - -- EXAMINE CURRENT EMERGENCY PLANNING AND RESPONSE CAPABILITY FOR FUEL CYCLE FACILITIES.
- RADIOISOTOPE LICENSING
  - -- ESTABLISH ALARA FOR EFFLUENT RELEASES FROM BY-PRODUCT FACILITIES.

THE WASTE ISOLATION PILOT PLANT

PRESENTED BY

MR. EUGENE F. BECKETT

U. S. DEPARTMENT OF ENERGY

BEFORE THE

ADVISORY COMMITTEE ON REACTOR SAFETY

SEPTEMBER 19, 1979

WIPP ISSUES

MISSION
LICENSING
PUBLIC ACCEPTANCE
STATE CONCURRENCE
RESOURCES
TRANSPORTATION

EXISTING NUCLEAR WASTE

	DEFENSE	COMMERCIAL
LOW LEVEL WASTE CUBIC FEET	50,800,000	15,800,000
HIGH LEVEL WASTE	9,400,000	80,000
TRANSURANIC WASTE KG CONTAINED TRU	1,100	123
UNREPROCESSED COMMERCIAL SPENT FUEL - MT HEAVY METAL		2,300
URANIUM MILL TAILINGS	140 MILLION TONS	

995 253

(1)

TRU WASTE AT DOE STORAGE SITES

VOLUME (THOUSANDS OF CUBIC FEET)

SITE	BURIED 10/1/77	BURIED 10/1/86	CH WASTE--STORED 10/1/77	CH WASTE--STORED 10/1/86	RH WASTE--STORED 10/1/77	RH WASTE--STORED 10/1/86
LASL	580	580	54	249	0	9
PANTEX	1	1	0	0	0	0
ORNL	215	222	10	32	27	52
HANFORD	5483	5483	247	855	3	8
INEL	2102	2102	1202	2376	0+	20
NTS	0	0	6	39	0	0
SRP	1085	1085	56	109	0	0
TOTAL	9466	9473	1575	3664	30	89

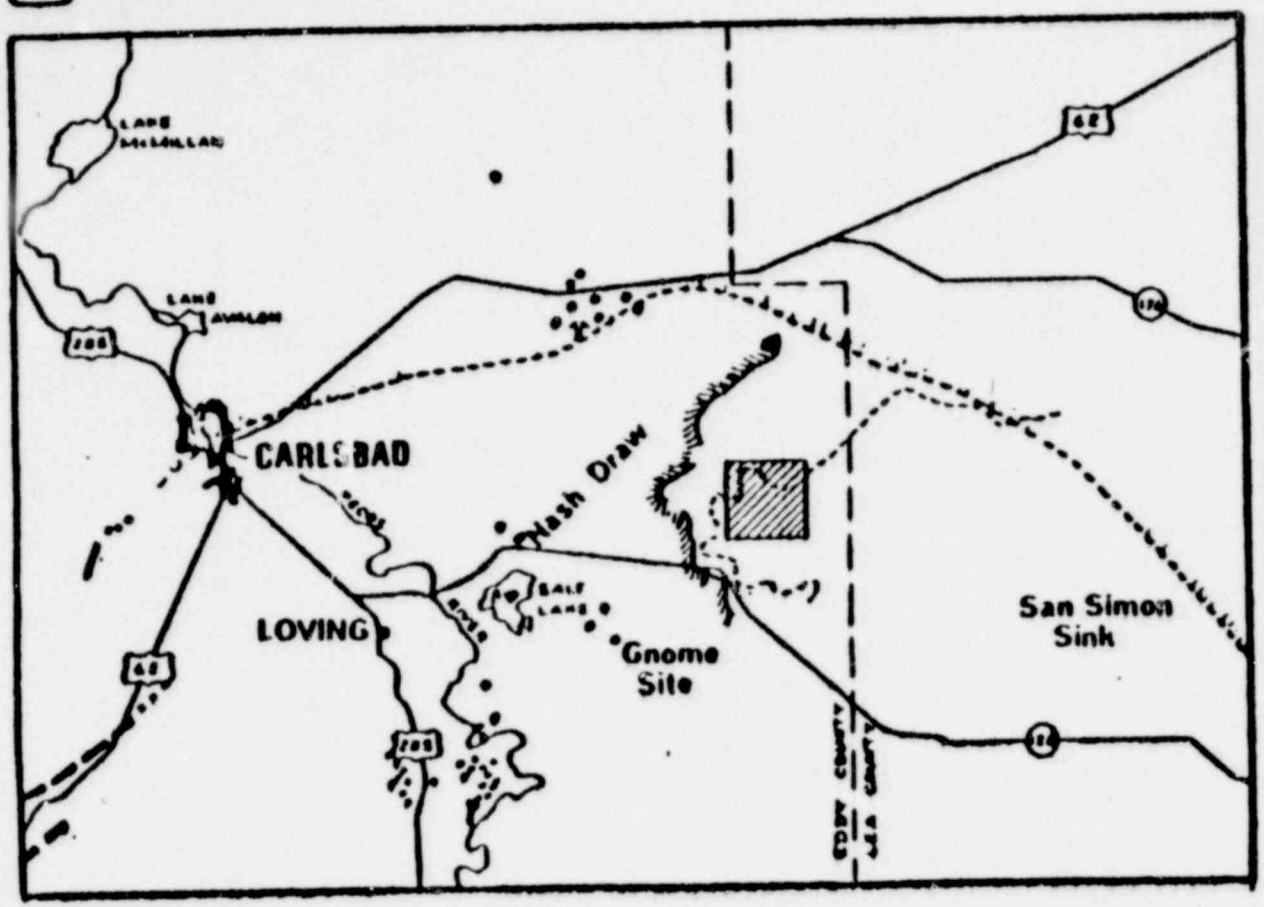
WIPP

PROJECT OBJECTIVES

- PERMANENT DISPOSAL OF DEFENSE-GENERATED TRANSURANIUM (TRU)
- TEST CAPABILITY FOR HIGH-LEVEL WASTE EXPERIMENTS
- RECOMMENDED DEMONSTRATION OF UP TO 1,000 SPENT FUEL ASSEMBLIES

MARCH, '77

Sandia Laboratories



- DOMES OR CIRCULAR STRUCTURES
- POSTULATED FAULTS
- PAVED ROAD
- CAPITAN REEF
- DISSOLUTION FRONT
- POTASH ENCLAVE
- STUDY AREA

0 10 20 Miles

0 10 20 30 Kilometers

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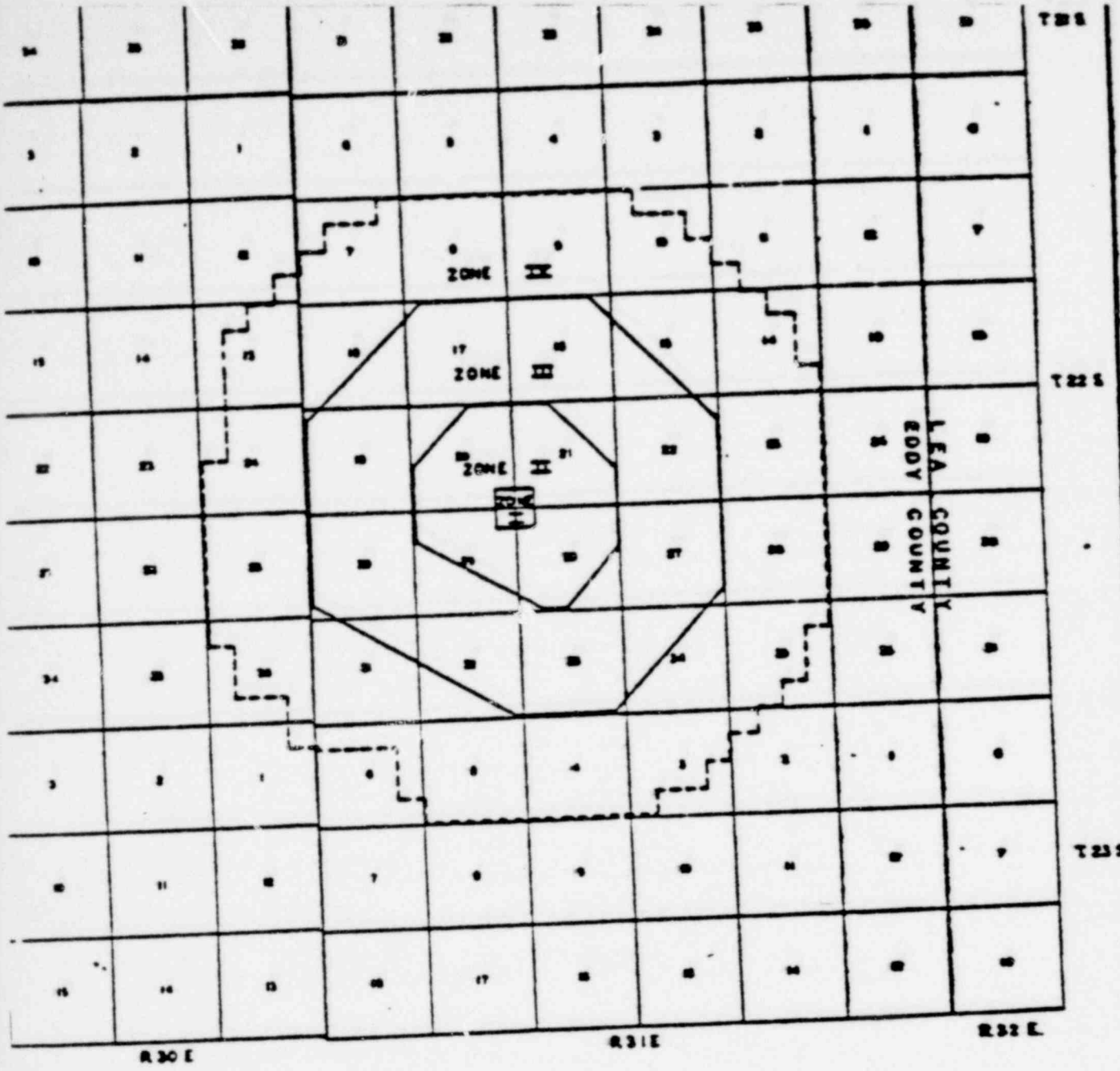
6



ZONE ACREAGE

ZONE I - 60-100

ZONE II - 1860

ZONE III - 6230

ZONE IV - ~~10,810~~

1 0 1 2 3

SCALE IN MILES

WIPP SITE ZONATION

WASTE ISOLATION PILOT PLANT

DESCRIPTION OF MAP ZONES

ZONE I — AREA OF SURFACE BUILDINGS AND FACILITIES

- RESTRICTED AND SECURITY FENCED AREA

ZONE II — MAXIMUM AREA FOR UNDERGROUND MINED DEVELOPMENT

- NO DRILLING OR MINING ACTIVITIES
- CURRENT LIVESTOCK GRAZING TO CONTINUE
- FUTURE ACTIVITIES CONSIDERED ON BASIS OF SAFETY AND GEOLOGIC IMPACT BY WIPP AUTHORITY

ZONE III — "STAY OUT" BUFFER ZONE

- NO DRILLING OR MINING ACTIVITIES
- CURRENT LIVESTOCK GRAZING ACTIVITIES TO CONTINUE
- LIKE ZONE II, FUTURE ACTIVITIES SUBJECT TO APPROVAL AND REGULATIONS OF WIPP AUTHORITIES.

ZONE IV — CONTROLLED ZONE

- NO SOLUTION MINING
- NO OIL AND GAS OR OTHER HYDROCARBON RECOVERY BY FLOODING OR HYDRO-FRACTURING TYPE TECHNIQUES
- FUTURE PROPOSED DRILLING AND MINING CONSIDERED BY WIPP UNDER WIPP APPROVED METHODS
- CURRENT LIVESTOCK GRAZING ACTIVITIES CONTINUE
- OTHER FUTURE ACTIVITIES SUBJECT TO APPROVAL BY WIPP AUTHORITIES

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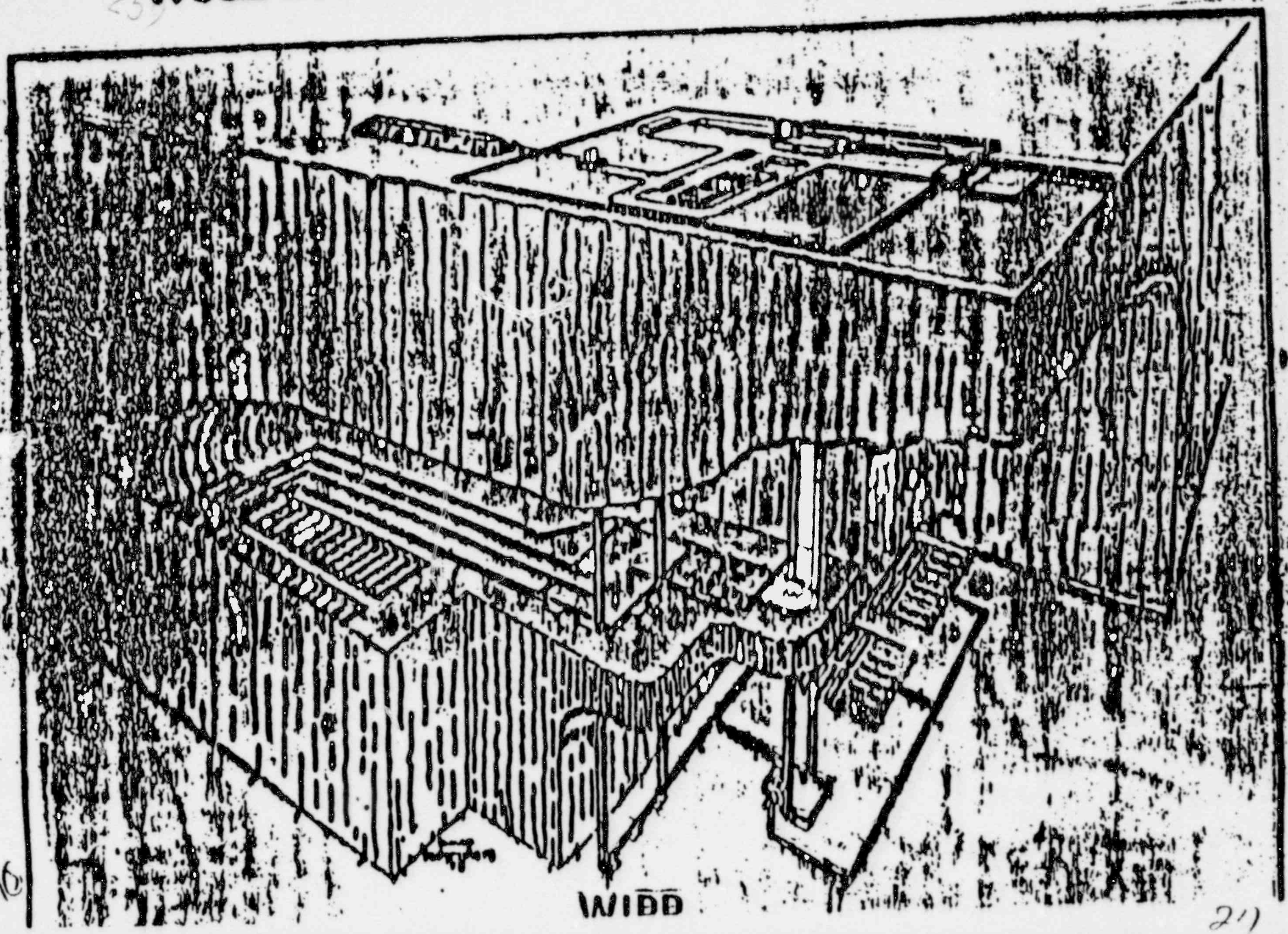
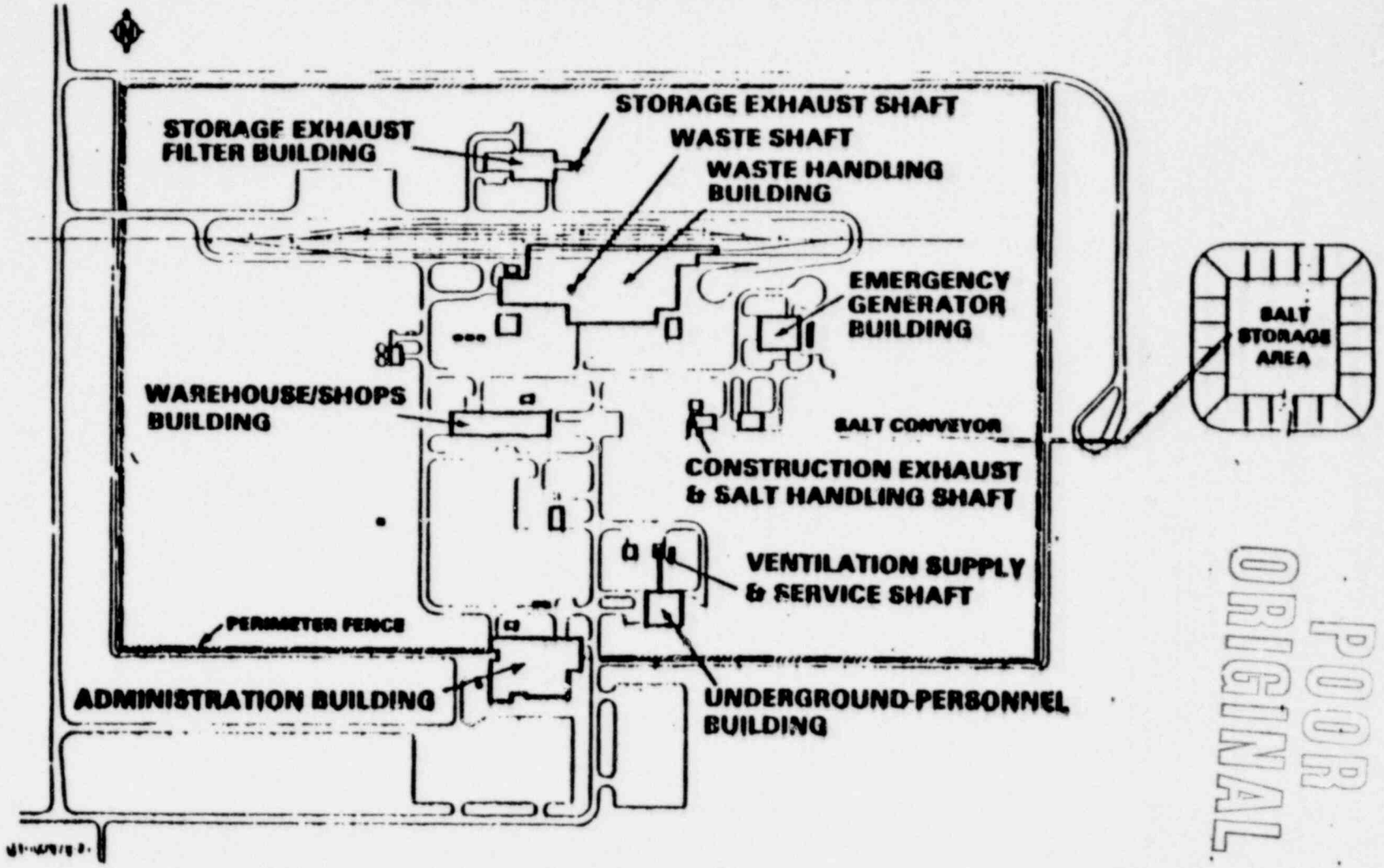
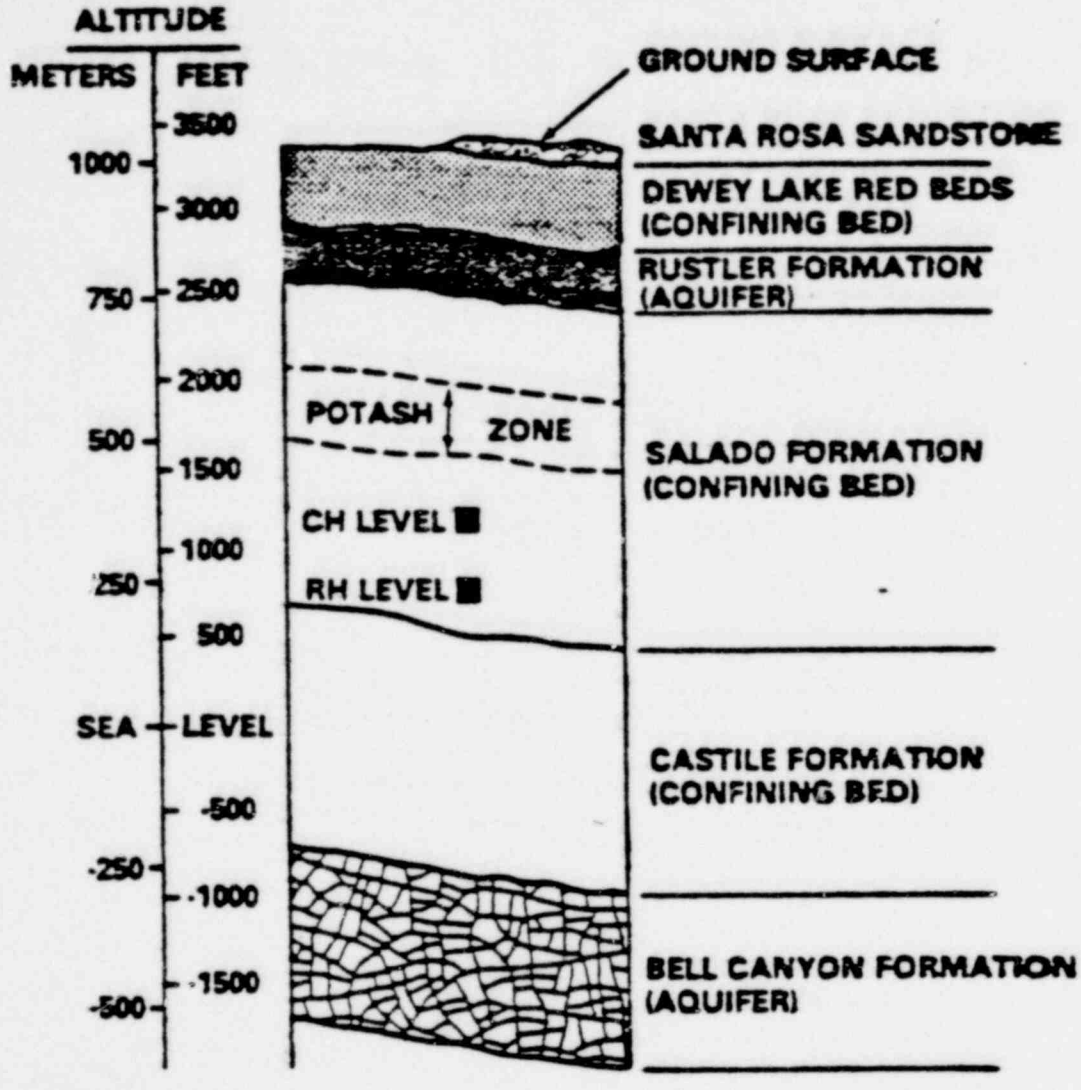
WASTE ISOLATION PILOT PLANT



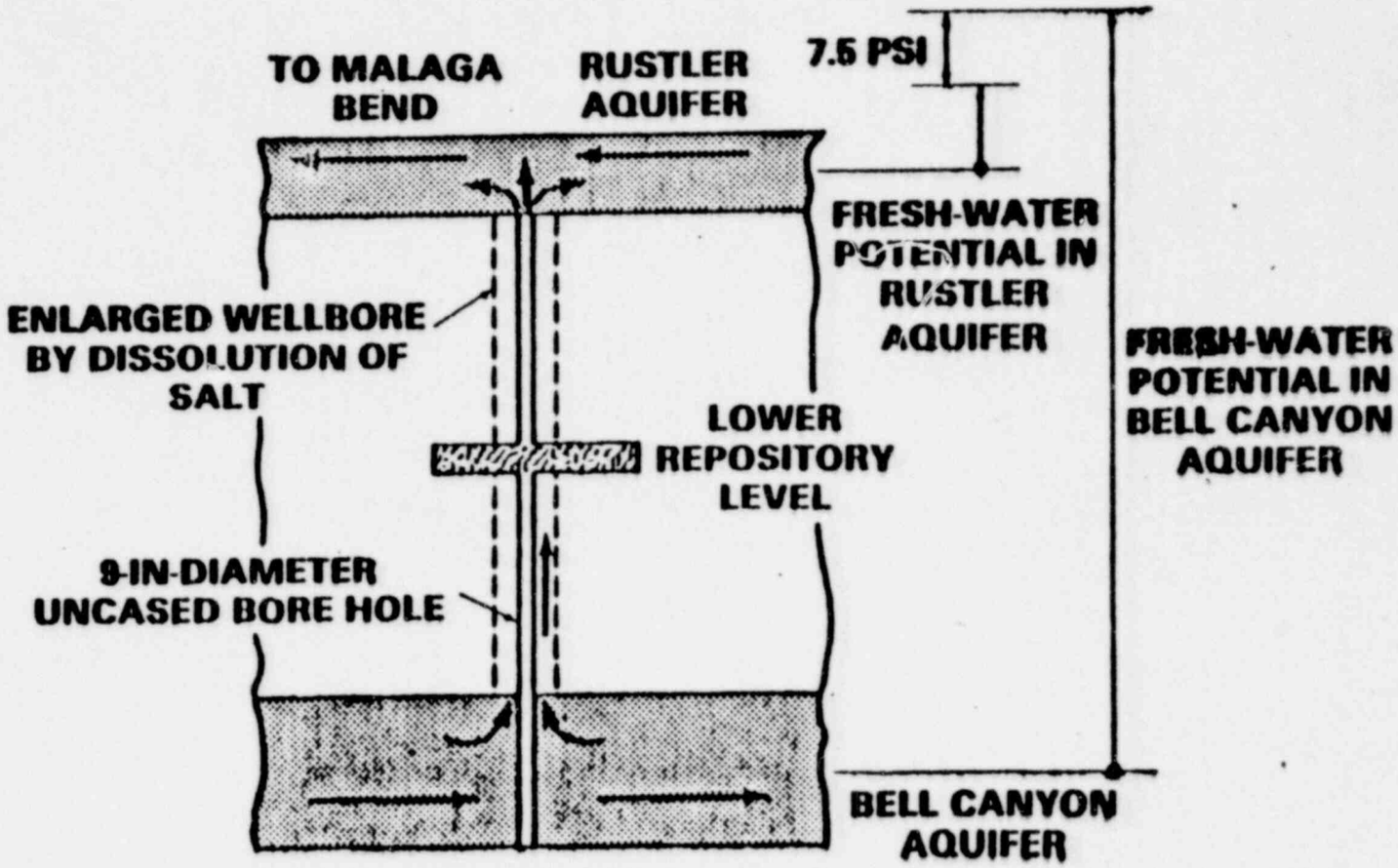
WIPP SURFACE FACILITIES



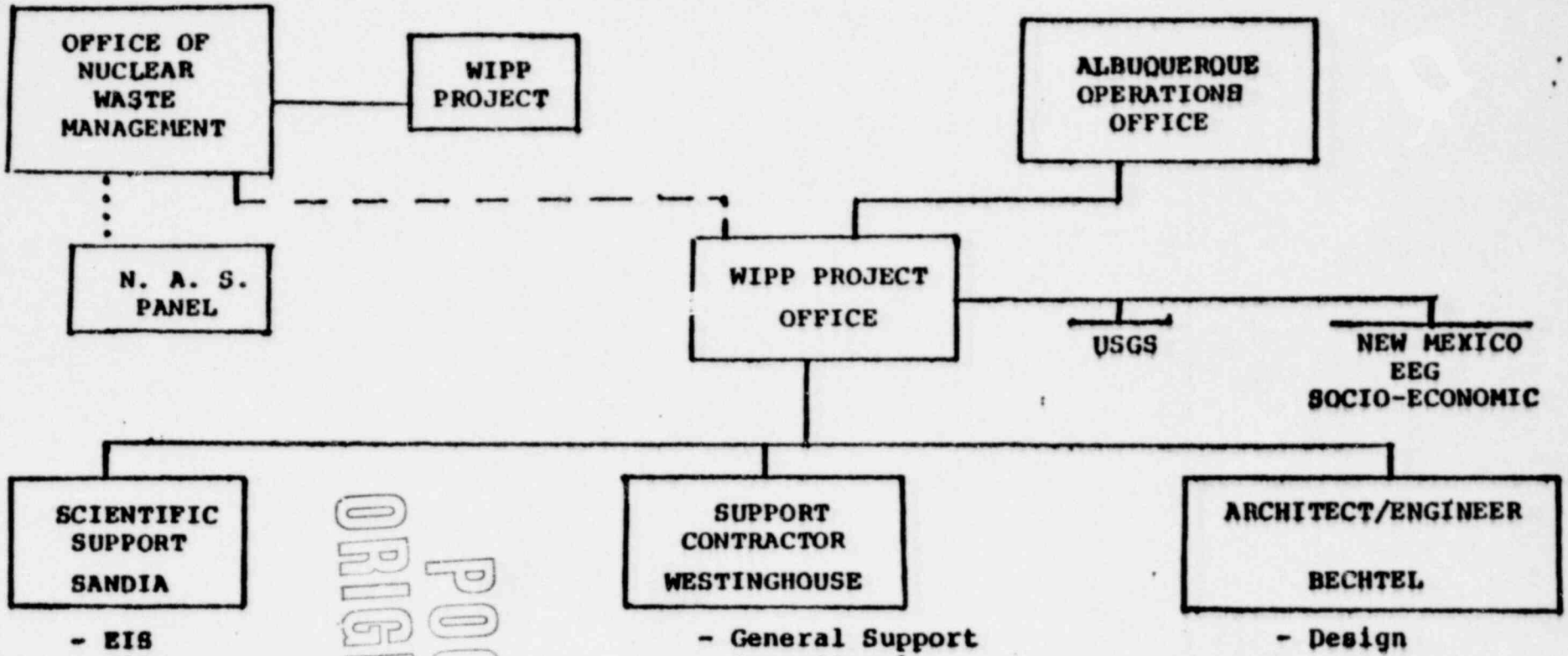
SCHEMATIC REPRESENTATION OF THE WIPP SITE STRATIGRAPHY



SCHEMATIC REPRESENTATION OF COMMUNICATION EVENT I



DOE WIPP ORGANIZATION



- EIS
- Site
- R&D

- General Support
- Operational Planning

- Design

TECHNICAL ISSUES FOR WIPP
RESEARCH AND DEVELOPMENT PROGRAM

WASTE INTERACTION

TRU DEGRADATION AND GAS GENERATION

HLW AND CANISTER DEGRADATION

ROCK RESPONSE

ROOM CLOSURE AND RETRIEVABILITY

CANISTER MOTION

DEFORMATION OF OVERLYING FORMATIONS

REPOSITORY SEALING

PERMEABILITY

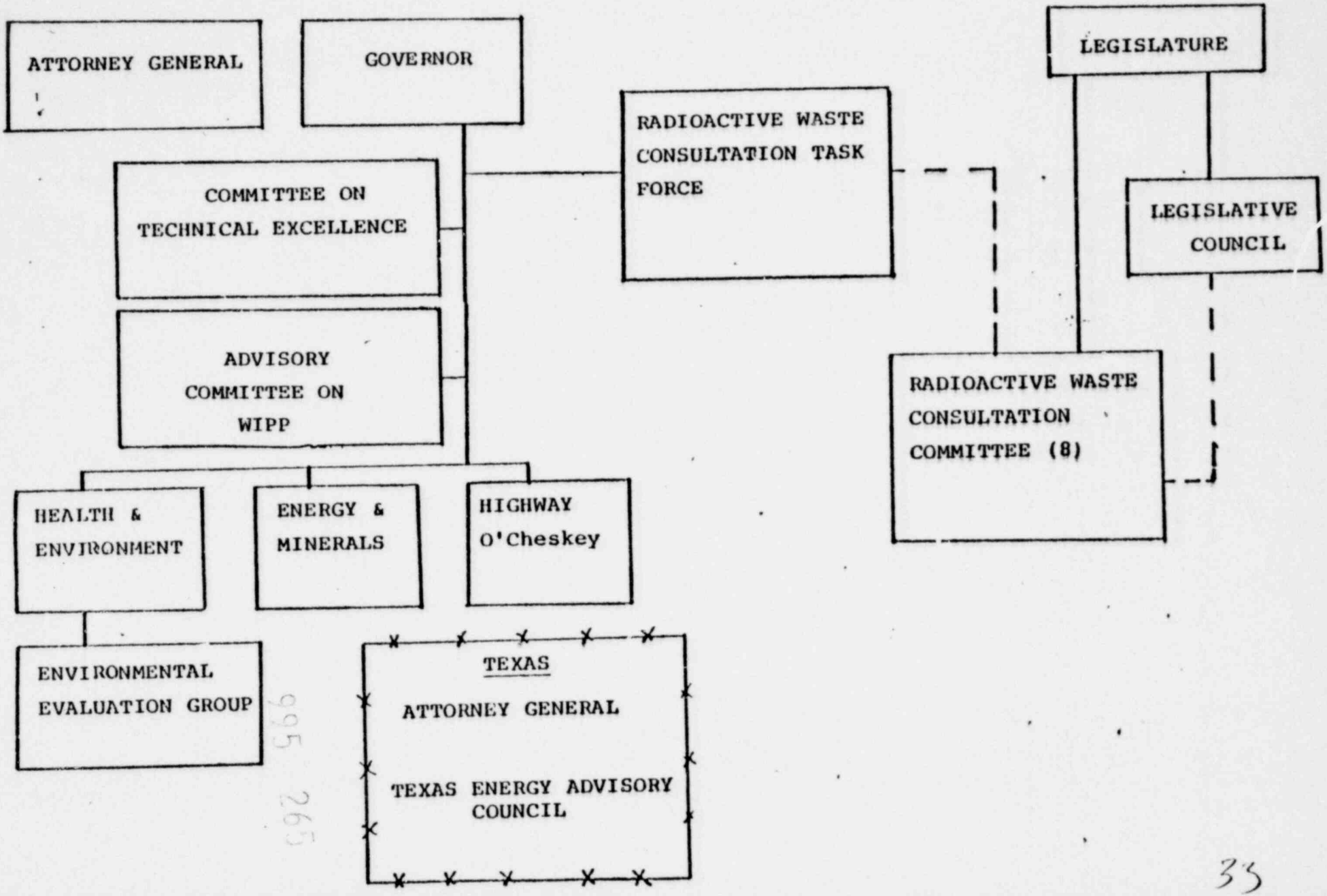
FLUID MIGRATION

BOREHOLE AND SHAFT SEALING

RADIONUCLIDE MIGRATION

REPOSITORY DESIGN AND OPERATION

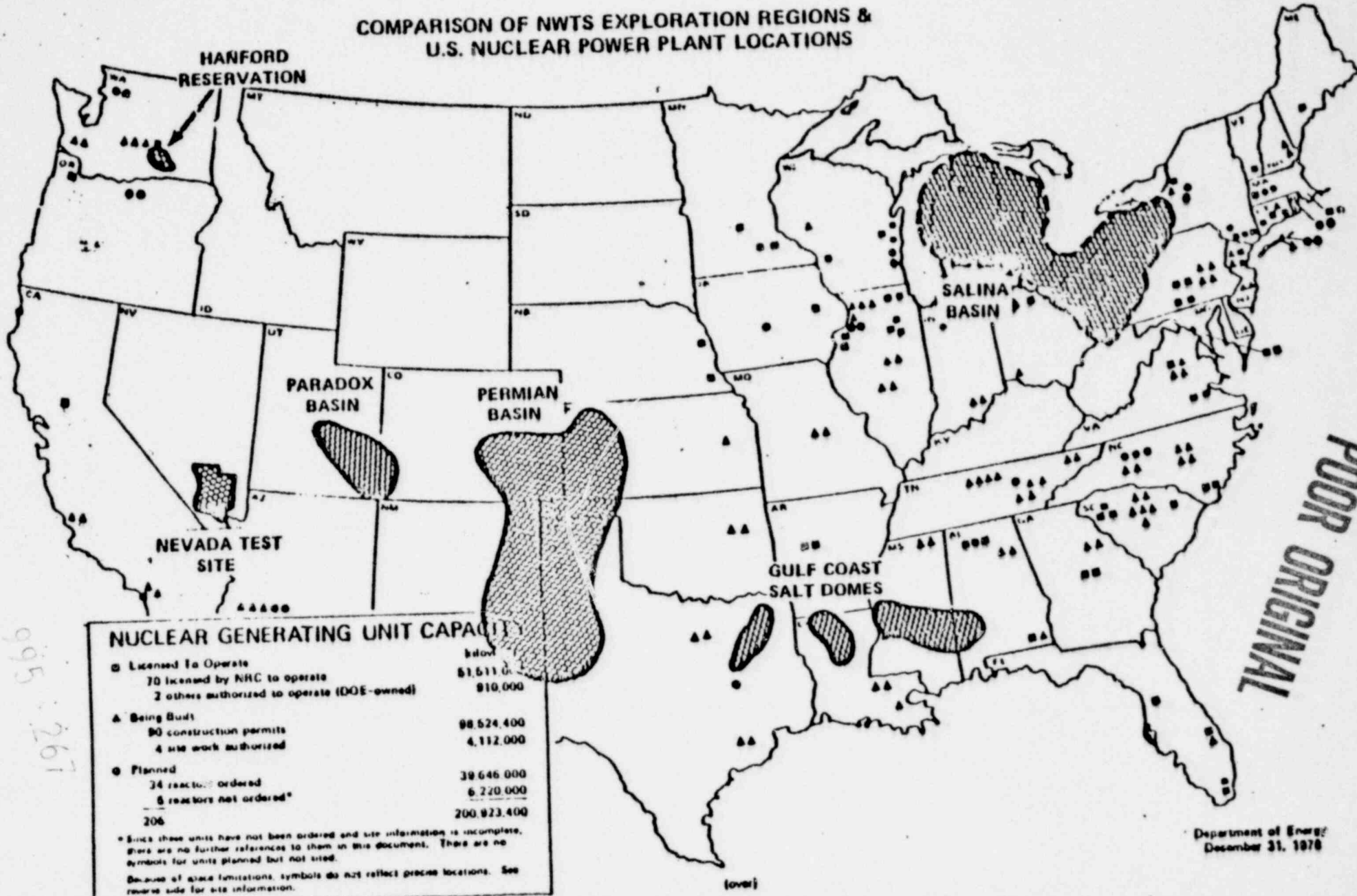
NEW MEXICO - WIPP COORDINATION



NATIONAL WASTE TERMINAL STORAGE PROGRAM
SUMMARY DEVELOPMENTS SINCE APRIL 1979

- PUBLIC HEARINGS ON THE DRAFT GEIS
- CONTINUED AND EXPANDED FIELD EXPLORATION FOR SITES
- NEAR-COMPLETION, SECOND DRAFT, EARTH SCIENCES TECHNICAL PLAN
- EXPANDED ALTERNATE WASTE FORMS RESEARCH
- RECONNAISSANCE SURVEYS FOR GRANITIC ROCK AND ARGILLITE FORMATIONS ARE UNDERWAY
- INITIATED STUDIES OF ALTERNATIVES TO SHALLOW LAND BURIAL (LLW)
- COMPLETED MINE CONSTRUCTION FOR TEST FACILITIES IN GRANITE (NTS) AND BASALT (HARFORD)
- PROGRESS MADE IN ORDERLY DELIBERATION OF ISSUES WITH STATES--FOREMOST BEING MISSISSIPPI, TEXAS AND UTAH
- BRINE MIGRITION TEST INITIATED AT AVERY ISLAND
- BELL CANYON BOREHOLE PLUGGING TEST INITIATED
- REMEDIAL ACTION PROGRAM ESTABLISHED
- THREE DRAFT EIS'S ISSUED IN SPENT FUEL STORAGE
- STARTED DEVELOPMENT OF NEPA IMPLEMENTATION PLAN
- INTERNALLY APPROVED DOE PUBLIC INFORMATION PLAN
- CONTINUED PUBLIC MEETING EXCHANGES WITH U.S. NUCLEAR REGULATORY COMMISSION

COMPARISON OF NWTS EXPLORATION REGIONS & U.S. NUCLEAR POWER PLANT LOCATIONS



NUCLEAR GENERATING UNIT CAPACITY

■ Licensed To Operate		
70 licensed by NRC to operate		$1,611,0[illegible]
2 others authorized to operate (DOE-owned)		810,000
▲ Being Built		
90 construction permits		98,524,400
4 site work authorized		4,112,000
● Planned		
34 reactors ordered		39,646,000
6 reactors not ordered*		6,220,000
206		200,923,400

* Since these units have not been ordered and site information is incomplete, there are no further references to them in this document. There are no symbols for units planned but not sited.

Because of space limitations, symbols do not reflect precise locations. See reverse side for site information.

(over)

Department of Energy
December 31, 1978

POOR ORIGINAL

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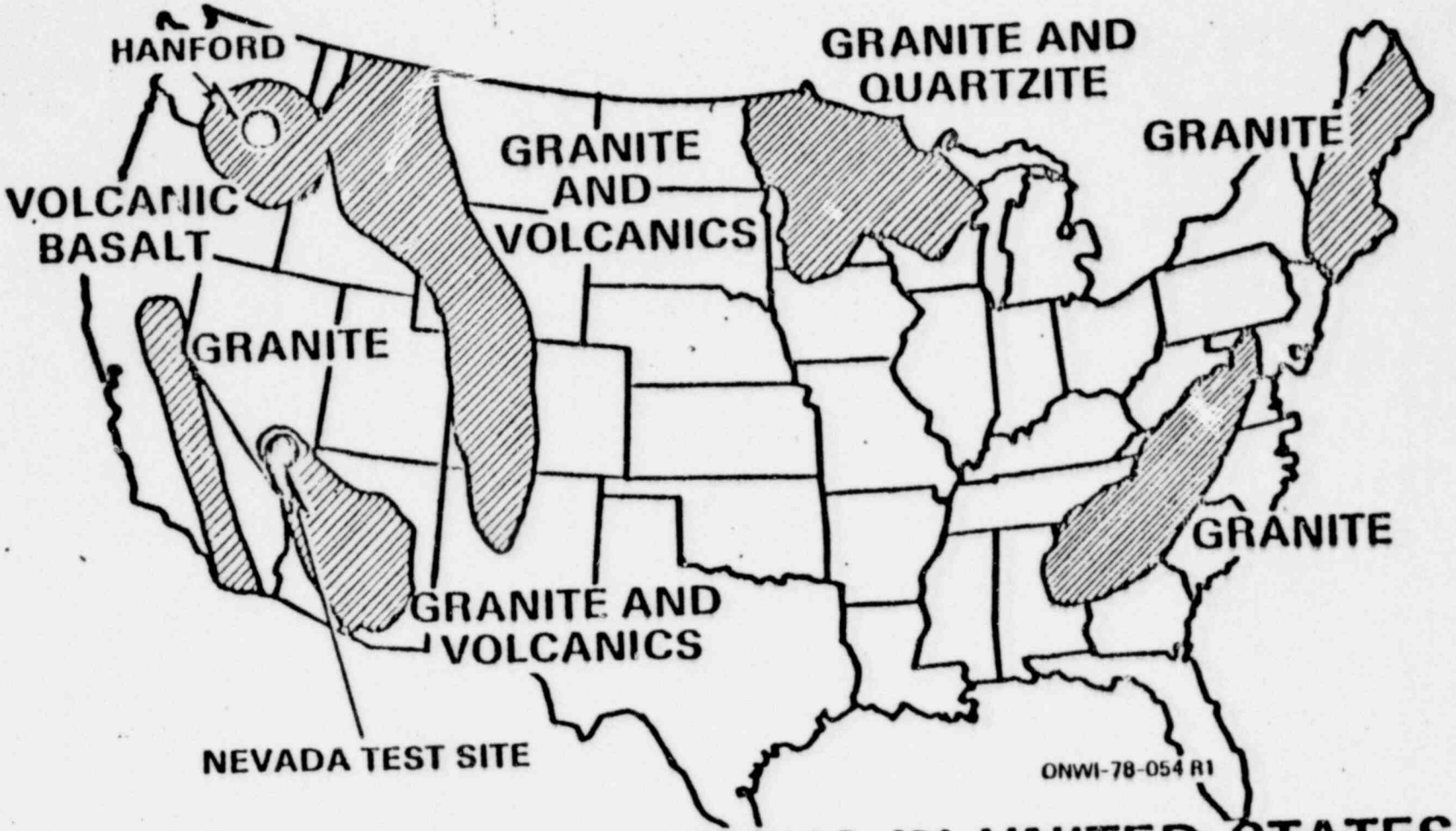
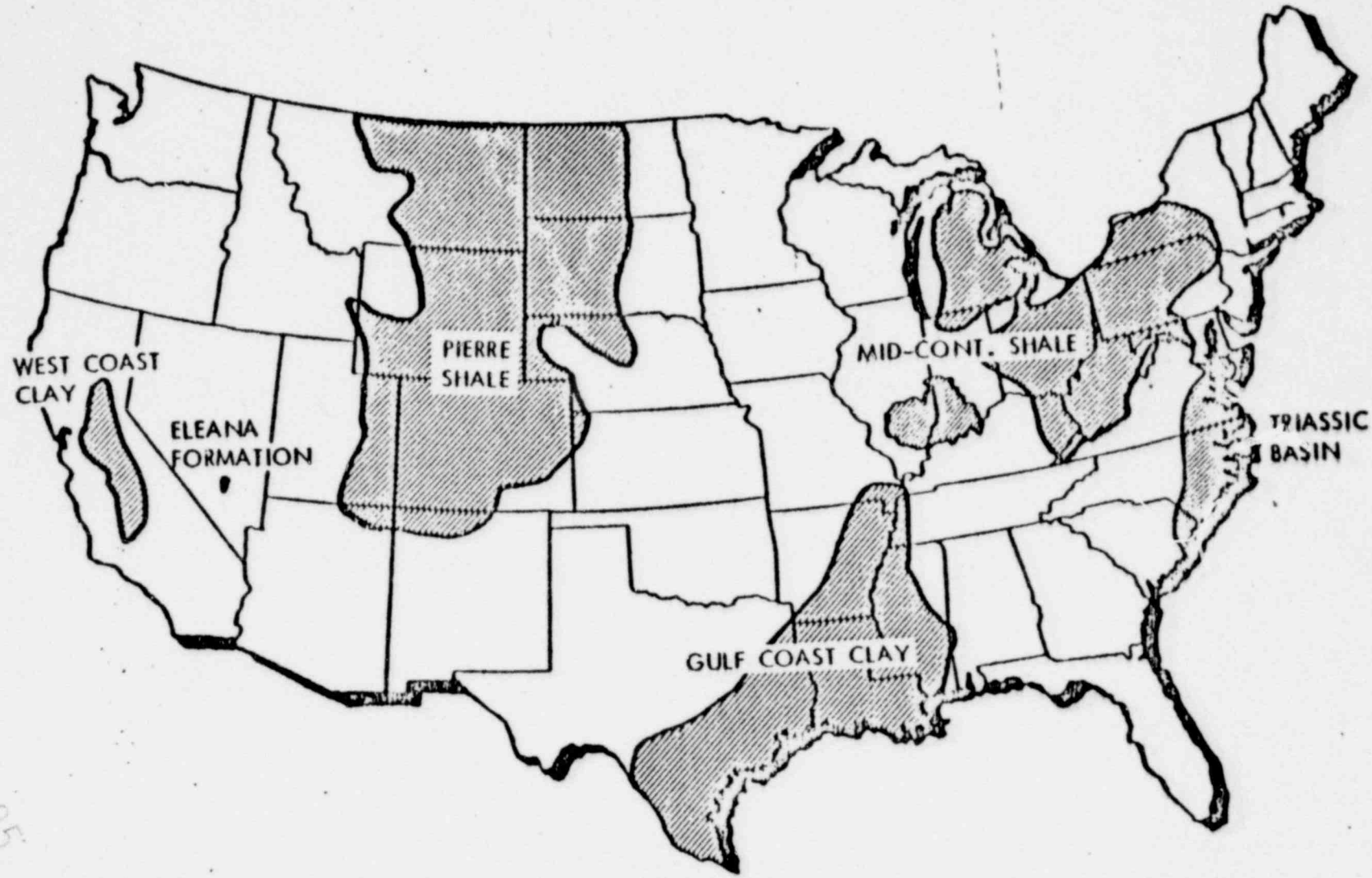


CRYSTALLINE FORMATIONS IN UNITED STATES



ARGILLACEOUS FORMATIONS IN UNITED STATES

ONWI-78-055

PROGRAM PLANNING

- EARTH SCIENCES TECHNICAL PLAN -

- PURPOSE - TO IDENTIFY COMPONENTS OF A COMPREHENSIVE PLAN NECESSARY TO RESOLVE EARTH SCIENCES ISSUES AND QUESTIONS SO THAT GEOLOGIC REPOSITORIES CAN BE CONSTRUCTED.

- GOAL - AN INTEGRATED PROGRAM PLAN, BY FALL OF 1979, WHICH WILL COMPILE THE SPECIFIC R&D TASKS THAT MUST BE CONDUCTED.

- STATUS - A DRAFT DOCUMENT, AUTHORED BY USGS AND DOE, WAS COMPLETED IN 1/79 THAT PROVIDES AN INITIAL ASSESSMENT OF THE ISSUES/QUESTIONS, THE CURRENT R&D TASKS, PROGRAM PRIORITIES, AND IDENTIFIED TECHNICAL QUESTIONS THAT REQUIRE ADDITIONAL ATTENTION.

  - FIVE TOPICAL SUBGROUP REPORTS (SITE SELECTION, WASTE/ROCK INTERACTIONS, ROCK MECHANICS, SEALING AND PUBLIC RISK) HAVE BEEN COMPLETED TO SUPPORT PREPARATION OF THE INTEGRATED PLAN.

WASTE FORM SELECTION STRATEGY

PRIOR TO IRG RECOMMENDATION

- O GLASS REFERENCE FORM FOR DWPF
- O FINAL DECISION ON DWPF FORM IN FY 1980
- O ALTERNATE FORMS INVESTIGATION

CURRENT APPROACH

- O FULL REVIEW OF ALTERNATE FORMS CHARACTERISTICS BY END FY 1981
- O ENGINEERING REVIEW OF TWO TO FOUR SELECTED ALTERNATE FORMS BY END FY 1983
- O DWPF RETAINING GLASS AS REFERENCE FORM BUT WITH FLEXIBILITY FOR CHANGE
- O FINAL DECISION ON DWPF FORM BY FY 1984

WASTE FORM PLAN

- o HIGH-LEVEL WASTE MANAGEMENT STRATEGY DOCUMENT UNDER PREPARATION
  - SUMMARIZES PLANS INCLUDING WASTE FORM DEVELOPMENT
  - PUBLIC DISSEMINATION END OF CY 79

- o HLW PROGRAM PLAN UNDER PREARATION
  - WORK BREAKDOWN STRUCTURE INCLUDES WASTE FORM DEVELOPMENT
  - INTERNAL DOCUMENT, SCHEDULED TO BE IN FINAL FORM MARCH 1980

WASTE FORM DEVELOPMENT OVERALL SCHEDULE

TIME	ACTIVITY
FY 80	- PLAN FOR IMMOBILIZATION OF WEST VALLEY WASTE
FY 80-FY 81	- INITIAL ASSESSMENT OF PROPERTIES AND PROCESSING FEASIBILITY - SELECTION OF TWO TO FOUR FORMS FOR FURTHER DEVELOPMENT
FY 82-FY 83	- INTENSIVE DEVELOPMENT AND EVALUATION OF PROMISING FORMS - SELECT ONE OR TWO FORMS FOR LARGE-SCALE EQUIPMENT AND PROCESS DEVELOPMENT
FY 84	- SELECT WASTE FORM FOR DWPF
FY 84-FY 86	- LARGE-SCALE EQUIPMENT AND PROCESS STUDIES FOR SELECTED FORM(S)
FY 85	- RECOMMEND REFERENCE IMMOBILIZATION PROCESS(ES) FOR HANFORD AND IDAHO
FY 86	- RECOMMEND REFERENCE IMMOBILIZATION PROCESS FOR POTENTIAL COMMERCIAL WASTE
FY 87-FY 92	- ENGINEERING DEVELOPMENT AND CONCEPTUAL DESIGN FOR HANFORD AND IDAHO PROCESS(ES)

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GHD/9/4/79

INDEPENDENT GENERIC HLW FORMS ASSESSMENT

APPROACH

- O DATA, REPORTS AND BRIEFINGS FROM DOE AND CONTRACTORS
- O NUMERICAL RATING FOR ELEVEN WASTE FORMS
- O CONSIDERED NINE SCIENTIFIC AND NINE ENGINEERING PARAMETERS AFFECTING PROCESS AND LONG-TERM PERFORMANCE
- O THREE SEPARATE RANKING LISTS
  - PRESENT SCIENTIFIC MERITS OR LEAST RISK FOR USE TODAY
  - RESEARCH PRIORITY
  - PRESENT AND POTENTIAL ENGINEERING PRACTICALITY
- O IN EACH RANKING LIST, GROUPED AS
  - TOP RANK
  - INTERMEDIATE RANK
  - BOTTOM RANK
- O IN COMPARATIVE RANKINGS, REVIEW PANEL FEELS STRONGLY THAT
  - PRIMARY EMPHASIS SHOULD BE ON SCIENTIFIC MERIT VERSUS ENGINEERING PRACTICALITY
  - R&D EFFORTS SHOULD CONTINUE ON TOP AND INTERMEDIATE FORMS UNDER RESEARCH PRIORITY

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INDEPENDENT GENERIC HLW FORMS ASSESSMENT

PEER REVIEW PANEL

LARRY HENCH, CHAIRMAN	UNIVERSITY OF FLORIDA	MATERIALS SCIENCE
JACK HUTCHINS	CORNING GLASS	GLASS AND CERAMICS
SHELDON WIEDERHORN	NATIONAL BUREAU OF STANDARDS	CERAMICS
AL COOPER	CASE WESTERN RESERVE	GLASS
DENNIS READY	OHIO STATE	CERAMICS
FRANK VERSNYDER	PRATT AND WHITNEY	METALLURGY AND CERMETS
ROD EWING	UNIVERSITY OF NEW MEXICO	GEOLOGY GEOCHEMISTRY
ROGER STAEHLE	UNIVERSITY OF MINNESOTA	METALLURGY

NOTE: LIAISON REPRESENTATIVES (NONVOTING) FROM SRL, SRO, ONWI AND NRC INVITED TO FIRST MEETING. REPRESENTATIVES FROM OTHER FEDERAL AGENCIES/GROUPS MAY ATTEND FUTURE MEETINGS.

HLW ALTERNATIVES FORM DEVELOPMENT PLANNED - FY 1980 FUNDING

WASTE FORM	DEVELOPER	FY 80 BUDGET THOUSANDS B/O	BASIS
MATRICES, BARRIERS	BATTELLE	550	PRE-IRG
ADVANCED CALCINES	IDAHO	800	PRE-IRG
CLAY CALCINE	HANFORD	250	PRE-IRG
METAL MATRICES	ARGONNE	180	PRE-IRG
HOT PRESSED CONCRETE	OAK RIDGE	300	PRE-IRG
CERMET	OAK RIDGE	235	PRE-IRG
SYNROC	LIVERMORE	1000	1979 INITIATIVE
SOL-GEL FEED PREPARATION	OAK RIDGE	250	1979 INITIATIVE
TITANATE CERAMIC	SANDIA	160	1979 INITIATIVE
CANISTER MATERIALS	BATTELLE; OAK RIDGE	800	1979 INITIATIVE
MATERIALS CHARACTERIZATION CENTER	BATTELLE	2200	1979 INITIATIVE
SITE FORMS ASSESSMENTS	SR, ID, RHO, PNL	1500	1979 INITIATIVE
FUNDAMENTAL STUDIES	UNIVERSITIES; DOE LABS	500	1979 INITIATIVE
CRYSTALLINE CERAMICS	ROCKWELL/PENN STATE	1300	1980 INITIATIVE
POROUS GLASS MATRIX	CATHOLIC UNIVERSITY	700	1980 INITIATIVE
HIGH SILICA GLASS (LOW TEMP.)	WESTINGHOUSE	335	1980 INITIATIVE
SYNROC VERIFICATION	NC STATE	40	1980 INITIATIVE
PROCESS AND EQUIPMENT DEVELOPMENT	BATTELLE	900	1980 INITIATIVE
		12000	

ETW MATERIALS CHARACTERIZATION ORGANIZATION

PURPOSE:

- o TESTING AND QUALIFICATION OF MATERIALS FOR REPOSITORY DISPOSAL

NEEDS:

- o PLANNING AND STANDARDIZATION OF TESTS
- o COORDINATION AMONG DOE FIELD OFFICES AND CONTRACTORS
- o CONTROL OF TEST PROCEDURES AND RELEASE OF TEST DATA
- o IDENTIFICATION OF MATERIALS REQUIRING CERTIFICATION
- o SCHEDULING OF ACTIVITIES TO MEET REPOSITORY MILESTONES

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ETW MATERIALS CHARACTERIZATION ORGANIZATION

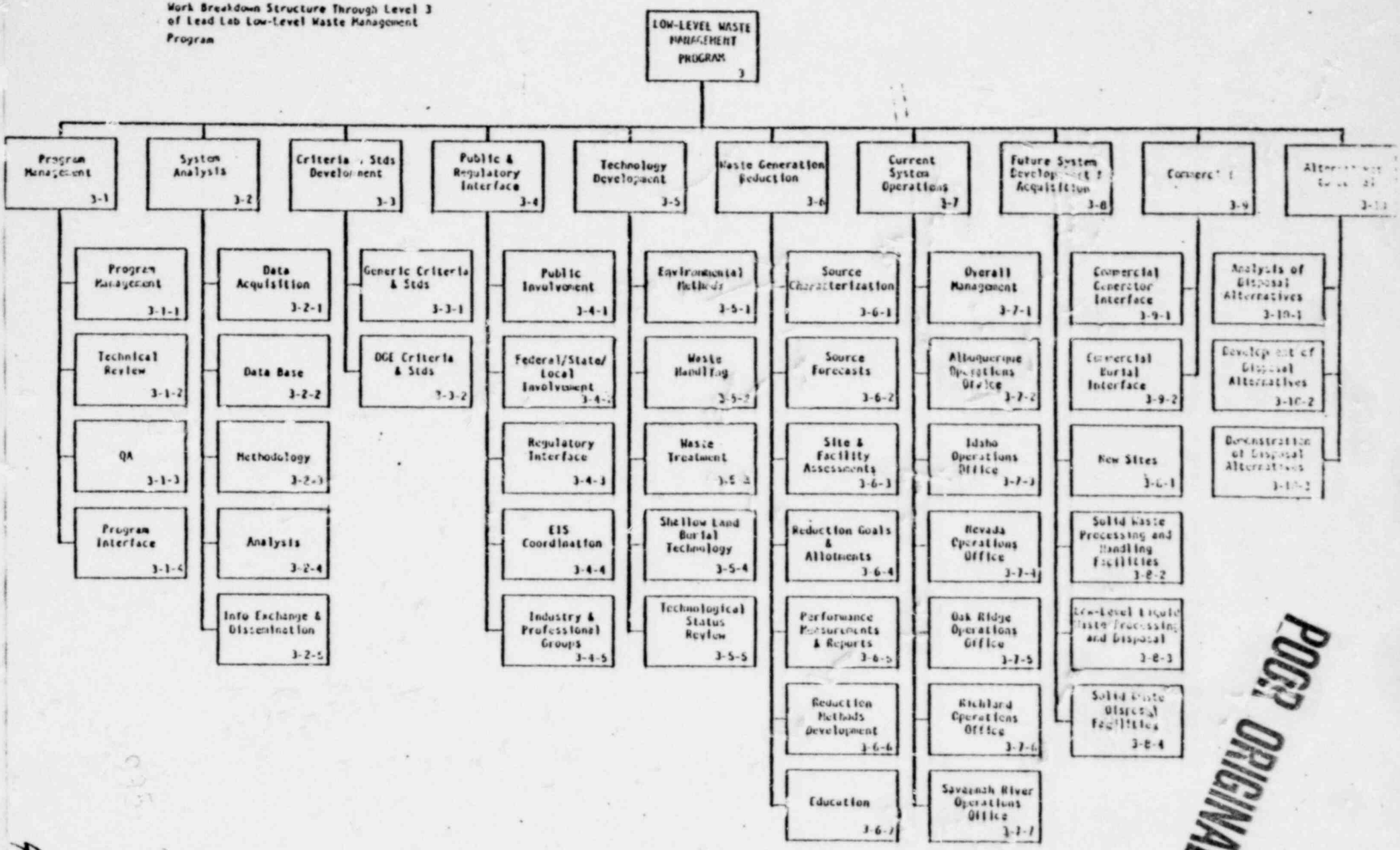
STATUS

- o MATERIALS STEERING COMMITTEE
  - INITIAL MEETING SEPTEMBER 7, 1979
  - TO REVIEW AND APPROVE CHARTERS OF OTHER COMPONENTS
  - TO ESTABLISH INTERFACE CONTROL MECHANISM
  - APPROVE MEMBERSHIP AND CHAIRMAN OF MATERIALS REVIEW BOARD
- o MATERIALS REVIEW BOARD
  - TO BE PROPOSED BY SAVANNAH RIVER
  - FIELD OFFICE RESPONSIBILITY TO BE DETERMINED
  - CHAIRMAN TO BE FULL-TIME FUNDED ASSIGNMENT
  - BROAD PERSPECTIVES AND EXPERTISE TO BE REPRESENTED
  - SAME MEMBERS FROM OUTSIDE CURRENT WASTE MANAGEMENT PROGRAMS
- o MATERIALS CHARACTERIZATION CENTER
  - RESPONSIBILITY ASSIGNED TO BATTELLE/PNL AUGUST 1979
  - FIELD OFFICE RESPONSIBILITY TO BE DETERMINED
  - SAVANNAH RIVER PROVIDING INITIAL GUIDANCE AND FUNDING
- o INDEPENDENT MEASUREMENTS LABORATORY
  - RICHLAND-COLUMBUS TO PROPOSE CONTRACTOR

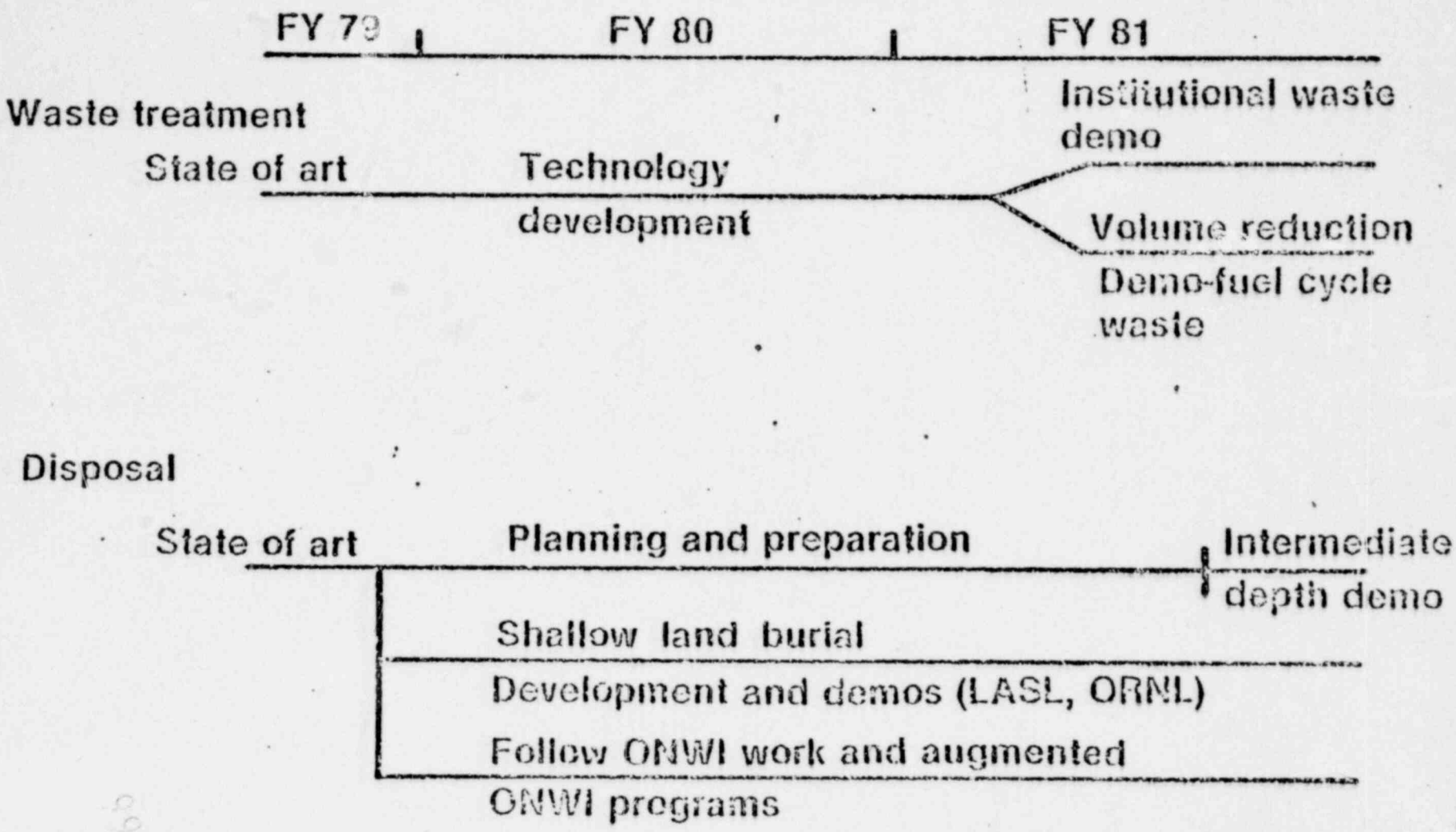
LOW - LEVEL WASTE MANAGEMENT PROGRAM

CHANGES IN TECHNOLOGY DEVELOPMENT ELEMENTS SINCE APRIL

Work Breakdown Structure Through Level 3 of Lead Lab Low-Level Waste Management Program



Technology Development Schedule



WASTE TREATMENT STATUS

- SURVEY OF CANDIDATE SOLIDIFICATION AGENTS AND PLAN FOR DEVELOPMENT TO BE COMPLETED IN FY 80
- TWO TECHNIQUES FOR FUEL FABRICATION LIQUID LLW AVAILABLE BY END - FY 81
  - BIOLOGICAL DENITRIFICATION
  - ULTRAFILTRATION - REVERSE OSMOSIS
- INCINERATOR TECHNOLOGY APPLICATION TO INSTITUTIONAL WASTES FIRST AND THEN REACTOR WASTES
  - FEASIBILITY TESTING OF ALTERNATIVE INCINERATOR/SOLIDIFICATION SYSTEMS IN FY 79 AND 80
  - SELECT ONE FOR FULL SCALE TEST AT U OF MD

ALTERNATIVE DISPOSAL METHODS STATUS

- SCOPING STUDY OF VIABLE ALTERNATIVES UNDERWAY
- INTERMEDIATE DEPTH DISPOSAL GIVEN HIGH PRIORITY
  - 30 TO 50 FEET OF OVERBURDEN
  - START FIELD TESTING 4/80 AT NTS
  - BEGIN DEMONSTRATION IN FY 81 AT NTS
  - COMPLETE DEMONSTRATION IN FY 83
  - FEASIBILITY STUDY AT SR IN FY 80
- ADDITIONAL ALTERNATIVES
  - "PIGGY BACK" ON ONWI, AUGMENTING LAB TESTING AS REQUIRED
  - POTENTIALLY PARTICIPATE IN ONWI DEMONSTRATIONS

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BASALT WASTE ISOLATION PROGRAM
- STATUS -

- SITE EVALUATION
  - REPOSITORY SITE LOCALITIES IDENTIFIED IN AUGUST 1979; CANDIDATE SITES TO BE IDENTIFIED BY OCTOBER 1979
  - SERIES OF DEEP DRILL HOLES ON HANFORD SITE BEGUN TO ESTABLISH DEEP HYDROLOGY MODEL
- IN SITU TESTING
  - EXCAVATION OF THE THREE TUNNELS, EXTENSOMETER ROOM, AND TWO TEST ROOMS OF NSTF COMPLETE
  - DRILLING OF THE PHASE I (ELECTRICAL HEATERS) TEST HOLES COMPLETED SEPTEMBER 1979
  - PHASE I TESTS ON SCHEDULE - JUNE 1980 STARTUP
  - PHASE II TESTS (SPENT FUEL) UNDER REVIEW BY DOE & TECHNICAL PEER REVIEW GROUP
- TECHNOLOGY DEVELOPMENT
  - CANDIDATE MATERIALS FOR BOREHOLE PLUGGING IN BASALT IDENTIFIED; LAB TESTS UNDERWAY TO ESTABLISH PREFERRED MATERIALS
- REPOSITORY
  - KAISER ENGINEERS/PARSONS-PARTHKERHOFF SELECTED BY DOE FOR 2 YEAR CONCEPTUAL DESIGN STUDY

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS

- STATUS -

SITE EVALUATION

- o WITHIN BOUNDARIES ALLOWED BY SUBORDINATION TO WEAPONS TESTING PROGRAM, GRANITE AND SHALE DEPOSITS TECHNICALLY DISQUALIFIED: YUCCA MOUNTAIN (TUFF) BEING FURTHER INVESTIGATED
- o GEOLOGIC INVENTORIES HAVE BEEN COMPLETED OF THE GRANITE, SHALE AND TUFF FORMATIONS IN SOUTHERN NEVADA (EXCLUDING NTS)

IN SITU TESTING

- o ELEANA SHALE - NEAR SURFACE HEATER TEST SUCCESSFULLY COMPLETED
  - TEST DATA ANALYSIS UNDERWAY
- o CLIMAX (GRANITE) SPENT FUEL TEST - MINING/EXCAVATION WORK COMPLETED LATE SPRING
  - SPENT FUEL/AUXILIARY HEATER/INSTRUMENTATION HOLES COMPLETED JULY 1979
  - SPENT FUEL SHIPMENTS FROM TURKEY POINT (FLORIDA) TO BCL (OHIO) BEGUN EARLY SEPTEMBER 1979
  - FIRST 2 OF 13 SPENT FUEL SHIPMENTS FROM BCL TO NTS TO BEGIN WEEK OF 9/16/79
  - TEST IS ON SCHEDULE - 4/80 STARTUP

OFFICE OF NUCLEAR WASTE MANAGEMENT

REMEDIAL ACTION (RA) PROGRAM

OBJECTIVE: TO IMPLEMENT THE DOE PROGRAMS OF NUCLEAR FACILITIES DECOMMISSIONING, REMEDIAL ACTION (RA) PROJECTS AND ASSOCIATED TECHNOLOGY DEVELOPMENT

OFFICE OF NUCLEAR WASTE MANAGEMENT

REMEDIAL ACTION (RA) PROGRAM

ELEMENTS AND SUBPROGRAM OBJECTIVES:

- FORMERLY UTILIZED SITE RA PROGRAM (FUSRAP) - IMPLEMENT RA AT SITES FORMERLY UTILIZED BY MED OR AEC WHICH HAVE RADIOLOGICAL CONTAMINATION ABOVE CURRENT UNRESTRICTED GUIDELINES.
- URANIUM MILL TAILINGS RA PROGRAM - IMPLEMENT RA AT DESIGNATED INACTIVE URANIUM MILL TAILINGS SITES UNDER PL-95-604.
- GRAND JUNCTION RA PROGRAM - CONTINUE PROJECTS UNDER PL 92-314 APP. C AS AMENDED BY PL 95-236 TO REMOVE TAILINGS FROM GRAND JUNCTION STRUCTURES.
- D&D OF DOE OWNED SURPLUS FACILITIES - ELIMINATE THE LARGE INVENTORY OF PRE 1976 AND "D&D AS YOU GO" POST 1976 ET FACILITIES.
- ARRANGE THE TRANSFER OF TECHNOLOGY ARISING FROM D&D PROJECTS AND SPECIFIC R&D PROGRAMS.
- IMPLEMENT D&D ACTIVITIES WITHIN THE FRAMEWORK OF A WEST VALLEY SITE PROGRAM.

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STATUS OF SITES THAT MAY REQUIRE SOME FORM OF REMEDIAL ACTION

Eng./Env. Studies Underway or Complete	Radiological Survey Complete or In Preparation		Surveys Required
Palos Park Forest Preserve Site A/Plot M Chicago, Illinois	Conservy Inc. (Virginia-Carolina Chemical Corp.) Nichols, Florida	E. I. du Pont de Nemours and Company Deepwater, New Jersey	Iowa State University Ames Laboratory Ames, Iowa
Kellex Corporation Jersey City, New Jersey	Gardinier, Incorp. (U.S. Phosphoric Plant Uranium Recovery Unit) Tampa, Florida	Ashland Oil Company Haist Property Tonawanda, New York	Davidson Chemical Division W. R. Grace & Co. Curtis Bay, Maryland
Middlesex Municipal Landfill Site Middlesex, New Jersey	Blockson Chemical Company Chemicals Group, Olin Corporation Joliet, Illinois	Seaway Industrial Park Tonawanda, New York	Ventron Corporation (Metal Hydrides Corp.) Beverly, Massachusetts
Former Middlesex Sampling Plant Middlesex, New Jersey	National Guard Armory Sand and Cottage Grove Chicago, Illinois	Seneca Army Depot Romulus, New York	Watertown Arsenal Watertown, Massachusetts
Acid/Pueblo Canyon Los Alamos, New Mexico	University of Chicago Chicago, Illinois o Eckert Hall o Jones Laboratory o Kent Laboratory o Iverson Hall o Animal quarters	Simonds Division Guterl Special Steel Corp. Lockpoint, New York	Linde Air Products Division Union Carbide Corporation Tonawanda, New York
Bayo Canyon Los Alamos, New Mexico		Niecon Metals, Inc. Horizons, Inc. Cleveland, Ohio	Harshaw Chemical Co. Cleveland, Ohio
Chupadera Mesa White Sands Missile Range, New Mexico		Universal Cyclops Incorporated (Vulcan Crucible Steel Co.) Aliquippa, Pennsylvania	Albany Metallurgical Research Center U.S. Bureau of Mines Albany, Oregon
Canonsburg Industrial Park* (Vitro Rare Metals Plant) Canonsburg, Pennsylvania			Former NAL Nuclear Site Norton, Massachusetts
Pennsylvania Railroad Landfill* Site Burrell Township, Pennsylvania	Mallinckrodt, Inc. (Formerly Mallinckrodt Chemical Works) St. Louis, Missouri		
	St. Louis Airport Storage Site St. Louis, Missouri		

*To be covered under the Uranium Mill Tailings Remedial Action Program
**New Site

URANIUM MILL TAILINGS PROGRAM

GOAL:

DETERMINE AND PERFORM REMEDIAL ACTION AT INACTIVE URANIUM MILL TAILINGS SITES THAT CONTAIN RESIDUAL RADIOACTIVE MATERIALS. FOLLOWING REMEDIAL ACTIONS, THOSE SITES FROM WHICH MILL TAILINGS ARE TO BE REMOVED WILL BE RELEASED FOR UNRESTRICTED OR LIMITED USE. THE MILL TAILINGS DISPOSAL SITES WILL BE CONTROLLED BY THE FEDERAL GOVERNMENT.

PRIORITIES OF URANIUM MILL TAILING SITES

I. HIGH PRIORITY SITES

1. VITRO (SALT LAKE CITY)
2. CANONSBURG
3. DURANGO
4. SHIPROCK
5. GRAND JUNCTION
6. RIVERTON
7. GUNNISON
8. OLD RIFLE
9. NEW RIFLE

II. MEDIUM PRIORITY SITES

1. MEXICAN HAT
2. LAKEVIEW
3. FALLS CITY
4. TUBA CITY
5. NATURITA
6. AMBROSIA LAKE

III. LOW PRIORITY SITES

1. GREEN RIVER
2. SLICK ROCK (MC)
3. SLICK ROCK (UCC)
4. MAYBELL
5. MONUMENT VALLEY
6. LOWMAN
7. CONVERSE COUNTY (SPOOK SITE)

REMEDIAL ACTION PROGRAM
GRAND JUNCTION REMEDIAL ACTIONS

SCOPE: AN ESTIMATED 800 STRUCTURES IN GRAND JUNCTION, COLORADO, THAT HAVE BEEN BUILT ON OR USE URANIUM MILL TAILINGS ARE BEING CLEANED UP IN A JOINT FEDERAL-STATE PROGRAM.

AUTHORIZATION: CONGRESS PASSED LAWS BASED ON COMPASSIONATE RESPONSIBILITY TO PAY 75% OF THE COST TO CLEAN UP PROPERTIES IMPACTED BEYOND SURGEON GENERALS GUIDELINES.

ET ACTIONS UNDERWAY/PLANNED

PROGRAM IS MANAGED AT GJO WITH STATE OF COLORADO IMPLEMENTING THE RA'S. ACTIVITY WILL BECOME A SUBSIDIARY OFFICE TO ALO URANIUM MILL TAILINGS REMEDIAL ACTION PROGRAM OFFICE.

FUNDING	THRU FY 1979	TO END OF PROGRAM IN FY 1984
FEDERAL	6,714	12,500
STATE	2,238	4,164
TOTAL	8,952	16,664

DECONTAMINATION AND DECOMMISSIONING OF DOE SURPLUS FACILITIES

GOAL:

DECONTAMINATE SURPLUS, RADIOACTIVELY CONTAMINATED DOE FACILITIES IN ORDER TO PERMIT OTHER PRODUCTIVE USES WHERE POSSIBLE, ELIMINATE ANY POTENTIAL HAZARDS TO PUBLIC HEALTH AND SAFETY AND TO THE ENVIRONMENT, AND REDUCE THE COSTS OF MAINTENANCE AND SURVEILLANCE.

SPECIFIC ET D&D OBJECTIVES

- TO ACCOMPLISH D&D OF DOE FACILITIES DECLARED SURPLUS PRIOR TO OCTOBER 1, 1976; ET FACILITIES DECLARED SURPLUS AFTER OCTOBER 1, 1976; AND OTHER FACILITIES WHICH MAY BE DESIGNATED AS THE RESPONSIBILITY OF ET IN THE FUTURE.
- TO CONDUCT R&D PLANNING AND FACILITY-SPECIFIC ENGINEERING IN SUPPORT OF D&D ACTIVITIES.
- TO ASSIST INDUSTRY AS APPROPRIATE IN COMMERCIAL FACILITY D&D.
- TO PROVIDE A D&D INFORMATION CENTER AND A FACILITY D&D RECORD-ARCHIVE CENTER, AND TO DISSEMINATE D&D TECHNOLOGY.
- TO COORDINATE EFFORTS WITH D&D ACTIVITIES IN OTHER DOE ORGANIZATIONS (ER, EV, DP, AND RA).
- TO PARTICIPATE IN APPROPRIATE INTERNATIONAL ACTIVITIES IN RADIOACTIVE FACILITY D&D.