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NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

BUDGET PRESENTATIONS - CONTINUED

Place - Washington, D. C.

Date - Wednesday, August 1, 1979 Pages 1 - 67

Telephone:
(202) 347-3700

ACE - FEDERAL REPORTERS, INC.

Official Reporters

444 North Capitol Street
Washington, D.C. 20001

NATIONWIDE COVERAGE - DAILY

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BUDGET PRESENTATIONS - CONTINUED

Room 1130
1717 H Street Northwest
Washington, D.C.

Wednesday, August 1, 1979

The Commission met, pursuant to notice, at 9:30 a.m.

BEFORE:

DR. JOSEPH HENDRIE, Chairman.

PETER A. BRADFORD, Commissioner.

RICHARD T. KENNEDY, Commissioner.

JOHN AHEARE, Commissioner.

VICTOR GILINSKY, Commissioner.

ALSO PRESENT:

MESSRS. BARRY, ENGELHARDT, GOSSICK, LEVINE, BUDNITZ, and ARSENAULT.

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P R O C E E D I N G S

CHAIRMAN HENDRIE: We meet this morning to continue our discussions with the Staff on the agency budget. We were scheduled this morning to take up the Office of Administration, the EDO offices, Commission offices, and indeed we will do that, but we are going to start with the cycle on the environmental division side of the research office which we were unable to get to yesterday afternoon.

Lee, do you have anything to start?

MR. GOSSICK: No.

VOICE: I will give you the information on the development area. I mentioned there was 1600 hours of computer number, which was a correct number, but it was for all of RSR, but just for the code development area, so when I got home last night I realized that, and of the $15 million that we are requesting for code development, about 5 million is for the computer.

MR. BUDNITZ: On the other hand, all of our side does have something like $11 million for the computer.

MR. GOSSICK: That includes fast reactor codes and fuel codes, but that's -- some of it's in fast and some of it's --

All right, on with the SAFR division. We have Frank Arsenault, who is the Division Director, and Sam Bassett who is the Deputy Director. Sam will make the

presentation.

CHAIRMAN HENDRIE: Fire away, Sam.

MR. BASSETT: Thank you.

CHAIRMAN HENDRIE: It's a help if you call out the slide number.

MR. BASSETT: We will start with No. 87. And we will start with the waste management unit division.

[Slide.]

Our division unit is divided into three programs: low level, high level, and mill tailings subject, and in high level we are going forward into a substantial campaign of research and investigation in support of what are now emerging and clarifying objectives by NMSS as we examine their role for regulatory process. They are reaching some tentative criteria which I think have been presented to you, but in general they have determined a course of action for their concentration of efforts to make themselves ready for licensing of high level waste repositories.

In this connection, we are going to engage in a program that's been in the planning process for this past year, and go forward with heavy emphasis on waste form, with concentration on the substitute, waste formulations. And a secondary and heavier concentration will be on the termination of site properties.

It is the NMSS position that they would like to see

four or five potential sites completely, scientifically described and characterized before they will be willing to consider an application for such a repository.

COMMISSIONER AHEARNE: Is that what you meant by site properties?

MR. BASSETT: Yes. It's a complete characterization of the site. We are in receipt today, as a matter of fact, of their determination of what they feel they will need to know about potential sites before they will --

COMMISSIONER GILINSKY: What is it that you are actually doing? They are not looking at sites?

MR. BASSETT: No, sir. We are doing the studies to find out what it is we should know about a site, and across the spectrum from the start in geology. The past, present and future use of the site as best it can be encompassed. The design of the sort of shaft and repository engineering that would be necessary to accommodate that type of geology, that type of tectonics and so on, and then the actual operations and its impact.

COMMISSIONER GILINSKY: How does what we do relate to what DOE does?

MR. BASSETT: Well, we have to know what the best estimate is of the credibility of DOE's submittal, when we make a statement about the impact of certain geological features, we have to be at least abreast and understand the

concepts that they are conveying to us, and that's the nature of our investigation.

COMMISSIONER AHEARNE: That sounds more like reactive, whereas your original description sounded more like you were trying to develop some requirements which you would then lay on, or NRC would lay on DOE. Which do you do?

MR. BASSETT: More than that. We have to be ready for DOE submittal with full knowledge of what the hazards and the safety aspects and the general operation considerations are.

COMMISSIONER AHEARNE: Let me try my question again:

In the characterization of siting, so that NMSS believes we have to have a handful of sites fully characterized, and so this is, as I understood what you were saying, is the research program is oriented at determining what must be obtained to so-called fully characterize a site. What you have to know about it.

But that then sounds like this is information which you would then -- we would then give to DOE and say, "Here is what you must do in order for your submittal to meet our requirements for full characterization of the site." As opposed to us being ready for receipt.

MR. BASSETT: DOE has been spending hundreds of millions of dollars in this same area, and it is not our intention to do other than to recognize in the sites that

they are presenting the factors that are important for a licensing review.

COMMISSIONER AHEARNE: Are we using different contractors, or are we piggy-backing on their project?

MR. BASSETT: No, we are using different contractors. We are intending to use several universities, the University of Arizona.

MR. LEVINE: It would be our intent to develop requirements independently of the schedule of what they are doing. Hopefully if we get them done in time, or whenever they are ready, they will be given to DOE.

MR. ARSENAULT: May I add a point? I think the distinction in the two elements that Commissioner Ahearne has mentioned, initially we are trying to identify what it is about the site that should be measured in order for us to assess it for a repository.

DOE will then perform the detailed engineering studies and make measurements that would characterize the specific site for which the license is being sought.

We have to have sufficient independent understanding of the limitations on the various measurement techniques so that we can assess the submittal by DOE.

That would be the distinction. In the one case we described, what must be --

MR. LEVINE: But the question here is will we give

any priority requirements to DOE. What is the timing there.

MR. BASSETT: There are some things we have to do right away, for example. We want to make sure DOE doesn't destroy the site in the process of characterizing it. That is very important.

That means what we have to do right away is determine what needs to be known and what is the proper approach. It might be that when you sink a shaft, that will have to be the shaft that would be used if the site is used.

Maybe we couldn't afford to do extensive investigation without working right down the hole. That sort of things needs to be determined.

MR. BUDNITZ: There is also the question of the form of the waste. We are not sure yet whether we are going to have specific core requirements for the fuel, or whether we are going to react on what they give us, and determine whether it's adequate. It's a question of whether we are in front of, or behind of, or on the way.

We may be a little behind the way, but we are struggling to make sure that we get there.

MR. LEVINE: We expect an application about 1985, as I understand. We will have a considerable amount of work done prior to that, and that work can be used to set requirements that the DOE has to meet.

The exact timing of when they do their investigation,

how much investigation they do prior to the application, how much we have at this particular time, is not really known with that precision yet, so we can say yes, we are going to give them requirements before they send up the application, or before they do their work.

But certainly there would have to be a continuing exchange of information.

COMMISSIONER GILINSKY: What is NMSS' role in deciding what gets done?

MR. BASSETT: Well, there, in general, setting the general areas of investigation, and more importantly, I think, indicating to us their general approach to licensing -- in other words, what is their criteria, they have selected the waste itself as their prime defense, and stating the objective that the waste form should resist any significant leakage for the first thousand years.

This puts the --

COMMISSIONER AHEARNE: Did you have any kind of a research program which led to that, supported that?

MR. BASSETT: I think it has come about partly as a result of some of our investigations that have been going on for the last couple of years, but more particularly, as a result of an extensive look that they have had into the programs going on across the country in DOE.

It turns out that waste forms are not a matter of

common agreement. There's a big dust-up going on right now with the National Academy of Science, which you may be familiar with, and there's a lot of prejudice in the community as to what the proper waste form should be.

However, it is pretty well agreed that the waste form can do a large measure of the protective job. The waste form in the first two or three uses of repository, properly studied, properly selected, can do a large measure of the long-term job that has to be done by the repository.

But this does require a complete knowledge of waste forms, and we have not yet gotten the program going.

COMMISSIONER GILINSKY: Sounds like something we ought to hear more about.

MR. LEVINE: This is part of a program evolving between ourselves and NMSS.

MR. BUDNITZ: This work that this money is allocated for will be physical research predominantly; not all, but mostly chemistry, geochemistry, this kind of thing.

[Slide.]

MR. BASSETT: This is a breakdown of the high level waste program. It indicates the scope -- it indicates the scope of our investigations in the high level waste area. As you can see, the investigations in the waste form container characteristic, this is in a logical progression both in time and in space.

We took the investigations and the interaction between the waste and its container in the rock. We then have to take considerable interest in the propagation of any leakage through the hydrogeological area in which leaks -- and this has to do finally with the health and environment impacts of any long-term deposition in the biosphere of this waste.

The emphasis, as you can see, is heavily on waste formats, container, and on the geotechnical engineering which has to do with the site characterization in the first place, and then modification as the repository is put into it.

These are the areas where the NMSS emphasis lies, and we think correctly --

COMMISSIONER GILINSKY: The reason I asked about NMSS is that when we heard some time ago complaints on contractors, that we were uncoordinated in our approach.

CHAIRMAN HENDRIE: We're still getting hollers from the ACRS.

MR. BUDNITZ: I think it is a fair comment of a year ago, for sure, and perhaps six months ago; but Jack Martin has been there six months or about, and the whole environment in which we are working is budget.

[Slide.]

MR. LEVINE: Addressing the ACRS comments --

COMMISSIONER AHEARNE: Could you go back to the

other one you took off?

[Slide.]

I noticed that there is nothing really which would meet the ACRS question, and I guess some other people's question on the criteria. It seems to raise the point that one of the aspects of the program ought to be focused upon criteria.

MR. BASSETT: The program is formulated that way, indicates the extent of the criteria by the areas of emphasis.

As I say, the criteria for defense primarily is waste form in the immediate few inches of the repository.

COMMISSIONER AHEARNE: Well, would you address specifically the ACRS objection?

MR. BASSETT: Yes, that's No. 88, please.

[Slide.]

On the general comments, the ACRS comments were diffused through some pages of text, which is compressing it somewhat, but I think this is a fair representation of their comment.

Under their first one, the ACRS felt that we needed to better define goals and establish priorities and communications, increase personnel assigned in the bulk of criteria.

This is a general comment, and we agree that the ACRS comment fairly reflects the state of this field as of the

first part of this year, and indeed --

COMMISSIONER AHEARNE: Well, they actually were a little harsher than that, I think. As I read it, they say even a cursory effort would help identify needed program elements. At least the inference is, therefore, and they claim this was a review of what was submitted to the BRG, and the implication is, at least, that therefore what we submitted to the BRG, they could not even find a cursory effort in developing criteria.

MR. BASSETT: It may be true, and we do agree that that criticism is justified on the basis of the submittal.

However, we also feel that the criteria are identified, and that our program is responsive to it.

We have recently, in the last three months, made organizational and started into being a waste management review group, which comprises -- is chaired by NMSS, and advises representatives, and that's one of our first chores.

COMMISSIONER AHEARNE: Maybe I'm misreading this, but at least the impression I have is what the ACRS, one of the issues they are raising is, the NRC, at least on the side of NMSS, has established what they say here is what the criteria will be, but that's not a supported set of criteria, it's a position.

We have formally transmitted that to DOE, and I

think the ACRS is saying that you ought to have some technical basis for that criteria, and they looked into the program and they didn't see that, that development of what they would view should be in a research program, to try to find out what should be -- what is the technical basis for criteria, and maybe those criteria are wrong.

MR. BASSETT: Indeed, these criteria are emerging, but they are only emerging in plans that have been published in the last month or the last two months, and we have identified them, we've got a program, and find that we are going in the right direction.

MR. BUDNITZ: What it says up there is about right. This is a chicken and egg, kind of a bootstrap thing, and everybody recognized that the criteria arrived at to date should be -- probably almost surely are going to be modified some as we get into this. So we are going to try to do research to find out if the foundations are right, and if not, to modify them, but that is going to be a year or two away.

MR. BASSETT: One of the bases of the $3 million supplement identified for waste management was that it wasn't -- to the point, that it was decided it was an appropriate thing to do, and we could really find a way to spend that money, and now we think we can, and we are very glad to have that.

MR. LEVINE: A year ago --

COMMISSIONER AHEARNE: There's a hand waving at the

back of the room.

MR. DAVIS: Dick Davis.

I just had one more item there that might be of interest in regard to your question. At the present time we are well along with the plan; in fact, a schedule where in certain areas of the chart that was shown previously, we will bring in our senior contractor along with a blue ribbon peer group of outsiders, experts in the field, and they will look at the proposed criteria that NMSS is developing, and at the DOE Program, and they will take a cut at what are the logical best criteria we can come up with at the present time.

We are working right close with NMSS on this, and then out of that, they will take the next step to identify other areas where they think additional efforts are needed --

[Commissioner Kennedy entered the room at 10:00.]

-- to improve the criteria.

MR. LEVINE: I was going to say it's just about a year that NMSS started to work on a program for waste management. The research program is still being formulated, so we are seeing a sort of a midstream as the ACRS did. We think we are headed in the right direction. However, the plan is not fully formulated.

MR. BUDNITZ: I was going to make a different kind of a general comment, which is that about a year ago when I got here, the first thing that I noticed about this was it

was characterized by one word: chaos. It's not now in perfect order, but we are on our way. I am not completely confident that we can get in front of that wave that I mentioned a few minutes ago.

DOE is spending so darned much money in so many areas, that just keeping on top of what they are doing, in order to do our regulatory responsibility right, is going to be one heck of a hard job.

But my personal view is that in the last several months, since Jack Martin became in charge of it, things are beginning to emerge in a more orderly way, and we are sure going to be better off a few months from now than we were last year.

MR. BASSETT: In this connection, the IRG plan, which is in the White House, had as one option submittal of a single site, characterization of a single site, which was resulting in license applications perhaps in 1982, and NMSS' position, which has been communicated to DOE, is there is nothing they could do with such a submittal. There is no way they could cope with that, on two bases:

One, philosophically the single site submittals are inappropriate; but second, if it worked, they wouldn't have a place to cope with such an application.

COMMISSIONER AHEARNE: Perhaps the philosophical point --

COMMISSIONER GILINSKY: Well, let's see. Is that because it's such a hard job to come up with criteria, or because what we did in the past, four or five years, wasn't worth very much?

MR. BASSETT: I think it's the latter, and partly the former, in that they have never really addressed how we play this game: Do we have defense in depth, and all three portions contributing, or do we rely 100 percent on the base limit, and so on. We are just facing up to this now; in the last three months, we've had, in the waste management review group, we have been all the way through for the first time the steps that are necessary to get it going, and Standards and NMSS and Research and NRR are parties to it, and we are already going.

COMMISSIONER GILINSKY: You are saying to pin it down, the program was misdirected, or not directed?

MR. LEVINE: Not directed.

COMMISSIONER GILINSKY: Over the past several years that didn't add up to what it should have added up to?

MR. BUDNITZ: The program in the Office of Research, as I said last year, as we came into '79, is small and best described by the word eclectic. There were a few little things here and there that were being done, a couple of things on glass and, you know, a little bit of geology, but there wasn't any way to take the list of projects --

COMMISSIONER GILINSKY: Without assigning a specific responsibility to the agency as a whole?

MR. BUDNITZ: If you look to see where our effort tied into NMSS', the ties were equally kind of eclectic; that is, you know, they may or may not tie together at all.

COMMISSIONER GILINSKY: When did this become evident? This is something --

MR. LEVINE: I've been after SAFR to give me a research program of high level management that was directed toward some useful objective, and as Bob says, all we could do is to find little pieces that seemed useful, but we couldn't get a whole program together, and it is only in the last year that we as an agency started to write a waste management program for the agency. But things are beginning to get better focused.

COMMISSIONER GILINSKY: How is it that somebody hasn't come up to us and said our waste management program isn't any good, three years ago?

MR. GOSSICK: I don't think anybody else was any better off in being able to judge. I think everything we say about our program, I've heard said about DOE's program.

MR. LEVINE: I think that has been a big part of the problem. I think the IRG report was a necessary focal point.

COMMISSIONER GILINSKY: Let's see -- I don't see how we can pass this off to DOE.

MR. LEVINE: I'm not trying to do that.

MR. ARSENAULT: Characteristics, for example, of the program that helped illustrate the type of chaos that existed was a commitment, for example, to the repository of salt that continued for some years, and had a tendency and controlled and directed the NRC program. Then suddenly it was perceived that perhaps that wasn't the way to go, or that one needed to look at a variety of repositories in order to select the best one.

It's had a tremendous impact on the agency's program.

COMMISSIONER GILINSKY: It would be one thing if you said here is DOE coming in with a new medium that we haven't looked at, but I seem to be hearing you say come in with salt.

MR. ARSENAULT: If they come in with bedded salt, we are not ready.

COMMISSIONER GILINSKY: We're not ready for that one either, so, you know, we go through these sessions year after year, thinking that we are doing the right thing.

MR. BUDNITZ: I don't know whose fault it is, because it was before I got here, but I am going to give you an observation, and that is in high level waste in FY '78, we had a little over a million dollars in this office. I don't remember those numbers.

Okay, now in FY '79, the year we are in, we are spending one or two million dollars in the Office of Research for high level waste, there's something wrong somewhere.

Now I don't know how that came about.

COMMISSIONER KENNEDY: Let me suggest in the interest of getting on with the subject at hand, we are talking to the wrong people. And, Lee, maybe in order to resolve this, we should get the waste management people back, if people want to talk about that, but it's kind of foolish to talk to these people about the waste management program since they don't manage it.

COMMISSIONER GILINSKY: Well, they had a piece of the research program.

COMMISSIONER KENNEDY: Almost nothing.

Anybody who has a real comprehension of the waste management program of this government would understand that $1.2 million is not even enough for the postage. It is a program of several hundred millions of dollars research, and for us to chase around with the notion that $1.2 million is an enormous research program is absurd.

MR. BUDNITZ: Especially since it was in six or seven little projects, none of which was related to the other one.

MR. BASSETT: The best one we could choose was -- based on one medium, the best one we could choose added up to

$1.2 million.

COMMISSIONER GILINSKY: We seem not to be prepared on that one, either. Why don't we go on.

MR. BASSETT: Let's go back to No. 87, please.

[Slide.]

As you can see --

COMMISSIONER KENNEDY: Can we discuss this further, as there seemed to be some difference of view? I would appreciate the waste management people coming back to discuss it.

MR. BUDNITZ: We all be here together.

COMMISSIONER KENNEDY: I think the program managers ought to be the people here to talk about it.

MR. BASSETT: I'd like to say that we feel the present administration in NMSS is taking a real straight-forward look at this and facing up to their problems, and they are emerging as a result of this.

COMMISSIONER AHEARNE: And as one notices, there is a very sizeable increase in the funding.

MR. BUDNITZ: But more important than that increase itself is that it is based on a notion --

COMMISSIONER AHEARNE: There's a concept --

COMMISSIONER KENNEDY: There's a word that applies here, leadership. It now has some. It has had for several months.

MR. BASSETT: Low level waste, as you can see, we are addressing ourselves to a better understanding of a disastrous situation that existed in West Valley and Maxie Flats and Sheffield, and indeed most of the eastern low level waste sites.

We find that the situation is chaotic, we are going to face -- the way the waste gets there, and the way it is handled, to the long-term keeping of the facilities.

We've had substantial need to investigate the packaging and the handling and the hopefully compacting of waste. These wastes range, as you know, from such things as rubber gloves all the way to heavy chunks of metal, and there is a substantial need to understand interaction of this waste with the shallow site. And it may well turn out that in moist environments, the shallow site is not the long-term answer.

And the more we look into this, we are being besieged by the states and by EPA and by USGS to get in with them in a joint investigatory effort to find out where these sites will go, what can be done as palliative, if there is any, and in the long run --

COMMISSIONER GILINSKY: Are you looking at waste forms there, too?

MR. BASSETT: Yes, we are looking at waste forms in terms of should there be liquid in these drums. Frequently there is sloshing liquid in the drums which leaks. It should

perhaps be dried before it gets there. What sort of control do we have over the shippers, and how much can we afford to get into it. How can states interact, and so on.

COMMISSIONER KENNEDY: How do you prevent migration off the site?

COMMISSIONER AHEARNE: There seems to be some discussion whether all these resins should be solidified or not solidified. Is that something that you are looking into?

MR. BASSETT: It is. One of the big problems, in fact, is that these drums come in with liquid in them, and they are not supposed to have liquid in them. They come in with water or other things that interact with steel.

COMMISSIONER AHEARNE: You are actually addressing a different issue. It's more than just sloshing liquid. It's a much more near time question.

MR. BASSETT: Well, in terms of Three Mile Island, Research has been consulting with them as to how much water can we get in and how much water can we get out.

COMMISSIONER AHEARNE: Who have you been dealing with?

MR. BASSETT: Brookhaven, under a contract between them --

COMMISSIONER GILINSKY: What about the question of solidifying and put the resins into some kind of matrix? Is that what they do? At least that is what will be required

of all reactors beyond some --

CHAIRMAN HENDRIE: There are a couple of processes, one of them which seems to be giving some trouble, is the process that resulted in the leaking of the drums at Beatty that caused a shutdown.

One good way to handle the resins is to make concrete out of them, mix them up with sand and cement, just immobilizing the --

COMMISSIONER GILINSKY: Is this simply imbedding the resins in the matrix?

CHAIRMAN HENDRIE: Just immobilizing the -- and then there is a -- let's see, there is a proprietary Dow process based on monomers or something like that; I'm not sure about it.

But, anyway, there is a proprietary Dow process, which I've heard a successful trial is being made, so there are several.

MR. BASSETT: It may be necessary to decommission and wrap some of these places up as beyond help, and we have to know what is involved there in sealing and ultimate care of these places.

And, finally, we have to look into some other alternatives. It is possible that they should be buried considerably deeper. Considerably deeper and ocean burial is a possibility, and indeed all of these things rolled into

the program is the immediate local community, state, federal government interaction program, trying to do this.

We have recruited several very good people in the last year into our waste management section. We have Dr. Ed Helm, who is very well known and effective, and he has put together a very sensible program, and then we have support from the states and the other authorities.

So we are sort of proud of our own little waste approach. We don't know exactly where it is going with these existing sites, because we don't know really how bad off they are.

Now, in mill tailings, which is the third category --

CHAIRMAN HENDRIE: Could you go to 88 again?

[Slide.]

MR. BASSETT: Yes.

COMMISSIONER AHEARNE: The lower left, last one, could you speak to the issue of the reduction, volume reduction. A number of people have expressed some interest in it.

MR. BASSETT: There is a substantial research project underway in DOE to accommodate a broad base study of this area, and we are organized with the NRC and EPA and NIH, which is a large generator of such wastes, to exchange information and give advice.

Would you address the situation of the last thing

on the ACRS comment, volume reduction methods?

MR. DAVIS: We have items in our plan to interact primarily with Brookhaven, relative to exploring the methods to reduce the volume.

The problem gets into incineration, so that you don't cause another type of pollution, and we are moving ahead very rapidly on that right at the present time.

MR. BASSETT: We have one project of our own only, and that is this thermal luminescent detector wastes, which are large in quantity, and we are exploring ways of diminishing that.

However, there are many, many different waste forms, and each requires a different attention.

COMMISSIONER AHEARNE: The last line on the right-hand side seems to indicate -- it says research project planned and 1980 supplement. At least the submittals I have don't indicate that you have requested an '80 supplement.

MR. BASSETT: We believe we have requested a $3 million '80 supplement.

COMMISSIONER AHEARNE: I see. The BRG moved $3 million into it, but I don't think, at least if I read all this correctly, you didn't request an '80 supplement.

MR. BASSETT: That's correct. As I said before, Commissioner, it is only the last three or four months that we could really have the confidence to have a program that

could use an extra $3 million. The BRG actually was greeted by us as a pleasant surprise. We were ready at that point. We weren't ready two months before that.

CHAIRMAN HENDRIE: The disposal volumes from TLD are not the badges, it's that toluene based scintillator fluid that's the pain in the neck.

MR. BASSETT: That's correct.

If we could have No. 89, we will have additional ACRS comment.

[Slide.]

The alternatives in shallow land burial has not been funded. We are able to start this in '80, with successful achievement of the supplement, and it will take three forms:

It will take the form of ocean disposal, deeper mine disposal, and alternate methods of shallow land disposal.

The ACRS addressed our lack in decommissioning and long-term care. This was partly an identification problem, because it's already included on the sites suitability studies at West Valley and Maxie Field, and we are going to do some work on the West.

They also addressed themselves to incineration and massive digestion in reducing volumes and wastes, and we are going to be involved with NIH on an incineration program in '79, and we are planning a joint data base field work and

modeling effort with EPA, USGS, NIH and DOE.

Then in the last comment, the ACRS addressed themselves to the need of equipment for assay of waste packages. The idea here is that when the package gets to the site, they'd like to be able to look at it and see what's in it, and we agree in principle, but we can't quite figure out quite how to do it, and we would like to find out -- we would like to find out if it is indeed even possible. So we are going to take a look at it.

Can we go back to 87, please.

[Slide.]

CHAIRMAN HENDRIE: If you can afford the film, why, wrap film around the drum, take a picture, and then turn it on its side and take another one, and if things seem to be flowing to the low point, that's a hint.

[Laughter.]

COMMISSIONER AHEARNE: You could slosh the drum and see if it sloshed.

CHAIRMAN HENDRIE: Let me ask a question. Section 211 of the Atomic Energy Act coming up here in the appropriations bill says, "No funds appropriated under this act may be used for the purpose of providing for licensing approval of any disposal of nuclear waste in the ocean."

I don't know whether that's going to go or not, but it's just kind of a little odd note, that might just

slide right on through. We are not in a position of licensing or approving disposal of waste.

COMMISSIONER AHEARNE: Isn't it EPA who handles the licensing of that?

CHAIRMAN HENDRIE: We both do.

COMMISSIONER AHEARNE: I thought we had responsibility for this stuff out to that area of the actual disposal was to be in.

CHAIRMAN HENDRIE: The way the licensing works under the -- what is it, Marine Resources and Sanctuaries Act, or something like that, you can't dump radioactive waste in the ocean unless you have a permit for that dumping from EPA.

On the other hand, when you get your EPA permit, you get ready to send it out, you can't possess and take the waste out to dump it unless you have a materials possession license from us.

COMMISSIONER AHEARNE: But the actual dumping is EPA.

CHAIRMAN HENDRIE: Yes, that's right.

Anyway, I'm not sure whether this language could be read to allow research work connected with possible ocean disposal or not. Anybody got any idea?

COMMISSIONER AHEARNE: Check with the Staff.

MR. BASSETT: One last thought on the wastes. One of the problem is they are frequently toxic substances.

We are confronted with the fact that when it leaks, it leaks radioactive toxic substances. In mill tailings, we have considerable interest in stabilizing the tailings piles, and trying to find out in connection with page S-3 and other things what the aerosol effects from radon contamination picture is for the tailings situation.

In this connection, there was considerable interest in the 250 acrefeet when the storm broke a week or so ago, so we have jumped on that with great interest, and yet that was one of the best methods known, and the dam failed surprisingly and suddenly.

This is the sort of thing we are facing. Again, there's a substantial local interest in these activities, and our research effort goes along the line of finding out what sort of aerosol, what sort of gas comes about as a result of this material being placed on the surface. What does ground water have to do with it, how much danger is there in getting into the ground water. And as I say, when the dam broke, a lot of it went into the surface water. The stabilization, proper methods of decommissioning, and finally the health effects of these substances.

That accounts for our waste management program on the mill tailings program.

CHAIRMAN HENDRIE: Let's move briskly.

MR. BASSETT: Could we have No. 91, please.

[Slide.]

I think perhaps one thing we should address on the waste is one last item in moving of dollars forward from our request for '81 into a supplement for '80. The money was simply taken out of our request for '81, and we feel that more sensibly that money should be taken out of our request for '81, '82, and '83 together, slightly more --

COMMISSIONER AHEARNE: You mean $3 million ought to be --

MR. BASSETT: Three years, and that would give us slightly more in '81, which would last to get these programs going.

MR. BUDNITZ: So we have appealed, I guess, 1.8 of that difference with 12.1.

COMMISSIONER AHEARNE: But you agree with 3 million to the supplement?

Where do I ask -- what's the proper place to ask my question on spent fuel?

MR. BASSETT: Right now.

COMMISSIONER AHEARNE: Okay. The ACRS, in their comments, as you know, raised the question there was inadequate funding as part of the research program is concerned.

Could you comment?

MR. BASSETT: We think that's right. We found that even in DOE, very little effort has been devoted to the idea

that both retrievable and permanent storage of spent fuel is a very large part of the long-term plan, and we found that there was substantially no interest in that at DOE or at NMSS, or even our own research.

However, we have started planning and we have programs in mind for spent fuel both in terms of AFR storage of spent fuel which goes --

COMMISSIONER AHEARNE: Is that reflected in this budget?

MR. BASSETT: Yes, it is.

COMMISSIONER AHEARNE: Since obviously the ACRS is looking at the budget and didn't see it, could you name --

MR. BASSETT: We have detailed programs. I can name the topics that we are going to study.

MR. ARSENAULT: I am looking at the soluble uranite, which is already underway, and second to assess spent fuel integrity, cladding, and finally, the question of simulating the repository conditions, seeing what their effect is on cladding. These are the three projects we have underway.

MR. BASSETT: Under another decision unit, we have a project evaluating the long-term in water storage of spent fuel. It's going to be quite significant.

COMMISSIONER AHEARNE: Now they also, in their comments, went on to say that part of the problem is the shortage of qualified people in the geological area. I interprete

that within research.

MR. BUDNITZ: You interpreted that right.

COMMISSIONER AHEARNE: Can you make a comment?

MR. ARSENAULT: We have asked for more people. We are supplementing our staff in that area, and we would like to do more along those lines.

MR. LEVINE: I just have to say that the whole treatment of the SAFR division in the last several years has kept us to submarginal level. I've made this point every year in the budget review, and that's what you are getting.

MR. BUDNITZ: The number of disciplines required isn't even represented by one of each, not to mention having the kind of community that can work together well.

MR. BASSETT: Going to the environmental reactor effects program description, just to touch base on the waste management area, we are calling on rearrangement of money and three people to cope with the $3 million supplement.

When we come to the reactor environmental effects program description, we are requesting a substantial requirement, and we'd like to go into a little bit of the situation.

COMMISSIONER GILINSKY: Let me ask you, where is reactor instrumentation area? Is that in your area?

MR. LEVINE: Ours, and some in PAS, and for instance, what would be needed to follow the course of an accident would probably be risk assessment.

MR. BUDNITZ: We have environmental instrumentation.

MR. LEVINE: We're planning such studies.

COMMISSIONER GILINSKY: But not reactor --

MR. LEVINE: Did I answer your question?

COMMISSIONER GILINSKY: Did you -- I guess I may have missed it. Did you cover that?

MR. LEVINE: Yes, we did. We have a study, a planned study, in our PAS group.

COMMISSIONER GILINSKY: Would it be in the -- if you are talking about hardware, would it be in that --

MR. LEVINE: It's not hardware, it's really to say what is needed to follow the course of an accident, to assist the operator, how should it be displayed. So it's been a part of our improved safety research program that we designed a year ago.

MR. BUDNITZ: It's not instrumentation development, per se.

COMMISSIONER GILINSKY: I was rather surprised in the Lessons Learned group to find that they feel there is no adequate instrumentation available commercially to provide this.

MR. BASSETT: In that connection, we did work with Brookhaven in developing an item, 131 detector, for use by federal research authorities. It was used in TMI, but it's the only case I know of. But that was again environment.

COMMISSIONER GILINSKY: I'm talking about wide ranges.

MR. LEVINE: Measure of activity inside the plant.

MR. BUDNITZ: That happens to be one of many other things, one of the fields of research I did personally. I know a lot about that, and I didn't agree with that comment, that it was not available or could not be readily made available. I just didn't agree with that.

COMMISSIONER GILINSKY: Could you send me a brief note on that? It's a subject I'm interested in.

MR. BASSETT: In the environmental reactor effects program, we address ourselves to the wide range of the effects of the environment of reactor operations, and potential siting of reactors.

This is the place where NRC comes up face to face with EPA. We do not find that these programs are in general very well -- not too sympathetic to ACRS. They tend not to be interested in socioeconomics of siting --

COMMISSIONER AHEARNE: Comments --

MR. BASSETT: And indeed, when they gave us the cut at the BRG, they took us to 6.2 million. ACRS addressed this and said it's perfectly simple, just leave out the socioeconomics. We concur. And I'd like to show you a slide -- we concur with the observation, we concur that we could make it if we stayed out of the field where we are required to be by EPA requirements.

I'd like to go to Slide No. S-3, please.

[Slide.]

This is the crux of our situation in reactor environmental effects. We have a substantial body of work, a large amount of which is environmental, and a substantial body of work, a large amount of which is environmental in nature, and as such has no particular warm sponsor except by the licensing people who have to face these environmental questions.

MR. LEVINE: They have a sponsor, NRR.

MR. BASSETT: I say the licensing people have to face these problems when they are brought up in the various processes. I want to run through the history a little bit, even though I have Budnitz' -- I've only been here a year, too.

If you go back as far as '78, $5.6 million was the user request of work in this field, and our budget plus amendment amounted to 4.5, and we were left with user certified needs of $900,000, some of which went into '79.

In '79, at that point, we had 6.4 with the budget plus amendment, we got 5.2, and our shortfall was 1.2. Some of these things tend to age and go away. Licensing people will put them out on assistance contract or something, and take whatever answer they can get, because they haven't got the long range approach that research does, and go ahead on that

basis.

Similarly, in '80, the 1.2 shortfall was played in large part into the 6.8 backlog. This came down to 4.3, and now we are facing a backlog of $2-1/2 million, and this $2-1/2 million represents things that people certify that they need from the various operating divisions, that they need to have.

So, we decided that we'd better bring this to a head and request a sufficient requirement to do the job, and we are not asking for any blue sky activity here. We just want enough to get our backlog worked out so we can carry out the research that the licensing people think we need.

That's a very short summary of what is a very long and complex situation.

T.2 MR. LEVINE: We've been telling this year after year, that there's a shortfall in this area, we have needs that we are not provided, and user requests to back it all.

MR. BUDNITZ: It's also fair to say if you look at our ranking, this is not the highest priority within our rating. We'd like risk assessment and so on, reactor safety, but this stuff seems to have a major impact on the way CPs and OLs end up.

MR. BASSETT: Our answer to ACRS comments in this field of reactor environmental effects, they have some minor comments about program directions, with which we concur, and

in which we are incorporating, and then they have this comment about reducing support for socioecological and our answer to that is this slide.

COMMISSIONER AHEARNE: Could you say a few words about the radiation symmetry?

MR. BASSETT: In that field, we are doing studies to determine what the result of accident acute exposures could be.

MR. ARSENAULT: There are two areas: One is the impact of releases, but the other is the occupational exposures. The improvements in those symmetry -- I'm trying to summarize briefly -- largely relate to finding out what the effects are of such things as age and sex, and the health effects. The nature of the deposition of the various radionuclides, where they are deposited within the body, and how that affects the dose and the health effects. Dosimetry now is largely in the area of occupational exposure.

We have work going on in neutron exposure; dosimetry in that area is notoriously inaccurate. I can get into specifics of projects if that doesn't answer your question.

COMMISSIONER AHEARNE: Do you interface directly with the various branches of HEW that are also working on exposure and health effects?

MR. ARSENAULT: We try to stay abreast of what is going on generally in the field. I think the direct

answer to your specific question is no, we have no formal interaction with the individual branches at HEW. We feel we are familiar enough with what is going on in HEW and DOE and in the field generally to know that we are not duplicating any work that is going on, and to feel that is a chance for us to get the specific information that we are in need of.

COMMISSIONER AHEARNE: Now would this also be the item that NRR feels they confine any instruments to, apply to a wide range of release that you could show them that --

MR. BUDNITZ: We could support demonstration -- I'm not sure that's really the right word -- not necessarily going all the way to hardware.

COMMISSIONER KENNEDY: What's the objective of . . decommissioning?

MR. BASSETT: In the environmental area, we are interested in what's involved in the way of residual cladding in the reactor system, how many manpower would it take, are there steps that could be taken before you actually start to cut the system apart, cleanse it, and reduce the amount of burnup when that happens.

Also what is to be done with the parts.

MR. BUDNITZ: The impact of certain regulatory schemes on the volume of waste or its form, and that sort of thing, is part of this plan.

COMMISSIONER AHEARNE: Could I ask --

COMMISSIONER KENNEDY: Decommissioning proposal?

MR. BUDNITZ: Part of this decommissioning line is to study what the impact would be on various waste forms of decommissioning regulations.

MR. GOSSICK: That's tied in with the effort on the decommissioning.

COMMISSIONER AHEARNE: The BRG, as has been pointed out, took a reduction here, if I read your comments. Was it primarily because it was a low item of research?

MR. ENGELHARDT: I'm going to ask Ray Smith to respond to that question.

MR. SMITH: It was partly that. It was partly because we felt that a lot of these siting type issues had maybe less priority now because it was less likely to be construction permits coming in, and also we did some asking around about user requests and some of them are pretty old, and not very badly needed any more.

MR. BASSETT: That's what is going to happen to this year's request.

COMMISSIONER KENNEDY: Could I ask if it is true, did anybody go back to the users and ask them to revalidate the requests, or they just left them like that? If you asked around --

MR. SMITH: The BRG did not.

COMMISSIONER KENNEDY: But if the BRG found this out

by "going around," wouldn't it have then followed in simple management techniques that somebody would have gone back and asked and gotten some kind of a revalidation?

It would seem to me if they haven't, they ought to, and today wouldn't be too late to start.

MR. SMITH: That should happen. It couldn't happen in the time period in the BRG process.

COMMISSIONER KENNEDY: Has it happened since?

MR. SMITH: Not that I know of.

COMMISSIONER KENNEDY: Could you see if it could be done?

MR. BASSETT: We will do that.

Constant scrutiny of the --

MR. ARSENAULT: I think I should say in our contact with NRR, we see no evidence. We are aware of some requests and we have given them less potential effect, we have ignored some of them, but generally, we feel that the program is based on requests that are still current.

COMMISSIONER KENNEDY: That's not quite what the BRG just said. That's the reason for my question.

MR. ARSENAULT: I wanted to point out our experience, it's based largely on contact with the technical level. It is possible they have consulted about it. We will have to get together.

MR. BARRY: We increased the program over '81 to

about 50 percent, but it didn't go to that level, it actually increased about 50 percent from a little over 4 million to a little over 6 million.

MR. BUDNITZ: There is no question in our mind of the ability of the research community out there to undertake work of this kind, we don't think. As opposed to waste management or to risk assessment, both of which are growing rapidly.

COMMISSIONER AHEARNE: Well, my confidence that the research community could undertake work on any volume -- now, it might not meet your quality standards, but I am sure they would be willing to undertake the work.

[Laughter.]

BUDNITZ: Not effectively.

MR. BASSETT: We'll go ahead to safeguards, if that is agreeable.

No. 97.

[Slide.]

Safeguards activities, on three program elements, described as effectiveness of evaluation, inspection methods, and alternative strategies.

In effectiveness evaluation, we are in the process of training users, documenting models that have been developed, and modifying and testing the models against the upgrade rules.

COMMISSIONER KENNEDY: What are these models?

MR. BASSETT: Well, they are typically models that allow you to calculate the shortest path during access in a sensitive area. They are models that allow you to evaluate the probability of a -- they are models that allow you to determine what the odds are about the conversion of the material, the material control situation.

COMMISSIONER GILINSKY: Wouldn't you use models to deal with armed engagements?

MR. BASSETT: It's to allow us to assess the effectiveness of the safeguards proposed by licensing.

MR. LEVINE: The probability of interception of the --

MR. BASSETT: It gives us an objective way so that we can do other than just guesswork or experience. We have an objective way to apply hopefully the same standards and criteria. We can at least, even if it's completely accurate, at least it gives us a common basis.

MR. BUDNITZ: If we have two schemes from the same applicant, that are quite different, it might be more effective against a kind of threat.

MR. BASSETT: Inspection methods, we are working for and with I&E to develop methods and procedures for field evaluation, inspection and evaluation of physical safeguards.

This is to allow them --

COMMISSIONER KENNEDY: Most of this work is being done at Sandia and Livermore?

MR. ARSENAULT: The question was, most of the work is -- most of the work is being done at Livermore.

COMMISSIONER GILINSKY: Have these models been found to be useful in other work? I guess I sound pretty skeptical.

MR. ARSENAULT: I understand that, Mr. Gilinsky. There is a lot of skepticism about these techniques, because it's perceived that they can never accurately model reality, and I think that is true.

COMMISSIONER GILINSKY: We know that. The question is, you know, how useful are they.

MR. ARSENAULT: Let me try to give you a short answer to your question, then. The work the NRC has done in this area is not duplicated anywhere. What its imperfections, it is probably the most advanced work in attempting to provide systematic methods for evaluating protection systems that exist anywhere in the world. Both DOD and DOE have shown significant interest in these techniques for possible applications to their problem. They have used a number -- they have used a few of the techniques in practical applications at Oak Ridge, Savannah River.

COMMISSIONER GILINSKY: Well, this is the kind of thing I would think DOD would know more about it.

MR. ARSENAULT: Well, that turns out it is not true. It turns out we have had meetings with DOD and DOE, and they are very interested in taking advantage of the work

we have done in connection with their own growing interest in this type of evaluation.

COMMISSIONER GILINSKY: We are talking about armed engagements, evaluating situations like that.

I would think that an agency like DOD or some of the law enforcement agencies would be better judges of the effectiveness or the reasonableness of these models than we would be. We are not experienced in police methods or armed engagements.

MR. BUDNITZ: If we accept what Frank said, we are out in front. But I think it's a pretty strong -- if it is right about what we are doing.

MR. LEVINE: Are some of these people consultants? Using some of what people?

MR. ARSENAULT: I'd like to point out your comment about the DOD ability to evaluate this is probably valid, and that's one of the reasons we welcome their interest, and we expect to learn a great deal from our collaboration with both DOD and DOE.

COMMISSIONER GILINSKY: I guess I'd like to hear, when you get a view from them, what that is. I get a little worried when you tell me that we are out in front in evaluating armed engagements.

MR. ARSENAULT: It would be easy to overemphasize the aspect of those methods. The armed engagement model is

one of the weaker parts of the evaluation.

COMMISSIONER GILINSKY: It sounds like excessive confidence on our part, if you know what I'm saying.

MR. BUDNITZ: World's greatest --

MR. BASSETT: If you have an objective method of assessing, if you want to know whether it's a shotgun or a .45 automatic, it's nice to have something more than objective judgment.

MR. LEVINE: Sort of like the WASH 1400. The people questioned the validity of the overall risk assessment performed, and that turns out to be less important in the engineering insights developed.

COMMISSIONER GILINSKY: Except there you are dealing with subjects this agency knows a lot about.

MR. LEVINE: Part of these evaluation models deal with an evaluation of the physical systems.

COMMISSIONER GILINSKY: When you talk about shortest path or something like that, you are talking about outcomes of armed engagements, it seems to me that's another --

MR. BUDNITZ: That's a small part of it.

MR. ARSENAULT: That's small, admittedly. The weakest part of the method of your development.

COMMISSIONER KENNEDY: When you speak of small, Frank, what are we talking about? One a scale of 1 to 100, percentagewise?

MR. ARSENAULT: What fraction of the effort.

COMMISSIONER KENNEDY: It's a very, very small fraction, indeed.

MR. DURST: Less than $400,000. This was the countermodel to the application, primarily the application of the countermodel to field reliability applications.

MR. LEVINE: I'd like to ask a question. Is DOE funding the development of these models? The answer is no, but the reason for that is there were extensive discussions when the NRC was created between ourselves and DOE. We had in mind to start the development, in fact had already started on these models, and the agreement was they would develop hardware needed for designing and building systems, and we would develop the evaluation models, and they would monitor what we were doing.

So there is an agreement about this, not a lack of interest, is my point.

COMMISSIONER GILINSKY: When you do get their view, I would appreciate it if you would send it to me.

MR. BASSETT: Frank is in discussion with Mr. Wiezel at DOD.

MR. ARSENAULT: We have periodic meetings at the management level, and we have more frequent meetings at the technical level. We've only had two of these. We expect comments from both agencies, I would say later in the year, and

we will be happy to send them to you.

CHAIRMAN HENDRIE: Good. Let's move on, please.

MR. BASSETT: 88, please.

[Slide.]

The general comments from ACRS were mild approbation with some feeling that our study of what happened in safeguards at TMI was perhaps not of the highest priority, and we found a way to get the insights that we need there under another project which is going on.

We had proposed to study the safeguards implications of the laser isotope separation process. We identified correctly that this was a comparable problem in the centrifuge process. Both of them share the characteristic of a small sized unit operation. We are going to accomplish this under the centrifuge investigation.

COMMISSIONER GILINSKY: Why are we doing the centrifuge process?

MR. BASSETT: Because we are interested, there is a substantial centrifuge U.S. government plant.

COMMISSIONER GILINSKY: We are not licensing that.

MR. BASSETT: That's correct. We do have an interest in the licensing aspects of private industry, and we feel there is a possibility this will happen in the future, and it's a different form, a physical problem, completely, because of the nature of the process.

COMMISSIONER AHEARNE: This is oriented towards if private industry were to build something?

COMMISSIONER GILINSKY: Is there any real prospect of that?

MR. ARSENAULT: They seem to think so in NMSS, they are discussing it.

COMMISSIONER AHEARNE: Very, very slim.

CHAIRMAN HENDRIE: Not in the next couple of years.

COMMISSIONER AHEARNE: Not in the next decade.

MR. BASSETT: There is a possibility of a license application. We took the ACRS viewpoint in saying small unit operation deserves attention. They saw fit to think the centrifuge was the priority. We happen to know that there's a possibility for license application, but in any case --

COMMISSIONER AHEARNE: I'd say the probability of commercial in laser isotope separation is at least an order of magnitude greater than the probability of --

MR. BUDNITZ: The safeguards issues for small unit operations are not identical, but similar.

MR. BASSETT: We can live with the comment, because of the study we were doing.

COMMISSIONER GILINSKY: The point is to deal with what we see on the horizon. There is a real possibility of getting -- I would imagine it's very small.

MR. BASSETT: Maybe it would be a power plant, if

they go forward with their plans. I have some personal knowledge. It was their decision to go forward.

COMMISSIONER GILINSKY: In that case, it would seem to me we ought to gear our program to --

MR. BASSETT: We certainly will identify what we look at. I think all unit operations, we take a similar scrutiny, whereas in reclama, 99, in the safeguards area, we are asking only that the $400,000 set-aside, under alternatives set-aside, we are asking that that be included in the main effort. The supplies to the first breeder reactor studies of the safeguards implications in the program, and that's our policy decision, we think it should be included in the main program.

MR. BASSETT: 95, please.

[Slide.]

In the area of the fuel cycle environmental program, we are operating here in the effluent control safety systems, occupational health aspects, environmental impacts on the nature and effort of transportation associated with fuel.

The program has gotten good attention in terms of the --

COMMISSIONER AHEARNE: It covers all Type A and Type B spent fuel?

MR. BASSETT: Primarily associated with the reactor fuel center, new fuel elements.

COMMISSIONER AHEARNE: Not such things as the small plutonium packages?

MR. BASSETT: In this area we are carrying on some development of respiratory protection for workers. We are studying the various modes of transportation of spent fuel, the protection of it, the hazards associated with it, and some effort on decommissioning the fuel cycle plants, of which is some prospect. In this area we received $5 million, and we have no requirement.

COMMISSIONER GILINSKY: Are you on the West Valley project?

MR. BASSETT: Yes.

COMMISSIONER GILINSKY: When?

MR. BASSETT: If and when the effort gets underway.

COMMISSIONER GILINSKY: I am asking about your office.

MR. BASSETT: No, I am saying decommissioning category. We are interest in what happens at West Valley.

COMMISSIONER GILINSKY: In the valley, or is it more general?

MR. BASSETT: I think it is more general.

MR. DAVIS: West Valley includes both low level and high level waste, high level from the past. We are conducting an integrated study looking at various aspects of the waste forms that are there, the migration of the waste away from the site, and the geomorphology that is on the site.

CHAIRMAN HENDRIE: This is on the low level site?

MR. DAVIS: In both, actually, now. They are concerned about, for example, the movement -- well, the geomorphology, what will happen to the area on a long-term basis.

This is a cooperative study with the state of New York.

Then back on the other, we are studying the source term of the high level waste in the tanks. They are working closely with NMSS defining material and sludges.

MR. BASSETT: 96.

[Slide.]

These are the ACRS comments. They have taken a significant interest in the radioactive gas effluents, and we will have a program on collection, storage, and transport of krypton, iodine, carbon-14 and tritium. Separation of noble gases from them.

Research should be carried out on decorporation of internally-deposited radionuclides. We don't have complete agreement from our users in this area. However, we think that it is a significant project, and we are going back to try to get a more --

COMMISSIONER AHEARNE: What does the word decorporation mean?

MR. BASSETT: If a person has had some physical uptake.

The last ACRS comment, they felt was in fuel handling, storage and retrieval steps, it seems inadequate, and we disagree with that general approach on the basis that the general handling experience thus far by various people in DOE indicates there is a fairly low risk operation in the storage and handling in terms of a fuel facility, or of a reactor pool.

This has been quite extensively studied.

COMMISSIONER AHEARNE: If, for some reason, the government were to suddenly decide to resurrect the concept of retrieval and surface storage, say air storage, 100-year operation, does the combination of NMSS and research have enough information on hand to be able to address what would be the licensing criteria for such a facility?

MR. BASSETT: I don't think we do, Commissioner. I'm certain our knowledge extends only perhaps to five, 10, 20 years sort of situation. If you start talking in terms of hundreds of years --

COMMISSIONER AHEARNE: No, I'm talking more like --

COMMISSIONER GILINSKY: Where is the specific deficiency?

MR. BASSETT: I don't believe information on spent fuel, I'm pretty certain -- now we do have a project underway for water storage.

COMMISSIONER AHEARNE: Long-term being defined as ?

Where is that underway?

MR. BARTLETT: That is a program which we are talking about, the long-term corrosion business. We have been in negotiation with the Austrians and the OECD on an international program to do physical, chemical, metallurgical measurements of spent fuel in storage, and it will be envisioned at this point, and we have no such work ongoing at the present time, it is strictly --

COMMISSIONER GILINSKY: Why is it something --

MR. BARTLETT: It doesn't await international --

MR. BASSETT: The Austrians are doing it already.

COMMISSIONER GILINSKY: DOE is doing it, I think. There is work at Battelle Northwest Labs, someone came out here and briefed us on it. I hope he is doing it.

MR. BASSETT: A history, 10 years, 15 years.

MR. LEVINE: They are reviewing what history exists, if I recall.

COMMISSIONER GILINSKY: They reviewed the history and looked at various protomechanisms.

CHAIRMAN HENDRIE: What is the long-term program involved?

MR. BARTLETT: What is being proposed is occasionally -- and we are talking about a program, I think, which is going to last over 20 years, to give us some lead time, if they go to AFR and water-cooled storage, to be able

to determine what sort of corrosion mechanisms are operative over the very long term, because the experience to date says everything is fine, but yet there is no data greater than, I think, 15 years. As the gentleman from Battelle briefed you gentlemen before, there is no hard data beyond that time area, and this is the issue of critical concern, I think, in the licensing process as to what happens over the long haul.

COMMISSIONER GILINSKY: Let me ask how much work is going to be funded in that area.

MR. ARSENAULT: By us? We've got a small part at the beginning of '81, that will depend on the results of the work that's ongoing.

COMMISSIONER GILINSKY: Well, here you are spending $400,000 on marbles on engagements between policemen, $150,000 lies on whether spent fuel is going to corrode if we leave it around in water for a long time, when that is a very critical fact and information to basic U.S. policy of the area.

MR. BASSETT: We don't have a strong feeling. It's a great problem. We feel it needs to be looked at in more depth. As we pointed out, we do have some historical information and some existing belief.

COMMISSIONER GILINSKY: Now, if I understand right, it seems that is something we ought to get as good a fix on as we possibly can.

MR. BASSETT: I agree with you. It reflects the

situation. Budnitz pointed out a year ago the thing was chaotic, we had no --

COMMISSIONER GILINSKY: Well, you know, it's 1976 when President Ford said we are going to hold up on reprocessing, shifting spent fuel storage.

Next year President Carter spoke to this, but none of this seems to affect this agency. I mean I find it pretty incredible.

MR. BASSETT: It was the speculation that the fuel elements were going to go --

MR. ARSENAULT: We have a difficulty in identifying the questions to be answered. As Charlie pointed out, there is no problem. There are some studies underway now to find out whether we can discover mechanisms that deserve further study.

COMMISSIONER GILINSKY: Well, you know, if we can confirm that there is no problem, then that's important. If we discover corrosion, that's also important. But we have to have a good fix on that question, because it's going to affect a lot of important decisions.

CHAIRMAN HENDRIE: We've got a 15 or 20 year fix out of the existing experience. What we are looking at here is how far on out can one reasonably go. My best guess in temperature zircaloy or water chemistry is it's probably good for a hundred years.

COMMISSIONER GILINSKY: I think that's probably right,

but it's something one wants to feel confident about.

MR. BASSETT: We'll take another look.

COMMISSIONER AHEARNE: I think Commissioner Gilinsky is reflecting the ACRS' comment on that.

MR. BASSETT: I should point out in terms of storage and retrieval of a repository --

CHAIRMAN HENDRIE: Is the committee talking just about spent fuel handling plants?

MR. BASSETT: No, sir, they are not, from my reading of the comments, they are also talking about storage and retrieval on the repository. But I don't think they had an understanding, since we are addressing it.

CHAIRMAN HENDRIE: Okay.

COMMISSIONER BRADFORD: I raised with I&E what one could look for if the table, which I gather is now due in mid-August, on independent verification on testing environmentally qualified equipment, in that direction, in an extensive way.

Can you speak to that?

MR. LEVINE: Well, I guess there are a lot of questions about qualifying equipment for unusual conditions. If we have to get involved in that extensive sampling, independent sampling program, then it will be very expensive. We can certainly do it.

COMMISSIONER BRADFORD: Big numbers really don't

trouble you.

MR LEVINE: The question is, what do you want to test? Do you want to test the main coolant pump, under conditions such as --

COMMISSIONER BRADFORD: I didn't mean to press the overall policy of how to do it here. Assuming that the Commission does decide to go ahead and do that in some form, what would then we be looking at in terms of budgetary process? Let's say we wanted to start it sooner rather than later.

MR. LEVINE: I think the best way to do that would be to -- for us to do enough research for a set of requirements that the industry had performed. It would be their program, we would fund some money into it so that we could help direct it to the goals we wanted to achieve.

We don't have that kind of money in our budget. It would be a significant amount of money, depending on the amount of coverage you wanted to give, to what kind of environments. Do you want shaker tables, and earthquake tables, so forth and so on.

It would be a large program, multi-millions of dollars.

CHAIRMAN HENDRIE: '80 supplement looks like it could be developed rapidly.

MR. LEVINE: We could do the planning probably under

existing monies that we are asking for, but to then execute the program, there is no money for that.

MR. BUDNITZ: Mr. Chairman, I just wanted to make one overview comment that I feel personally that is concurred in by the other people around the table, although this is my personal view, and that is that in the SAFR division, we have about 25 professionals, the total staffing for this year, the year end is 31. And considering the variety of fields that we are in, the breadth of this program, I am personally convinced that there is no way that this program could be managed as it expands over the next couple of years unless we have more staff, and we have asked for it.

The EDO mark, they have given us 81-6 mark for this year, and we need six more than that. That may look like seven more, because it's seven more the next year, because our '80 number is one less than our '79 number, and that's a very difficult environment in which the SAFR division is operating, a variety of things just can't be coped with.

We deal with all the offices in the whole agency, Standards, NRR, NMSS, and to a lesser extent with I&E, and I am of the personal conviction that the SAFR division staff cannot cope with the amount of work that the agency wants it to do, the quality the agency deserves, without those few extra staff. It really requires it.

Another comment has to do with the character of the

work. In the Office of Research, we have three different activities: the RSR program, the risk assessment work, and this.

In the first two, we are supporting the dominant national effort in that area. We have the dominant national effort in water reactor safety, we have the dominant national effort in risk assessment.

In this, that is not so. What we are doing here is bits and pieces of programs in which there is a larger national effort, environmental and safeguards, and so on, and waste management.

And in that environment, it seems even more difficult to carry out our responsibilities well, when we are not the dominant force like we are in water reactor safety.

MR. LEVINE: We never will be the dominant force.

COMMISSIONER AHEARNE: And you've got to keep in mind, if we are not already, we are very close to being the critical path in waste management.

MR. BUDNITZ: Yes. And to that extent, -- and by the way, the extra staffing is largely in waste management, not entirely, there's also more need in reactor and environmental, where we are on the critical path, of course, because the environmental issues are ours.

My point is only that, I am personally of the opinion that the SAFR division is below what I would call the

marginally effective level of staffing, not in quality, but in size and diversity, and we've got to remedy that, or we are not going to be able to do our job. I really believe that.

COMMISSIONER AHEARNE: Could I make three overall comments?

First off, perhaps it's on one of those papers that I haven't gotten to, but do you have, or is it under development, or planned development, what would be called a long-range research program plan?

MR. LEVINE: We have not.

MR. GOSSICK: It's being laid out, Commissioner Ahearne. I just sent out a piece of paper, particularly on the research program. We hope to have that put together.

COMMISSIONER AHEARNE: Because certainly --

MR. GOSSICK: We laid out one before, as you remember, three years ago, '76, I think. It needs to be revisited, and we have that definitely in the works.

COMMISSIONER AHEARNE: The second thing, what I would have hoped to have seen, and I think it's really too late to see it, but I will just comment, something that would have had with respect to the research program on the effects of TMI and its related -- here is '80, '81, and '82, and here is the base, and then here is the list of things that are cancelled, deferred, or reduced, and here is the things which are added, redirected, or expanded.

I really think it's probably too late to do that.

MR. LEVINE: We had nothing shown on cancellations. We have everything you just said except cancellations. We considered that very carefully.

Certainly we are coming in for massive increase in funds, no question about that. The question is, what can we really reduce, and I just don't see anything of significance.

COMMISSIONER AHEARNE: That leads to my third question, and this is more just a personal request: By next Monday, I guess, if you could, would you give me what you would change for you to take a 15 percent cut from your budget request? The mark is about a 15. If I add the set-asides to the mark, it's about a 15 percent reduction from your request.

Now what you have done, really, is provide arguments for why a lot of those ought to be restored, but for a variety of reasons, financial austerity, or budget control, or something. If we were to reach a conclusion that nevertheless 15 percent ought to be taken, it probably would help to know whether or not you would agree that if 15 percent had to be taken --

COMMISSIONER GILINSKY: Can I ask you how much of this request is to be regarded as TMI-related?

MR. LEVINE: I said that yesterday. In fact, it is slide No. -- if you want to refresh your recollection by

looking at it, slide No. 15.

We have reoriented in '79 already $12 million for TMI -- no, 14 is the one -- we have reoriented $12 million in '79 already to TMI. We are reorienting from our existing '80 program pre the supplement $34-1/2 million, the supplement is another $32 million, and we have the 32.3 for waste management, 29 is for TMI. And in '81, 76.3 million is TMI-related.

COMMISSIONER GILINSKY: What I am asking is certain quarters you get the view that TMI proved the reactors were unsafer than we thought, the latest being a two-page ad in The Wall Street Journal yesterday.

MR. LEVINE: I don't agree with that.

COMMISSIONER GILINSKY: What I was going to ask is what your view, and how it relates to what we are doing, is.

MR. LEVINE: My view is the following:

In one sense, that is correct, in the sense that I said this yesterday, that prior to TMI, we would postulate the set of conditions that actually happened at TMI, mainly that there was a 30-percent metal-water reaction. I think almost everybody I know would have said that, so in the sense that it did not melt, that the core sustained that situation without melting, it's very encouraging. And the basic reason for that, by the way, is that steam cooling is very effective in keeping a core cool. We know that, but we never give any credit for it. We just sort of dismiss it. We know what steam

cooling can do. It's one of the big arguments about the fact, Appendix K criteria, that we give credit for steam cooling, and when we do a realistic calculation, we give credit for steam cooling, we forget about it in the licensing process.

So in that sense, yes, we know there are things that we should have been considering that would tell us that the reactors are pretty good, little better than we thought they would be.

By the same token, I think we are shocked -- I was shocked at what happened there. I think it revealed inadequacies and design inadequacies in safety review. I think the absence of anticipated scrams was very bad, the fact that the reactor was designed to liberally open the relief valve to keep the reactor from scramming, is a bad operation, and our bulletins have fixed that.

I think that's very good. So I didn't think it was a good situation at TMI. I think, however, it can be corrected. If I could have viewgraph No. 1, please, where we know we have to work, a defined space.

[Slide.]

In these areas of severe core damage, it's not a big unknown, mysterious area, it's an area that we have to understand.

COMMISSIONER GILINSKY: You're talking about a fair amount of money, tens of millions of dollars, better part

of $100 million in one year. It has to deal with more than anticipatory scrams, relatively easy to fix, so you seem to be saying they are fundamental questions that need to be addressed.

MR. LEVINE: I think we have to look at thermal hydraulic interactions in the kind of depth that we haven't looked at before, to understand them very well, well enough to model them. There is no code in the world that could predict what happened to the TMI core in detail. We don't even know what happened to it in detail, but there's no core that can predict that.

Nor am I suggesting that we will ever have one, or need one, but we certainly need the understanding of the physical processes that go on, so that we know how to think about keeping out of these situations, and making them less likely to occur, and giving the operator the kind of information he needs to cope with it, if they do occur.

MR. BUDNITZ: I also think it's in a way an exaggeration to hang all of this onto Three Mile Island. However, we conveniently do so because it's also true, for example, we are having a sizeable increase in our risk assessments. I feel that if we are going to have that, whether or not there had been an accident at Three Mile Island, we were growing each year. The Lewis Report said that this was important, and you affirmed that in your own statement.

That's not TMI-related, but of course it's vital to the effort we are undertaking.

The same thing with seismic engineering. That's not TMI-related. We are working on that area because it's important.

Same thing with structures and pipes and so on. So not everything has a TMI label on it. Even stuff that says TMI on it, like risk assessment, is not just because of TMI.

CHAIRMAN HENDRIE: Okay. We've had a good half hour's discussion.

[Laughter.]

The fact that it has taken us two hours is unfortunate.

MR. LEVINE: Let me say, Mr. Chairman, by way of apologizing -- by way of appreciation, I'm happy for the first time SAFR has gotten a full hearing, fuller than it has in past years.

COMMISSIONER KENNEDY: Thank you, Mr. Levine.

CHAIRMAN HENDRIE: Thank you all very much.

Let us contemplate for a second the near term course of events.

Let's see, can we run a little past your leaving time, Vic?

I would hope to run till 12:30 or so. I think we're going to have to work back on some of these audits, either this afternoon, or tomorrow morning.

Well, why don't we take a three-minute stretch and then launch on it, rather than agonizing over it now.

Okay.

[Whereupon, at 11:20, the hearing was adjourned.]

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