ORIGINAL ACRST-1825

OFFICIAL TRANSCRIPT OF PROCEEDINGS

TR04 (ACRS)
RETURN ORIGINAL TO
B.J.WHITE, ACRS-P-315

THANKS! BARBARA JO
#27288 ——— 0\\

Agency: Nuclear Regulatory Commission

Title: Advisory Committee on Reactor Safeguards
368th General Meeting

Docket No.

LOCATION: Bethesda, Maryland

DATE: Thursday, December 6, 1990 PAGES: 1 - 287

ACRS Office Copy - Retain
for the Life of the Committee

ANN RILEY & ASSOCIATES, LTD.
1612 K St. N.W., Suite 300
Washington, D.C. 20006
(202) 293-3950

******** TRANSCRIPT DELIVERY RECEIPT *******
U.S. NUCLEAR REGULATORY COMMISSION

Deliver To:

|____|	Pat Wilder, ASLBP 4350 East-West Tower 4th Floor Phone: 492-4898 (Pat) or 492-5042 (Doris) or 492-7858 (Jack)	|XXX|	Barbara White, ACRS 7920 Norfolk Avenue Room 432 Phillips Building Phone: 492-7288

Hearing Date: 12/6/90 Location: Bethesda, Maryland

Presiding Officer: Fraley Docket No.: ____________

Title Of Hearing: ACRS 368th General Meeting

Work Order No.: NRC-348-402 1 - 287

Service Requested:

Daily: xxx 2-Day: ____ 5-Day: ____ Floppy Disk: ____

Original Only & 5 Copies

Gross No. Of Pages: 287

Net No. Of Pages: 286

No. Insert Pages: 96

Notes & Tapes: ____________

Received By: Barbara G. White 8:20a 12/7/90
Signature Date and Time

ANN RILEY & ASSOCIATES, LTD.
1612 K Street NW, Suite 300
Washington, D. C. 20006
Telephone No. (202) 293-3950
Fax No. (202) 659-0085

PUBLIC NOTICE BY THE

UNITED STATES NUCLEAR REGULATORY COMMISSION'S

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

DATE: December 6, 1990

The contents of this transcript of the proceedings of the United States Nuclear Regulatory Commission's Advisory Committee on Reactor Safeguards, (date) December 6, 1990, as reported herein, are a record of the discussions recorded at the meeting held on the above date.

This transcript has not been reviewed, corrected or edited, and it may contain inaccuracies.

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

***

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

368th General Meeting

Nuclear Regulatory Commission
Conference Room P-110
7920 Norfolk Avenue
Bethesda, Maryland

Thursday, December 6, 1990

The above-entitled proceedings commenced at 8:30 o'clock a.m., pursuant to notice, Carlyle Michelson, committee chairman, presiding.

PARTICIPANTS:

C. Michelson	ACRS Chairman
C. Wylie	ACRS Vice-Chairman
J. Carroll	ACRS Member
I. Catton	ACRS Member
W. Kerr	ACRS Member
H. Lewis	ACRS Member
P. Shewmon	ACRS Member
C. Siess	ACRS Member
D. Ward	ACRS Member
E. Wilkins	ACRS Member
R. Fraley	ACRS Executive Director
J. Zwolinski	NRR/NRC
B. Siegel	NRR/NRC
A. Masciantoni	NRR/NRC
B. Elliott	NRR/NRC
B. Holian	NRR/NRC
C. Reed	Commonwealth Edison
J. Eenigenburg	Commonwealth Edison
D. Vandewalle	Consumers Power
B. Grimes	NRR/NRC
M. Virgilio	NRR/NRC
G. Imbro	NRR/NRC
R. Nease	NRR/NRC

PARTICIPANTS [CONTINUED]

B. Rasin	NUMARC
F. Parker	National Research Council

PROCEEDINGS

[8:30 a.m.]

MR. MICHELSON: The meeting will now come to the order. This is the first day of the 368th meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting the Committee will discuss and/or hear reports on the follow:

FTOL conversions for Dresden Nuclear Power Station Unit 2, and the Palisades Nuclear Plant; High level radioactive waste disposal; and certification of standardized plant designs.

Topics for tomorrow's discussion are listed on the schedule posted on the bulletin board at the rear of this meeting room.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Raymond F. Fraley is the designated Federal official for the initial portion of the meeting.

We have received no written statements or requests for time to make oral statements from members of the public regarding today's sessions.

A transcript of portions of the meeting is being kept, and it is requested that each speaker use one of the microphones, identify himself or herself, and speak with sufficient clarity and volume so that he or she can be readily heard.

I will begin with an item of current interest. It isn't that big a deal, but in front of you in the form of handout number 14, item number 14, is a copy of the ACRS Charter for 1991-92.

Small changes have been introduced. These appear as highlighting in the document. Please examine it. If any members have any comments, give them to Ray Fraley. If there's any item of major concern, just bring it to the attention of the Committee, perhaps during our discussion of future events.

MR. SIESS: What's the source of it?

MR. MICHELSON: We're required to submit this I think every two years, is that right, Ray?

MR. SIESS: I said what is the source of it?

MR. MICHELSON: It's the old one plus small revisions.

MR. SIESS: Who made the revisions?

MR. MICHELSON: Ray is the one who's drafted the revisions.

MR. SIESS: Oh, okay. Then, it originates with us.

MR. MICHELSON: And they are neatly highlighted, now, in this issue so you can spot them without difficulty.

MR. FRALEY: There is one other revision that I expect we will propose. That is from Section 113 of the Regulations.

The statement says that the Committee, at its own initiative, may conduct reviews of specific generic matters of nuclear safety significant items. That is not in the charter now. I propose to add it.

MR. MICHELSON: Yes. I would think that appropriate.

Any comments that you have, give to Ray. If you think that a Committee discussion might be needed, then we'll try to arrange it, either on Saturday or chart one maybe during future events.

Okay. There are no other items of current interest except I'd like to bring to your attention we are having our annual Christmas buffet luncheon. A notice is at your table. It's in Room 422, from 12:00 to 1:30. I expect all the members would probably want to attend.

Carl?

MR. SHEWMON: Yes. Any news on Larry?

MR. MICHELSON: Yes. We have received his written resignation, and a copy was sent to you, but it may be in your mail somewhere.

We have informed the Chairman, and we will discuss a future course of action during consideration of new members.

MR. WILKINS: Is it possible to say what his condition is, or is it appropriate to say?

MR. MICHELSON: I could not. You have the same -- well, you haven't seen the letter yet, it's in your mail.

I couldn't decipher what it was, unless somebody has heard. Ray, have you heard anything to add to that?

MR. FRALEY: No, sir.

MR. MICHELSON: I haven't. You'll have to read it for yourself and reach your own conclusion. He apparently does have some real health problems.

MR. LEWIS: Should we send something to him?

MR. MICHELSON: Yes. If you wish, we could send one this meeting, now that we've actually received his letter. I think -- yes, I think it would be well for Ray to draft an appropriate note and we'll take a look at it. Because, until now, of course, he hadn't had the strength or the desire to write the letter. But he has now.

I think there are no other items of interest. Therefore, I'd like to -- unless any members have anything they wish to bring up at this time?

[No Response.]

MR. MICHELSON: If not, I would like to proceed with the first item on the agenda, which is the FTOL conversions, and Chet Siess is the cognizant subcommittee chairman. Chet?

MR. SIESS: The schedule has been modified to present Dresden first and then Palisades, in case you have anything that indicates otherwise.

John Zwolinski is going to introduce this, and Byron Siegel is going to give a little more background. So, if you don't know what an FTOL is they will explain it to you.

But I'd like to bring you up to date on the status of our reviews. There were six plants that had to have POLs converted to FTOLs. The process will be explained to you later.

Two of those we did in '84 and '85. That was Robert E. Ginna, and Millstone-1. We will be working on two more today, Dresden Unit 2 and Palisades. And we've got two to go, Oyster Creek and San Onofre-1. I don't know when we'll see them. The staff has had Oyster Creek on their list for the past year and a half, I think. Which it doesn't mean a thing. And San Onofre hasn't even shown up.

MR. SHEWMON: Does the staff having it on their list mean that the utility has made their submission and the staff is reviewing it?

MR. SIESS: The utility made their submission about 15 years ago. They had to apply for a full term operating licen e within three years after they got their prov''ional license. Byron will explain that process.

MR. LEWIS: He will also explain the safety implications of what we're not doing?

MR. SHEWMON: Or the 12 year delay?

MR. SIESS: Well, that will be explained. As far as the safety implications, I'll say a brief word on that.

I don't think -- I personally do not think there are any safety implications. I have not, to date, found anybody else who thought there were any safety implications. But there is a legal requirement. There has developed a tradition of a legal requirement that they must be converted. And there is a legal requirement that, since it is a licensing operation, that the ACRS has write a letter on it.

MR. LEWIS: I understand that. I just wanted you to say for the record that there were no safety implications.

MR. SIESS: Well, that's just my opinion. You know, the Committee doesn't always agree with me. But I could be wrong. Unlikely, but --

[Laughter.]

MR. WARD: Let's see. If there are to be more of these, do you have some sort of plan for making the ACRS participation a little more effective, or minimized, or something?

MR. SIESS: Well, our participation has been minimized from what it was on the other two. The staff has scaled back extensively on what they've done.

When we did the other two we had quite a voluminous SER. I didn't bring a copy of it. I didn't even look it up. But were did those right after the SEP was finished when we had the IPSAR document.

The staff has trimmed back their review process. That I think you can tell from looking at the SER. We've trimmed back ours, I think. I didn't even have a subcommittee meeting on Dresden. And we spent less time yesterday on Palisades than is scheduled today for the two of them.

But we do have to write a letter, and the subcommittee cannot write a letter, and a subcommittee chairman can't write a letter. So, we have to have an open meeting, discuss this, and see if anybody's got any problems. I'll be open to any suggestions in the future about the remaining two plants.

With that, I'll call on John Zwolinski who is AD for Region Three reactors in the NRR. He'll lead into the rest of it. Okay, John, thank you.

MR. MICHELSON: Ernest, do you have a question?

MR. WILKINS: I suspect John will address it.

MR. SIESS: We had a dress rehearsal yesterday, that is, the staff was in yesterday. I think they'll cover any questions you might have, Ernest.

[Slide.]

MR. ZWOLINSKI: Good morning. I am John Zwolinski. I am the Assistant Director for Region III Reactors. My office is physically located at 1 White Flint North here in Bethesda.

The meeting has been structured today such that the staff will be able to present an overview of the POL FTOL conversion process, it's initiation in the late '60s on through to the conversion processes taking place in the mid-'80s, as Dr. Siess alluded to, and now coming before the committee again with Dresden and Palisades.

To interject to Dave Ward, I imagine there are a number of alternatives that the committee could consider to streamline the process even further, to the extent of even waiving involvement.

I've asked Byron Siegel, our Senior Project Manager for Dresden, to provide the committee with an overview of this process. He will be up next.

Dr. Siess pointed out we've reversed our order of presentation, skipping down the chart to the Dresden discussion. We've asked Cordell Reed, the Senior Vice President from Commonwealth, to make a few comments about the Dresden Facility and Commonwealth Corporation; and Joe Eenigenburg, their Plant Manager from Dresden, is here to give an operational perspective.

Moving along to the Palisades discussion --

MR. SIESS: Excuse me, John.

MR. ZWOLINSKI: Yes, sir.

MR. SIESS: The licensee is going to be on after the staff, right?

MR. ZWOLINSKI: That's correct.

MR. SIESS: Okay. Thank you.

MR. ZWOLINSKI: The Palisades discussion, our Project Manager responsible for conducting much of the work on Palisades has been Armando Masciantonio. He will make a presentation regarding the safety evaluation, as Byron will on Dresden.

We're prepared to talk pressurized thermal shock with Barry Elliott.

Brian Holian will talk about the Palisades emerging issues, in particular the steam generator replacement, the generating company, other licensing issues that may be of interest.

We've asked Dave Vandewalle, Director, Safety and Licensing for Consumer's Power -- he's physically located at the Palisades plant -- to make comments and address the operational configuration of the Palisades plant.

MR. SIESS: Thank you. John, before we move on, I neglected to tell the committee, in Tab 2.2 you have some materials relating to Dresden and in 2.3 some relating to Palisades.

For Dresden you have a Xerox copy of a Draft Staff Safety Evaluation Report, which is, for all practical purposes, the same as the SER that was sent to you in the mail, presumably.

You also have some previous letters. The only one, I think, of any interest, is the letter dated December 13, 1982, which was the letter we wrote at the conclusion of the systematic evaluation program on Dresden-2.

You also have a draft letter, draft ACRS letter, green, that I will propose when we start writing letters, with whatever changes I make between now and then.

There is similar material in the next tab for Palisades, except for Palisades you have a bound copy of the staff's SER. What color is it? Blue.

MR. WILKINS: Mr. Chairman, I did not have my question answered during those remarks, so let me just ask it. And it's a very blunt one. Why are we doing this?

MR. SIESS: I answered that question. It's required by law.

MR. WILKINS: Does the law impose any penalties for failure to do it?

[Laughter.]

MR. SIESS: Well, yes. You can ask the applicant.

Maybe that will explain this. This does not go to the Commission. Tom Murley will issue the full-term operating license. And it will not go to a hearing, apparently. But by law, I don't think they can do anything until they get a letter from the ACRS. It's not all that clear.

MR. WILKINS: The basis for my question is, this has been hanging around, apparently, for a significant fraction of my lifetime.

MR. SIESS: Oh, yes.

MR. WILKINS: And nobody seems to care.

MR. SIESS: Right.

MR. WILKINS: Nobody seems to have cared. Let me put it that way.

MR. SIESS: Well, it's not quite that simple.

MR. WILKINS: I'm sure it isn't.

MR. SIESS: Byron is going to explain how we got into this situation. And why don't we try that and then come back? You have a good point. The first question I raised when this came up is, we have to write a letter. And I was told yes. And I don't argue with people.

MR. MICHELSON: And it has to be a committee letter.

MR. WARD: What was that last statement?

[Laughter.]

MR. SIESS: I thought I might sneak that in.

[Laughter.]

MR. ZWOLINSKI: If I may address one of the questions that was raised regarding Oyster Creek and San Onofre Unit I, we're tentatively scheduling Oyster Creek to be presented to the committee in March of next year, and San Onofre is sufficiently unguided as to maybe another year after that. I wouldn't want to be pinned down on that. I know we're moving forthrightly, though, on Oyster Creek.

MR. SIESS: They're not in your directorate, are they?

MR. ZWOLINSKI: No, they're not.

MR. SIESS: Is your directorate handling all the FTOLs?

MR. ZWOLINSKI: Byron Siegel is on my staff, and he's responsible as the lead project manager for all the FTOLs.

MR. SIESS: Oh, for all of them. Okay.

MR. ZWOLINSKI: The ones I'm most familiar with are the Region III plants; obviously Palisades and Dresden, I'm addressing.

I would like to make note that I've asked the Project Directors responsible for these plants to be here and should questions arise, we'll be more than happy to field those or supplement our presentations today.

With that, I'd like to introduce Byron Siegel.

And hopefully, he will address a couple of the questions that were raised.

MR. LEWIS: Just at the risk of being at least as blunt as my distinguished mathematical colleague, the law, of course, as I understand it, will not penalize us if we --

MR. WILKINS: Will it penalize Commonwealth Edison?

MR. LEWIS: I don't --

MR. WILKINS: Not just us.

MR. LEWIS: I don't believe so. But you know, there is a point to haggle, and I wonder whether we would conform to the law if we spent one hour instead of three hours on the subject, and then we're in a haggling mode.

You know, safety is our business, and presumably, the time we take for things that don't have safety implications takes from time we could spent on safety matters. So it's not entirely a trivial matter. But we've been through this before.

MR. SIESS: Okay, Byron.

MR. MICHELSON: Proceed.

[Slide.]

MR. SIEGEL: My name is Byron Siegel, and I'm the project manager for Dresden. I guess I'll go through this first, and then I'll answer some of your questions. Along the way, I probably will answer some of them.

Originally, there were 15 provisional operating licenses issued by the Commission, and I guess they are comparable to a learner's permit, so to speak. After approximately 18 months, they could apply for a full-term operating license. But all of them did not apply for a full-term operating license right away.

Apparently, what happened was that they authorized to some power level, and then they asked for an amendment to go to another power level, and then the 18 months started from the issuance of that amendment. So some of them, like in the case of Palisades and Dresden, actually, the POL was in effect for two years as opposed to 18 months.

In 1970, there was a rule change of the regulations that deleted the issuance of the provisional operating license. Unfortunately, when the rule change was made, everybody forget that there were some plans with POLs there, and there was no grandfather clause in it. So we ended up in a situation where essentially, there was no way of handling the provisional operating license in the conversion.

According to 10 CFR 2.109, if the licensee applies 30 days prior to the expiration of the license, then they can -- essentially, the license remains in effect until the staff takes action. Unfortunately, the staff hasn't taken action for 20 years, approximately 20 years for Palisades and Dresden. There are some reasons --

MR. SIESS: Why unfortunately?

MR. SIEGEL: Only in the sense that if it was in a timely manner, I think we could have perhaps avoided this long process that we're going through. As I'll go through here, for instance, in '77, the Commission adopted a staff recommendation that these plants be included in Phase II of the SEP program. So we had to complete the SEP review before we could issue the full-term operating license.

If it had been done in a more expeditious manner, we probably could have avoided situations like this, and this whole process probably wouldn't have been delayed. In the staff's mind, there is not any safety issue, as you all have pointed out.

But there is a purpose for doing it. One is it establishes an input for the expiration of the license. Secondly, it gets something off our books that's been on it for 20 years. Thirdly, it probably is a benefit to the licensee in the sense that what we're going to do is issue a full-term license for 40 years from the issuance of the CP.

Now, most of the new plants, the licenses are issued for 40 years from the OL. There's that CP recovery that we're talking about. Once we issue this license, then the licensee already has on the books a request to extend the license, so then we will extend this license to do the

CP recovery. In the case of Dresden, I think it's three or four years, somewhere in that time frame.

Now, there may be some economic factor that I don't know about, and perhaps Cordell, later, can address that when he gets up and talks, if he chooses to. I don't really know either for Palisades or Dresden. There may be some economic benefit for them to have a full-term license as opposed to a provisional. Perhaps it gives them better bond status. I don't know what it is, if there is any.

MR. CARROLL: What was the rationale for changing the notion of having POLs?

MR. SIEGEL: That was before my time. I guess it was felt that there was no need to issue a provisional type license; that we reviewed their qualifications at the time of the initial license submittal. We looked at the capabilities of their staff and the design of the plant. I'm just surmising that it was probably on that basis that we felt that there wasn't really any --

MR. SIESS: It was done by a rule change, was it?

MR. SIEGEL: Yes.

MR. SIESS: Then there must have been a statement of consideration somewhere. Would you like it researched?

MR. CARROLL: Not necessarily. I was just curious.

MR. SIEGEL: Okay. Commonwealth received their

POL in December of 1969. Palisades -- and I'm addressing this for both Commonwealth and Palisades, these particular slides -- Palisades was in March of '71.

In 1975, the staff stopped the review of conversions due to the backlog of GSIs and USIs, and there were a lot of other factors. There were a lot of CPs coming in at that stage later in the time frame after TMI. There were a lot of plants coming in for licensing, full-term licenses. So that also delayed the process. Probably the biggest thing that delayed is what I mentioned, the conversion -- the fact that they were tied into Phase II of the SEP.

Both Palisades and Dresden, we've written an IPSAR report, Integrated Plant Safety Assessment Report. Those were issued in -- well, for Dresden, it was the '83 time frame. Palisades, I think, was about the same time frame. Both plants, Dresden and Palisades, there were a lot of open issues in those. So once the SEP program or the SER was issued, there was still a fair amount of open items.

So, both plants, we had to issue a supplement for, and after we completed the supplement, then we did an environmental assessment for Dresden and Palisades, both this year.

Originally, there was done an environmental safety for both plants because there were no significant changes to either the site or to the facilities design itself. There was no need to do a full environmental statement, so we did what was called an environmental assessment and just updated the environmental statement to the current years, with the changes that were made since the original environmental statement was issued.

For both Dresden and Palisades, we've issued an SER which all of you have. A point of interest is Dresden 2 is essentially identical to Dresden 3, which has a full-term because the license was issue after the rule change. In fact, Cordell at one time mentioned that if Dresden 2 had come in for a license two months later, they would had a full-term operating license and not a provisional license.

MR. MICHELSON: One of your bullets deals with the USIs and the GIs. Could you tell me just briefly how they are viewed from the viewpoint of issuing this license?

MR. SIEGEL: I have some slides on that.

MR. MICHELSON: Okay.

MR. SIEGEL: There is a slide on that, if you want to see it.

MR. MICHELSON: Okay. I'll wait.

MR. SIEGEL: Okay.

MR. MICHELSON: I just wanted to make sure you were going to get into it deeper.

MR. SIEGEL: Yes. I was also asked, from a standpoint of how we handle plants that have provisional operating licenses and full-term operating licenses. There's essentially no difference. In the staff's viewpoint, we treat them equally. There's no difference. Probably a lot of reviewers and staff don't even realize they're provisional licenses. So, they're not treated any differently. They don't get any special treatment, nor do they get any treatment that affects them adversely.

I was also asked to address what the difference is between Dresden 2 and Dresden 3. The most significant difference or the only significant difference is the fact that Dresden 3 replaced the recirc piping; Dresden 2 did not. Dresden 2 utilizes hydrogen water chemistry to control the stress growth in cracking. They've had it for about four cycles. Dresden 3 doesn't need it because they obviously replace piping.

The reason that they changed the piping on Dresden 3 is I think, I believe at the time that the staff was initially looking at this, it looked like the only alternative to correct this problem on a long-term basis was to replace piping. Dresden 3 probably was the first one down the line because of their cycle sequence, refueling cycle sequence. So they replaced the piping.

Later on, the staff changed their mind, and permitted stress enhancements or improvements. As a result, Dresden 2 has now changed up, but they've gone to this hydrogen water chemistry.

MR. SIESS: Byron, let me add something there. In the SCP where the older plants -- and lumped into that group of older were all the FTOL plants, I mean the POL plants, so they'd get reviewed -- the staff had to look at a number of issues to see if the older plants met these newer guidelines or criteria. And as a result of that, some things had to be changed or documented, or procedures changed.

And in the case of Dresden-2, we were told by the utility that any changes that were required to Dresden-2 as part of the systematic evaluation program, would be made also for Dresden-3, that Commonwealth intended to keep the two plants as nearly identical as possible.

So if there were changes made as a result of the SCP, they were made to both plants.

MR. SIEGEL: I guess I would rather defer that. My understanding is that that was the case.

MR. SIESS: I'm going to address it directly with Mr. Cordell Reed when he comes up.

MR. SIEGEL: Well, my understanding, at least from the submittals that we get since I've been on the plant, which has been three years, and I think prior to that, almost all the submittals that I know of have been our dual submittals for Dresden-2 and Dresden-3, and the modifications that have been ma.e, at least to the best of my knowledge, have for the most part been the same on Dresden-2 and 3. There obviously is a lag in completion of these.

MR. SIESS: I just wanted to point out to the committee that not only did they start out essentially the same, but they've been kept essentially the same.

MR. SIEGEL: And I guess that Mr. Reed or Mr. Eenigenburg will address that.

[Slide.]

MR. SIESS: I'm not going to belabor this slide. It's just a little background. And it just gives a few of the parameters.

Dresden-2 is a BWR-3. It has isolation condenser as opposed to the high-pressure coolant-injection systems that the later plants had. The architect-engineer was Sargent & Lundy. It's got a Mark 1 containment. It's similar to Millstone, Pilgrim. Quad Cities is a sister unit that Commonwealth has, and they're very similar plants, with the exception in fact that Quad Cities does not have an isolation condenser, and Monticello is the other plant.

MR. MICHELSON: Quad Cities is a BWR-4, isn't it?

MR. SIEGEL: Yes, it's a 4. But the biggest difference probably is the fact that they don't have an isolation condenser.

MR. SHEWMON: Quad Cities always used to be a good deal dirtier primary system, and they had higher exposures of people, too. So there must be a difference in the non-primary, anyway, balance-of-plant.

MR. SIEGEL: Okay. I guess that Cordell could address that. I'm not that familiar with that, with Quad Cities, the details of balance-of-plant.

[Slide.]

MR. SIEGEL: And what we've done is, back in '88 we decided we were going to try to do something to streamline the process somewhat of how we were doing these reviews. And I guess why I'm the lead or sort of the coordinator for all these plants is because our project director was assigned the task of trying to figure out a way of shortening the process. And basically, I don't know how many of you were around when we issued the Ginna and Millstone full-term operating license. But the SERs were a lot more voluminous than they are here, essentially because they addressed all these items that we didn't address: facility improvements and modifications, which we felt weren't necessary because the staff has reviewed these from licensing submittals or 50.59 reviews; we've reviewed all the license and tech spec amendments, they've been obviously approved by the staff; and we reviewed and issues SERs on all TMI items, USIs, and SEP topics.

So basically, what we decided to address is just the TMI open items, the SEP open items, any significant open items that relate to the plant that are plant-specific in nature, and unresolved safety issues, and NMPA is in here, too.

With the exception of these SEP open issues for both Dresden and Palisades, most of these issues are common issues to not only Dresden and Palisades, but to many of the plants. So they are really not any different. They may be open issues, but they are open to a lot of plants, and we're addressing them in the same manner, in the same time frame that we're addressing these issues for the other plants. So there's nothing really unique about Dresden and Palisades in that regard.

MR. WILKINS: Excuse me. You say "other plants." These are plants that have FTOLs already?

MR. SIEGEL: That already, I'm sorry, yes, these are plants that already have FTOLs, that's correct. And most of them, to a large degree, are the older vintage plants that were pre-TMI and right after TMI, because on the newer plants, obviously, most of these issues have been addressed and closed before we issued the license.

MR. SIESS: Byron, you're handling all the plants, right, for the FTOL?

MR. SIEGEL: The remaining --

MR. SIESS: Yes.

MR. SIEGEL: Well, I'm just sort of a coordinator and overseer.

MR. SIESS: All right. But you know, there's a nasty rumor going around that the Oyster Creek is the old-style SER, yea thick?

MR. SIEGEL: That's true, because what happened was, and I should have clarified that, because at the time we made this decision, the --

MR. SIESS: You don't need to go into it now. You'll have to defend it, though, with Oyster Creek comes in.

MR. SIEGEL: Frank, take note.

[Laughter.]

[Slide.]

MR. SIEGEL: I'm sure they're going to be happy about that.

MR. SIESS: And you could mark all the pages that would correspond to the current ones.

MR. SIEGEL: What I'm going to just briefly do is go through the open issues in those four areas that I identified.

The first one is TMI open issues, detailed control room design review --

MR. SIESS: Excuse me. But there may be some people that would like to follow this in the SER. These are all addressed in the SER, but you're starting with the TMI rather than the SEP issues.

MR. SIEGEL: I didn't realize at the time I did this that they were out of order.

MR. SIESS: It's in the handout. 2.2.

MR. SIEGEL: 2.2? Okay.

MR. SIESS: The SER is in your notebook under Tab 2.2, I believe it was 2.2. I announced it earlier. And the SEP items are in Section 2. Now, can you take them up in that order at all, Byron?

MR. SIEGEL: Yes, I can, if you want to.

MR. SIESS: Okay. Why don't you just take them up in the order.

MR. SIEGEL: Which one do you want me to do first, the SEP?

MR. SIESS: SEP. The order in here is SEP, TMI, and significant open issues which are mostly GIs, I guess, and then the USIs. Okay?

[Slide.]

MR. SIEGEL: There are, for all intents and purposes, these are the three items that were open at the time the SER was written. Two of them are essentially almost closed. There's only one remaining.

Classification of structures, components and systems. This has to do with the service-level temperature and fracture toughness of the materials that were used in the plant and whether or not they've changed from the time the plant was originally designed, or the requirements of the codes ever changed since the time the plant was originally designed.

The licensee looked at this. They identified some areas that they had to review further. We're down to the point where the only one that we had a question on was the LPCI heat exchanger, the lowest service temperature for that. In the Fall of this year, the licensee provided supplemental information, and the staff is in the process of writing an SER to close that issue out. We're satisfied that in fact that their lowest service temperature is acceptable.

Seismic design considerations. We're looking at the structural integrity of the reactor vessel and internal supports to withstand seismic events. We deferred this until the review on Oyster Creek was completed, and that was just recently completed, because it's a similar plant. So we're going to try to eliminate the problem with similarity. However, there are some specific questions that the reviewer has, and the licensee is in the process of responding to those, and when we get an answer, we'll be able to close this issue out, hopefully.

Design codes, design criteria, and load combinations. The staff issued an SER in August closing that particular issue.

MR. SIESS: Just to get something straight, as I read it, when we reviewed the IPSAR for this plant, there were a number of open issues.

MR. SIEGEL: That's correct.

MR. SIESS: Which we said at that time, the resolution was, we accepted them, what the staff was proposing to do. Right? Since that time, all but three of those have been resolved.

MR. SIEGEL: That's correct.

MR. SIESS: So these three items are the leftovers from the IPSAR?

MR. SIEGEL: They're from the supplement, yes.

MR. SIESS: Supplement I. Yes. Okay. Now, there were a lot of them open at the time of the IPSAR.

MR. SIEGEL: That's correct.

MR. SIESS: And then we got Supplement I, which had all but three resolved, and these are the three remaining. This rounds out the picture.

MR. SIEGEL: That's correct.

MR. SIESS: Okay. And as of this time, there are still two in the process of being resolved.

MR. SIEGEL: Yes. One of which is, for all intents and purposes, resolved, we just don't have an SER yet on it.

[Slide.]

MR. SIEGEL: The next one that we want to address are the TMI issues.

At the time that the SER was completed -- and also, I -- okay. At the time the SER was issued, there were three or four TMI open items.

Detailed control room design. This has to do with essentially annunciator modifications and they are what are categorized as Category 2, Levels B and C items, which have minimal, if any, safety significance.

The licensee has completed -- I don't the percentage -- a very large percentage of the program. These are things that the licensee has had a problem completing for several reasons.

They have a limited amount of time to do this. They have to do it during a refueling outage. The panels that these are in are very close quarters. They can only have a couple people in them at a time.

And they don't want to rush it for doing it during the outages because they don't want to cause some problem where they end up tripping or hitting alarms.

So, they also had some problems with getting the annunciator alarms themselves in panels in types that they wanted.

So, the staff has reviewed this. We reviewed it several years ago, and don't consider it a safety significant issue. The licensee has been keeping us apprised of what they are doing and their schedule for completion.

MR. SIESS: Byron, you may not know the answer. But if you don't, somebody else might. Is there any plant, in the United States for which the detailed control room design review has been completed and approved?

MR. SIEGEL: I do not know the answer. I suspect there are, but I don't know how many.

John, do you know?

MR. ZWOLINSKI: Dr. Siess, I'm aware that there are several plants. I can't list them off the top of my head. I'll be more than happy to furnish you a status report on that.

MR. SIESS: I'd just be interested. Because I keep seeing references to it every time I look at anything on a plant. And I just wondered if anybody has ever done it all.

MR. ZWOLINSKI: The key thought was one of prioritization of the human engineering discrepancies into Categories A, B and C, with A being safety significant.

And many, many licensees have indeed completed the safety significant improvements. We do track each plant at the Category A, B and C level. And we can furnish that particular report to you.

MR. SIESS: Is that in the GIMICS?

MR. SIEGEL: I think it's closed in that there would be -- wouldn't. Wouldn't be closing GIMICS?

MR. ZWOLINSKI: I believe it is closed in GIMICS. We retain an internal tracking system on that.

MR. SIESS: Okay.

MR. SIEGEL: I should mention that the licensee has done extensive control room design modifications. Put in new ceilings and a lot of modifications.

MR. SIESS: Oh yeah, I know. I know everybody has done a lot. I just wondered if anybody had done them all.

MR. SIEGEL: Okay.

MR. CARROLL: Well, of those that remain to get signed off, are they generally like this one?

MR. ZWOLINSKI: Generally speaking, yes, sir.

MR. CARROLL: Completing annunciators, or getting a few additional instruments, or whatever?

MR. SIEGEL: For the most part, they are the less significant ones, I believe, for most of the plants. And that's why this schedule has been allowed. We haven't had that much problem with the slipping of the schedule.

Instrumentation for the detection of inadequate core cooling. This is an issue that is common to most of the BWRs, too. This has to do with rerouting the reactor vessel level instrumentation so that you get more accurate readings. So that the slope is such that you don't get, I guess, sloshing in the -- and a large temperature change gradient so you'd get flashing.

They're in the process of doing this particular modification. It's going to take two cycles, one to go in and make the penetrations and take measurements, the other one to actually do the installation.

Upgrade of emergency preparedness. This basically has to do with just meteorological data and the utilization of improved model for calculating meteorological data. They have a model in place, but this is an improved model.

Post accident monitoring instrumentation. Installation of neutron flux monitoring instrumentation that meets the requirements of Reg Guide 1.97, and 10 CFR 50.49.

This is installation of a Class 1-E neutron flux monitoring instrumentation. This is a generic issue for all the plants. I believe there are two plants that actually have this instrumentation installed.

The rest of them, there is a discussion between the owners group and the staff with regard to the requirements for how far beyond post accident monitoring, beyond the design basis event you'd have to have this instrumentation operable.

I believe the owners group met with Dr. Murley on this issue, and a decision is forthcoming shortly on that. So, that's a common issue to most of the BWRs.

MR. KERR: I see Regulatory Guides now make requirements rather than providing guides.

MR. SIEGEL: I won't comment on that.

MR. KERR: Reg 1.97 sure does.

MR. SIEGEL: Reg 1.97 is a requirement, though. That's true.

[Slide.]

MR. SIEGEL: Significant open items.

MR. CATTON: Is there anything in Reg 1.97 that lets them know when the vessel fails?

MR. SIEGEL: I think that there is containment instrumentation. Yes, I would think so. Because there is containment instrumentation under pressure. And then, likewise, I would assume that if there was a failure of the vessel you would get it from that.

MR. CATTON: Nothing like a temperature measurement, then?

MR. SIESS: No.

MR. SIEGEL: Not that I know of, no.

MR. SIESS: We didn't think of that.

MR. CATTON: Huh?

MR. SIESS: We didn't think of that when we made the list.

MR. CATTON: I didn't think it would, either. But there was an accident management workshop, and I asked one of the people from the utility that owns BWRs, if they knew when the vessel failed, and they said no.

MR. SIEGEL: Well, I don't think you'd know. It would feel like a break, a part break, where you would get th same indications on the instrumentation.

MR. SIESS: I don't think that's true, because if you had a core melt and you've depressurized, I'm not sure you'd --

MR. SIEGEL: He was just asking if the vessel failed. He was not -- or I didn't think he was trying to referring to a core melt.

MR. CATTON: Following the cooling.

MR. SIESS: I think the answer is no.

MR. SIEGEL: No. After the fact, yes. Prior, no.

These are just significant open items that are related to Dresden. Some of them are common to all plants. There are one or two that are more plant specific.

Intergranular stress corrosion cracking was an open item.

MR. SIESS: All are common to two and three, though.

MR. SIEGEL: I'm sorry, what? Yes. I should have qualified that. That's right, Dr. Siegel.

All these items that I've addressed here, with the exception of the SEP items are common to Dresden 2 and 3.

MR. SHEWMON: What's the staff's position on repeated or many cycle operation with crack repaired -- I want to say repaired cracks and primary piping? That used to give them heartburn, and the utilities argued.

MR. SIEGEL: Well, we -- if they follow -- We've approved in an SE their response in generic letter 88-01. There is a procedure in 88-01, a testing inspection procedure that they have to follow.

MR. SHEWMON: And they can inspect, and have demonstrated that they can inspect through weld repair of cracks?

MR. SIEGEL: I believe so, yes. And the staff has permitted these types of repairs.

Every cycle, they go in and do an inspection according to the program in 88-01. If they find defects they have to do an expanded program, inspection program. They come in and tell us what --

MR. SHEWMON: If the crack is there, they know the crack is there, they know where to look for it. The only question is whether they can do an adequate inspection through the overlay.

MR. SIEGEL: The cracks aren't there --

MR. SHEWMON: They are there or they would not have done the overlay.

MR. SIEGEL: Well, they've ground out all the crack indications, so that --

MR. SHEWMON: Not for an overlay, is my impression.

MR. SIEGEL: They don't do the -- I guess I don't know the answer to that question.

MR. SHEWMON: Barry Elliott was alleged to be in the audience.

MR. ELLIOTT: Barry Elliott is here. We do a cycle by cycle review. We look at the inspection results.

MR. SHEWMON: But they can do an inspection through the overlay that is --?

MR. ELLIOTT: I don't know adequate it is. It's adequate enough so that we can go from cycle to cycle. That's all we're doing on the repairs.

MR. SHEWMON: Now, it's my impression that --

MR. ELLIOTT: It's difficult to go through -- it's very difficult to inspect the weld.

MR. SHEWMON: Let me finish the question, please?

MR. ELLIOTT: Okay.

MR. SHEWMON: It's my impression that the ones they do overlays on they have not ground out, am I wrong on that?

MR. ELLIOTT: That's -- that's. No, you're not wrong on that. In fact, that is absolutely true. There are cracks and there are still --

MR. SHEWMON: The question is, the adequacy of an inspection through an overlay.

MR. SIEGEL: I think the answer to your question is they don't. I think when you do the inspection I don't think you see those cracks anymore when you do the inspection.

MR. SHEWMON: Then how can you do an inspection? You know the crack's there. You must be able to see something.

MR. SIEGEL: Joe, do you know the answer to that?

MR. EENIGENBURG: Yes, sir. Joe Eenigenburg from Commonwealth Edison.

We do weld over cracks, and the cracks are in the base metal. The base surface of the metal is excavated and we have a clean surface to begin the overlay on, on the pipe.

We then, after building the overlay up to the specified thickness, the overlay is surface conditioned for ultrasonic inspection.

MR. SHEWMON: Which means ground smooth, is that right?

MR. EENIGENBURG: Ground smooth.

MR. SHEWMON: Yes?

MR. EENIGENBURG: We then can see through the overlay and down to that original unflawed base material surface. That weld overlay is inspected for, I believe it is three cycles. And, if there is no indication of crack propagation into the weld overlay, then we resort to the normal inspection frequency.

MR. SHEWMON: So, you do not look at the existing crack, but you look to see if there is a new crack in the weld overlay, and that you can do reliably. Is that the argument?

MR. EENIGENBURG: That is correct.

MR. SHEWMON: Okay. Thank you.

MR. SIEGEL: When they do find cracks, they come into the staff, tell them where they found them, identify them. The staff and the licensee agree upon an expanded inspection program to determine what's acceptable, and then they tell the weld repair, and we approve the weld repair, the nature of the weld repair.

Control room habitability, there is a tech spec amendment in place for installation of a -- for the installation of a new control room emergency air-filtration system.

Combustible gas control I will discuss later under the USIs, and the same with station blackout.

Hardened wetwell vent was an issue for all the BWR Mark 1s.

Because Commonwealth and several other plants had isolation condensers, they didn't think there was a need for it, and they responded to the staff's request by saying they didn't think there was a need. They came in, had a meeting with us.

The staff did an analysis and determined there was cost benefit and, also, in having them install it. We wrote a letter back to them, and then the licensee wrote a letter in September 24, 1990, confirming -- or we wrote a letter to them confirming their commitment from a previous letter.

MR. CATTON: When you did your cost benefit, what kind of assumptions did you make about the Mark 1 liner melt-through?

MR. SIEGEL: I cannot answer that question. I don't know the whole basis.

MR. CATTON: It certainly changes the basis that you're dealing with. I'd be interested in finding out. What did you do about the melt-through of the liner in your cost-benefit analysis?

MR. ZWOLINSKI: We'll be happy to provide that cost-benefit analysis. I don't have the answer to that particular question.

MR. CATTON: Okay. I don't want the whole thing. I just want to know what you did with that one piece. You had to say something about it in doing your cost-benefit. And what was your assumption?

MR. SIEGEL: I don't think it was a question of was it a liner melt-through? I don't think it was from that basis. I thought it was a rupture of the containment, the primary containment, and that was the purpose of the venting. I don't think it was a melt-through considered.

MR. CATTON: Yes. But if you melt through the liner, I'm not sure how much good the vent does you.

MR. BARRETT: I believe the cost-benefit analysis was not based on the core-melt scenario.

My name is Richard Barrett.

I think it was based more on preventing a core-melt accident as a result of a loss of containment heat-removal capability. So, in that case, the liner melt-through would not be a major factor in the analysis. But I am not certain of that fact.

MR. SIESS: Would you simply send us a note telling us where -- identify the document that has the cost-benefit or the value-impact analysis?

MR. SIEGEL: We'll provide you a copy of it.

MR. SIESS: Okay. This is generic, isn't it?

MR. SIEGEL: This was a plant-specific one. We did -- for the four or five plants that was involved, there was a plant-specific cost-benefit analysis done for each plant.

MR. SIESS: What made it plant-specific, the remaining life of the plant?

MR. SIEGEL: The remaining life of the plant was a part.

MR. SIESS: Okay. So, what was considered was generic.

MR. SIEGEL: There were other parameters involved in it that were plant-specific, too, I believe.

MR. ZWOLINSKI: The principal difference was the fact that these were a group of plants that had isolation condensers.

MR. SIESS: Okay.

MR. ZWOLINSKI: And the analysis performed addressed those particular plants. It used as its foundation the Millstone-1 PRA.

MR. SIESS: I am just trying to find out whether we're asking you for the name and title and date of a generic document or the name, title, and date of a --

MR. SIEGEL: It's a plant-specific document.

MR. SIESS: -- plant-specific document.

Which would you rather have?

MR. CATTON: I think I am interested generically.

MR. SIESS: If you can identify five plant-specific documents, please send us a notice, and we will get them.

MR. SIEGEL: Yes, sir, Dr. Siess.

MR. SIESS: Thank you.

[Slide.]

MR. SIEGEL: The next area is unresolved safety issues.

On ATWS, there is an issue that's generic to almost all the BWRs. It has to do with diversity associated with the alternate rod injection and reactor pump trip, analog trip units.

This is escalated -- the staff does not feel -- the units that are in question are made by the same manufacturer. There are some differences between them, but they're made by the same manufacturer.

The Owner's Group has escalated this all the way up the EDO's office. The EDO took a position that he agrees with the staff that the licensee should provide diverse alternate trip units, and that's the status of that issue at this point in time.

Station blackout: We have reviewed the licensee's response, and we're in the process of issuing the -- the SER has been written. We're in the process of sending the letter to the licensee. They have essentially agreed.

The Dresden Station has three diesel generators, currently. They've got one dedicated unit, one dedicated diesel to each unit, and then a swing diese`

They have agreed to put in a non safety-grade fourth diesel generator that can handle the loads for both units in the event of a total station blackout.

MR. SHEWMON: What was the word you use?

MR. SIEGEL: Fourth. I'm sorry. A fourth diesel generator that's a non-Class 1-E.

MR. CARROLL: And this fourth diesel can handle all unit loads.

MR. SIEGEL: For both units. It can handle -- in the event of a total station blackout, where you lose all the other three diesels, it will handle the load for both units.

MR. CARROLL: Both units?

MR. SIEGEL: That's correct.

MR. SIESS: You're going to lose the three safety-grade diesels, and the non-safety-grade diesel will take over.

MR. SIEGEL: That's correct.

MR. SIESS: That's good. Maybe they ought to be all non-safety-grade. Then you wouldn't lose the three in the first place. That's logical to me.

MR. CARROLL: Now, this fourth diesel, tell me about its protection against tornadoes and things like that.

MR. SIEGEL: I don't know the specific -- I am not the person that reviewed it. Since it's a non-Class 1-E, am not sure that it needs to meet that requirement. I think the probability of having that type of event coupled with a tornado that is going to wipe them all out is --

MR. SIESS: What type of event coupled with a tornado?

MR. SIEGEL: I'm sorry. What?

MR. SIESS: What type of event were you coupling with the tornado that's improbable?

MR. SIEGEL: I was saying that the combination of the tornado wiping out -- I'm just surmising, and I guess I should -- I am not sure of the answer, but I would --

MR. SIESS: If it's a non-safety-grade diesel, it probably has not even been looked for tornadoes. That's what makes it non-safety-grade.

MR. CARROLL: I don't know why tornadoes and Dresden come to mind.

MR. SIESS: For those that don't know, a tornado once made a circle around Dresden and took out all of the offsite power.

MR. SIEGEL: That's something I didn't know.

MR. SIESS: But did not take out the diesels, didn't stop them.

MR. SIEGEL: Seismic qualification of equipment in operating plants: Their specific requirements and approach for implementation are being jointly developed by the staff and the seismic qualification crew. That, again, is a generic issue common to more than just the Dresden Station.

Safety implementation of control systems: The licensee's submittal is under staff review. They have a high level -- as per A-47, they do have a high level -- a trip on high level, high reactor vessel level, and the staff is reviewing the acceptability of what they have.

MR. MICHELSON: Is it a safety-grade trip? By "trip," I assume you mean feedwater.

MR. SIEGEL: Yes, on feedwater, yes.

Joe, do you know if it's safety-grade? My recollection is that it isn't, but do you know if it is or not, the high-level trip?

MR. EENIGENBURG: Is not.

MR. SIEGEL: Is not. That's what I thought. Okay.

MR. MICHELSON: Before you leave that, the staff review is going on. How does the outcome, in any way, affect the FTOL?

MR. SIEGEL: How does the outcome --

MR. MICHELSON: Of the review, since it's ongoing and the FTOL is more eminent?

MR. SIEGEL: Well, I think this is -- you know, this, again, I think, is not an issue that is --

MR. MICHELSON: It's not an FTOL issue.

MR. SIEGEL: It's not an FTOL issue. It's not an issue that just --

MR. MICHELSON: It will just be resolved when you get done with your review, and they'll do whatever the resolution might be.

MR. SIEGEL: Whatever the resolution is will be common. There will be consistency between plants that are currently licensed and those that aren't.

MR. MICHELSON: Okay. And it's not an FTOL issue. I wasn't sure, because you listed it here as issue.

MR. SIEGEL: All I was doing here is essentially apprising the Committee of what I considered unresolved safety issues that had some significance, and I was trying to stress before the point that these are not necessarily only common to Dresden, but I was just trying to get you an idea of the scope.

MR. MICHELSON: Do any of these have a potential impact on an FTOL?

MR. SIEGEL: No, because they are all being treated for all the plants.

MR. MICHELSON: It's just for our information.

MR. SIEGEL: For your information, basically.

That's correct.

Hydrogen control is probably the one that comes -- it's not really plant-specific, but it's an issue that's involved, again, with four or five licensees, and this has to do with determining whether or not they satisfy the requirements of 50.44.

This is an ongoing issue for many years. The staff recently made it -- took the position that the licensee does not meet the requirements of 50.44, and we've set up a meeting to -- or we have written them a letter just this month -- or I guess it was dated November -- requesting a meeting with them within 60 days to discuss this issue.

MR. SIESS: This is the issue of whether inerting satisfies 50.44?

The reason I ask is we were discussing something the other day, it might have been two of us talking and somebody said, well, inerting solves the hydrogen problem. But inerting doesn't solve the hydrogen problem.

MR. SIEGEL: It depends on whether you use the licensee's method of calculating the hydrogen generation.

MR. SIESS: As far as the Staff is concerned, inerting doesn't solve the hydrogen problem.

MR. SIEGEL: That's correct.

In the Staff's view if you use the assumptions in Reg Guide 1.47 --

MR. SIESS: And you no longer accept CAD, Containment Atmosphere Dilution.

MR. SIEGEL: No, if they have an NCAD system, Nitrogen Containment Air Dilution system, that's acceptable. We aren't accepting ACAD, which is an Air Containment Air Dilution system, an atmospheric system.

We don't feel that that enhances the safety of the plant because it's still combustible if there's hydrogen.

MR. SIESS: These are considering only LOCAs or do you have to get into severe accidents to find out?

MR. SIEGEL: Our interpretation of 50.44 or for addressing it is they have to go beyond design basis accidents.

MR. SIESS: So at the time we accepted CAD we accepted inerting several years ago. That was okay for a LOCA?

MR. SIEGEL: We accepted the ACAD system at the time the plant was licensed and then TMI came along and we've changed our position on that and feel that they have to go beyond design basis accidents and that on that basis and the amount of hydrogen that's being generated an ACAD system is not acceptable.

MR. SIESS: So the regulations have not been changed but the interpretation of the regulation for what kind of accidents has changed without changing the regulation?

MR. SIEGEL: That's correct, and that's why the issue has been dragging on so long. We just came up with a position that whether or not they met the requirements of 50.44 -- this was on Oyster Creek, which is sort of the lead plant -- and --

MR. SIESS: That's an interesting legal question, since 50.44 obviously was written before we were thinking of those particular severe accidents.

MR. SIEGEL: That's correct and that's why it's been such a sticky issue, I believe, in part.

MR. KERR: So the Staff now has the capability of changing regulations without changing them?

MR. SIEGEL: I don't think I am going to touch that one.

MR. KERR: Well, that's interesting, I mean --

MR. SIEGEL: There is a document that I gave you that's rather interesting. It gives the whole litany of the process and how we got where we are on this.

MR. SIESS: That's the Oyster Creek analysis?

MR. SIEGEL: I'm sorry, what?

MR. SIESS: The Oyster Creek analysis.

MR. SIEGEL: Yes, the Oyster Creek scenario.

MR. SIESS: I don't know whether everybody has it but if they are interested we can certainly get it for them.

MR. SIEGEL: It's a very detailed, in-depth description of how we got to where we are now essentially, if you are interested in pursuing it.

MR. SIESS: You have a question or you're nodding?

MR. CARROLL: I would like to get a copy of it.

MR. SIESS: Dean, was that included in the package you sent out to everybody?

MR. HOUSTON: It is in the FTOL.

MR. SIESS: Oh, just to the subcommittee? Okay. Will you take care or somebody to get it to everybody, including the ones you already sent it to who probably can't find it.

[Slide.]

MR. SIEGEL: I am just going to briefly put up this slide on Conclusions and carefully avoid some of the conclusions we had discussions in subcommittee about -- where some of these came from and they came from 50.57.

The Staff basically feels that it's not a safety issue and that we should issue the license.

MR. LEWIS: You are not going to get away with trying to pass up that issue, so don't even try!

[Laughter.]

MR. SIEGEL: I guess I would like to point out that D-3 is an identical plant which has been issued an FTOL. D-2 has had 20 years of successful operating experience and I'll briefly touch upon that and then the licensee will discuss that in detail.

On the basis of the fact that it isn't a safety concern and the fact that they do have much operating, successful operating experience and there is a plant on the same site that is for all intents and purposes identical, the Staff recommends that we should issue an FTOL for Dresden.

I've got one more slide.

MR. LEWIS: But before you do it, let me just put on the record that other question that did come up. Leave it on, please --

MR. SIEGEL: Sure.

MR. LEWIS: -- that came up in the subcommittee meeting. I call your attention, members of the Committee, to bullets 3 and 5 because bullets 3 and 5 say that the activities authorized, that is the operation of plant, can be conducted without endangering the health and safety of the public.

Our normal letter says "without undue risk to the health and safety of the public," which entails the possibility that there is risk but acceptable, whereas this says there is no risk, which is manifestly false.

The same thing appears in bullet 5. Now the Staff found yesterday that bullet 5 comes directly from 10 CFR

50.57, so part of the sin pre-dates -- what?

MR. SIEGEL: As a matter of fact, all of these do.

MR. LEWIS: So there is a conflict between the wording we have always used and this wording.

MR. SIESS: We can find our words also, if you look enough. The words we use can also be found in the regulation.

MR. SHEWMON: It's like the Bible. You keep looking long enough and you can find it restated.

MR. LEWIS: I don't think I would have compared it to the Bible but I defer to your judgment. It seems to me this is a non-trivial issue because whereas we may slough over it and say, hey, we mean the same thing, I could imagine a lawyer going to town on this distinction because to say that there is no risk is indefensible -- it says "without endangering."

If I were a lawyer I would interpret that as no risk.

MR. SIESS: I am so happy you are not a lawyer.

MR. SHEWMON: We could argue thresholds.

MR. LEWIS: We could but it is not contemplated there.

[Slide.]

MR. SIEGEL: I was going to give a little operating history of Dresden from the Staff's perspective.

Dresden was put on the watch list in 1987 as a result of safety system outage management --

MR. SIESS: Excuse me. Again, Dresden means both units.

MR. SIEGEL: That's correct.

MR. SIESS: I have to keep reminding you of that because we are only reviewing one unit.

MR. SIEGEL: Okay. That's true, but it does apply to Dresden 2.

-- as the result of the diagnostic evaluation team, the many SCRAMs, poor radiation procedure, protection practices and poor maintenance.

Dresden essentially recognized this problem in '86 and starting taking corrective actions.

They made management changes, initiated improvement programs including maintenance programs directed at plant safety and performance including the change in the plant manager and some of the plant staff.

MR. KERR: When you talk about poor maintenance, as compared to what?

MR. SIEGEL: I guess in speaking for the region it would probably be maintenance practices as we perceive them relative to all the plants and what we consider as acceptable maintenance practices. We have the region and the inspectors have their own baseline for what they think is acceptable maintenance.

MR. KERR: So it was below average, in other words.

MR. SIEGEL: That's correct.

MR. KERR: So you would want all plants to be above average!

MR. SIEGEL: No. No, I think it's relative --

MR. KERR: I'm trying to find out how --

MR. SIEGEL: I think we felt it was, that their maintenance practices were unacceptable or they weren't good. I won't say unacceptable or they wouldn't be operating but they were not as good as they should have been. That resulted, their performance --

MR. KERR: I am trying to find out what you use as your standard for "good."

You first said it was I thought the average of plants in the region.

MR. SIEGEL: Well, on an overall basis, yes, okay? In specific areas there are peaks and valleys in any average. In the areas of maintenance they were below average probably.

MR. KERR: I'm sorry. I didn't know before that an average had peaks and valleys in it.

MR. SIEGEL: I was talking about their overall plant performance and if you look at their overall plant performance, in some areas they were better.

MR. KERR: I am looking at maintenance and I am told that the maintenance was poor.

MR. SIEGEL: Yes.

MR. KERR: I am trying to understand what the basis for "poor" is. What was --

MR. SIEGEL: Unfortunately this was before my time. The region isn't here to address that.

MR. ZWOLINSKI: Let me just comment, not to make this a maintenance presentation but there are set parameters that the licensee would evaluate unto themselves that they found unacceptable. This is an area of rework -- their procedures, staff training and Agency's during its inspection confirmed the licensee findings.

As you can tell from the slide, the licensee self-identified the maintenance practices as being below their standards in 1986.

Our diagnostic evaluation team confirmed that in June of '87 time period.

MR. KERR: So, so you are telling me that it was not -- the NRC didn't identify maintenance as being poor. The licensee did and you agreed with them.

MR. ZWOLINSKI: I think that's the flow of information.

MR. KERR: Oh!

MR. ZWOLINSKI: We recognized shortcomings, as did they.

MR. KERR: I thought it was something that the NRC had done.

MR. SIEGEL: I think a combination of events like this identifies ended up and then being put on the watch list. Maintenance was one of the items that went into that input to make that determination.

MR. KERR: So if a licensee comes in and tells you that their maintenance practices are poor, you agree with them and put them on the watch list. That's not unreasonable.

MR. SIEGEL: I think it's over-simplification. I think the inspectors from the region go out, the resident inspector goes out and looks. These are discussed on a yearly basis and they're factored into the SALP input. At some point in time, we get sensitized to the point where, the region does and the staff, that there's a problem and you can't just make that simple statement that you're making and say that that's the fact.

MR. KERR: I am trying to get you to tell me what the alternative is. If you will tell me what the alternative is to what I'm saying, I'll accept it.

MR. SIEGEL: I don't know the basis for the region's determination, because unfortunately they couldn't make it.

MR. KERR: So it is a reasonable determination and it might be different in different regions.

MR. SIEGEL: They're primarily the ones that would be best -- that could best make that determination.

MR. KERR: Thank you.

MR. SHEWMON: On that issue, as I recall a few years ago, and my memory lapses as to how many, Commonwealth came in and talked about a new more central maintenance training facility which they had set up, probably not far from the Dresden plant. Do you know when in time that came in relative to this event? That is the No. 3 on the SALP.

MR. SIEGEL: The new facility that I think you're talking about is under construction or almost completed now.

MR. SHEWMON: There's a training facility, but I'm not sure that's training for the maintenance.

MR. REED: 1981-1982.

MR. SIEGEL: 1981-1982.

MR. ZWOLINSKI: That is the production training center which all employees of the Commonwealth Edison system have an opportunity to attend training on an annual basis.

MR. SHEWMON: That includes maintenance.

MR. ZWOLINSKI: Yes, sir.

MR. SHEWMON: That started, then, eight years ago, well before this event.

MR. ZWOLINSKI: Yes, sir.

MR. SHEWMON: Thank you.

MR. SIEGEL: Prior to 1986, again, we would describe the licensee as an average performer, having ups and downs in the areas that we reviewed them for SALP. Since October 1987, Dresden has demonstrated sustained plant performance probably better than they have ever before. Mr. Eenigenburg, who is the station manager, is going to give you a little presentation to show you where they've come in the past three to four years.

The SALP ratings that we --

MR. CARROLL: I'm not following all this chronologically. They were an average plant --

MR. SIEGEL: Prior to 1986.

MR. CARROLL: And, yet, got put on the problem plant list?

MR. SIEGEL: That was prior to 1986. There was a point starting in the 1985-86 timeframe where they were running into a lot of problems and they ended up being put on the watch list. They identified this -- at the time they were being put on the watch list, probably they were starting to turn around the problems that they had, but they hadn't shown up yet. The corrections had not really made their full impact.

MR. CARROLL: But if I read this literally, at that point in time when they were put on the watch list, their track record had been average.

MR. SIEGEL: Yes. Prior to 1986, I would say back from the 1984-85 timeframe, from, say, 1970 to 1984 timeframe, yes. They were about average.

MR. SIESS: That's prior to 1985, then.

MR. S..GEL: Yes. This probably should be not 1986, but probably 1984-85 timeframe.

MR. MICHELSON: The SALP is always looking backward.

MR. SIEGEL: That's correct.

MR. MICHELSON: The SALP ratings in 1986 were really reflecting 1984-85 experience, weren't they?

MR. SIEGEL: That's true.

MR. MICHELSON: They were average, I think, was the point. They looked to be very much average in that timeframe.

MR. SIESS: It doesn't say here that these are SALP figures. It just says they were an average plant.

MR. SIEGEL: No. But he's looking down at the bottom here where I've identified --

MR. SIESS: That doesn't have prior to 1986 on it. Let me ask him. Is the statement in your third paragraph based on SALP or is it based on other types of information?

MR. SIEGEL: It's primarily based on SALP.

MR. SIESS: That helps me.

MR. MICHELSON: It is true that the SALP ratings for 1986 are based on 1984-85 experience. They always have to be based on past. Not even 1986.

MR. SIEGEL: They're probably in a year-and-a-half cycle, somewhere between 12 months and 18 months.

MR. CARROLL: Do you know what the two three's on SALP 6-1986 were in?

MR. SIEGEL: I don't remember. I don't have it with me. No, I do not. I think one of them was in maintenance. I don't know where the other one was. Joe, do you know?

MR. EENIGENBURG: I believe it was fire protection.

MR. SIEGEL: One was maintenance, though, wasn't it? But if you look from 1986 through 1990, you can see that they've gone from one to -- in SALP ratings, they've gotten three one's in 1990. The significance of this is the fact that both in the SALP 8 and SALP 9, they've gotten one in operations, which is unusual. The region does not give one's \in operations very often.

So their operations have improved, as Mr. Eenigenburg will tell you. In 1990, they got three one's, they got four two's, one of which was a two-improving, and no three's. So they've had a significant improvement starting from the 1986 timeframe up to the current. The current cycle that they're in or the current SALP period that they're in, the performance is consistent with -- it appears to be about consistent with what we gave them in the last SALP.

With that, I will turn over the microphone to Cordell Reed. I included a corporate management overhead so you can see where Mr. Reed and Mr. Eenigenburg are on the Commonwealth Edison corporate structure.

MR. SIESS: Thank you. Before he leaves, any further questions?

[No response.]

MR. SIESS: Welcome, Mr. Reed. It's been a few years since we've seen you in here. I guess it might be a while, since I noticed Carroll County you gave up on.

MR. REED: Good morning. My name is Cordell Reed. I'm Senior Vice President for Nuclear Operations at Commonwealth Edison. I'm happy to have the opportunity to come here this morning by invitation of the staff, to be an advocate for our full-term operating license on Dresden Unit 2. I was a startup engineer at Dresden from 1967 to 1971 and most of my professional career has been associated with it. So I thought it was only appropriate that I be here.

Listening to the tenor of the conversation, I can presume that a long discussion is not what you're interested in. We've just directed Joe Eenigburg, who is our station manager, to kind of get his presentation down from ten minutes to five minutes. I had come mostly in order to be able to answer questions that you might have about the rest of our plants.

Just before Joe, you did raise a couple issues that maybe I can clarify. Indeed, after the Dresden 2 SEP, the modifications that were indicated, we did make those modifications not only on Dresden Unit 3, but also on Quad Cities Units 1 and 2. Paul, as you had indicated, there are differences between Dresden and Quad Cities. In terms of Quad Cities' plant being hotter, at Quad Cities we have a two percent cleanup system as opposed to a seven percent system at Dresden.

We have a deep bed resin system at Dresden as opposed to Powdex at Quad Cities. It has imposed upon us some real challenges at Quad Cities, but I think we've faced those. At one time we had the highest man rem of any two-unit plant at Quad Cities, according to INPO, and I think that was back in 1985 or so. Then we were proud two or three years later to come up with the lowest man rem of any two-unit plant. So we've been doing some loop decontaminations to get us to that point.

Possibly it would be better if Joe gives his presentation directed at our operating performance. We were put on the watch list and I might tell you in early 1986, it was INPO that performed an evaluation at Dresden. They rated the plant as five, the lowest rating you can have. We had just come out of a nine-month outage of replacing the piping on Dresden Unit 3. Our maintenance was not according to what we wanted it to be. Our programs were not formal. We didn't have enough work planners and it was really that endeavor that started Commonwealth Edison to say that Dresden Station was not at the level that we wanted to be at.

The DET came into Dresden, I guess, the latter part of 1986 or so.

MR. CATTON: What is the DET?

MR. REED: The Diagnostic Evaluation Team of the NRC. And they, indeed, confirmed many of the problems that were identified by INPO and identified by ourselves. Some of the items they came up with added to our integrated approach. So I won't complain that we were misclassified by the NRC. We had classified ourselves and made a commitment on Dresden to improve its performance, and we're pleased with the progress we have made. That's what Joe will address. Then I will come back and answer any questions you might have. Joe?

[Slide.]

MR. EENIGENBURG: Good morning. I can assure you, as I was one of the engineers who was involved in the preparation of the initial full-term operating license submittal for Dresden Station back in the 1972 timeframe, that I had no idea that 18 years later I would be making a presentation before ACRS in pursuit of this full-term license.

[Slide.]

MR. CATTON: Were you able to use any of your initial viewgraphs?

[Laughter.]

MR. WILKINS: I doubt if they were in this multi-color format.

MR. EENIGENBURG: Although I can tell you that every engineer enjoys seeing his work finally come to fruition. Very briefly, I will talk about current unit status of both units at Dresden, our overall improvement evolution, some of our facility upgrades. I have a short carrousel with some slides of the plant that I could give you a very quick plant tour.

In the interest of time, I'm going to skip over most of the programmatic improvement items that are included in your handout. If there are any you'd like to dwell on in particular, we could easily come back to them. Then I'd like to show you some overall performance trends.

[Slide.]

MR. EENIGENBURG: Unit 2 is current shut down and we are in its 12th refueling outage. We are approaching the end of the outage. We're expecting to have the unit back on-line by Christmas. We're in the process now of reactor reassembly. The core has been reloaded. We are anticipating doing the primary system hydrostatic test this Sunday. We yet have to do the primary containment integrated leak rate test, but the bulk of our outage is behind us.

MR. SHEWMON: That hydrostatic test is done at a few percent above operating pressure and hot or do you know those details?

MR. EENIGENBURG: Yes. It's done at ten percent over normal operating pressure. In our case, that's 1,100 pounds as opposed to a normal operating pressure of nominally 1,000 pounds. It's done just at 200 degrees.

MR. SHEWMON: And you operate at?

MR. EENIGENBURG: 545.

MR. SHEWMON: Thank you.

MR. CARROLL: Is that with the safeties gagged?

MR. EENIGENBURG: Yes, sir. Safety valves are gagged and overpressure protection is provided during the course of the hydrostatic test by a relief valve on the shutdown cooling system. It is a solid primary system hydro. There are no air bubbles.

[Slide.]

MR. EENIGENBURG: Unit 3, by comparison, today is at full load and has been for the last 154 days. It has been 271 days or a little over nine months since we've had an automatic scram on either of the two units.

[Slide.]

MR. EENIGENBURG: As has been mentioned, our improvements began in the mid-1986 timeframe, led both by the NRC's safety system outage modification inspection that had been performed, followed shortly by an INPO evaluation, and both of those, coupled with an EQ inspection, formed the basis of our recognition of the need for significant plant upgrade and improvement.

We began changes immediately at the site. As Cordell mentioned, there was a diagnostic evaluation in the 1987 timeframe that identified additional weaknesses and, in fact, brought the need for overall order to our improvement process.

One of the major findings of the diagnostic evaluation is although we had initiated numerous changes, they did not appear cohesive and coordinated, and that was the founding of our Dresden Station improvement plan in the 1987 timeframe.

[Slide.]

MR. EENIGENBURG: We were placed on a post-monitoring list in 1987 and removed in December of 1988. During this timeframe, we also developed and refined a corporate self-assessment program that we believe has helped to sustain our performance improvement. We have been to Washington for presentations on a number of occasions; September 1988 timeframe; we were there again this summer in 1990.

We've completed refueling outages on time on Dresden 3 on two occasions. There has been some slight delay in the return-to-service of Unit 2 this time. But of the three refueling outages that have been completed in the history of Dresden Station on time, two of them since the improvements efforts began.

In-service testing was one of the focuses of the Diagnostic Team and we have made some significant upgrades there. Emergency operating procedures have been upgraded to EPG Rev. 4. We had the NRC Maintenance Team inspections.

[Slide.]

MR. EENIGENBURG: I would just quickly show you the NRC Maintenance Team tree. Recognizing that you can't read it, the only significance are the colors on the tree, and this is our evaluation in the 1989 timeframe, showing the improvements that have been made in the maintenance area at that time.

The green boxes indicate good performance. The yellow is a needs improvement area. The red is rated poorly. You only see three reds, quite a few greens, and the boxes that are both green and yellow indicates that programmatically where we're going or what we intend to do looks good, but it's not fully implemented yet, and that's the lower half of the box.

We were particularly happy with this column, which was management commitment and example, and believe that's indicative of what we're doing overall.

MR. CARROLL: What's the all red box?

MR. EENIGENBURG: Electrical maintenance. In particular, it was maintenance of our four KV distribution system and we have had a number of programmatic corrective actions in that area.

[Slide.]

MR. EENIGENBURG: We, incidentally, did have a team followup a year ago that noted significant improvement in that electrical maintenance area. The other two half-red boxes were in the area of maintenance history and equipment trending. These were some of the programmatic things that were referred to in the area of maintenance weaknesses. It was not necessarily weaknesses on the part of the craftsman or had anything to do with the way they were trained. It was the programmatic methodology with which we were approaching overall maintenance of the facility.

MR. WILKINS: Is it possible to track any of your outages or difficulties of any sort to failures in the electrical maintenance area?

MR. EENIGENBURG: We have had difficulties where we have had outages or forced outages that were initiated by electrical equipment failures that could have been prevented by an improved maintenance program. In fact, I think as I show you some trends, you will see that the trends are headed in the right direction and that we believe our changes are effective.

During this time period, we've set record runs on both of the units. We were also recognized by General Electric for running 403 days without a reactor scram on either unit.

MR. SHEWMON: What is your average fuel cycle right now?

MR. EENIGENBURG: Eighteen months.

MR. SHEWMON: How long have you been on that cycle?

MR. EENIGENBURG: We've been on an 18-month cycle since late 1970s or early 1980s.

MR. SHEWMON: While I've stopped you with that or interrupted, have you gone this duplex cladding on all of your fuel now or whatever the word for it is?

MR. EENIGENBURG: We do not have the barrier fuel installed on either of the two Dresden units. The Dresden units use ANF fuel, although we have converted to the nine-by-nine fuel assembly array. We are looking to barrier clad for a subsequent core load.

MR. SHEWMON: You must want to do some load following with that plant with the amount of nuclear you have. Do you do much with that or can you?

MR. EENIGENBURG: Yes, we do and can, although our flexibility is not quite as great as our Quad Cities plant, which does use the GE barrier fuel design. That's one of the reasons for looking at barrier fuel in subsequent cycles at Dresden.

MR. CARROLL: When you talk of an 18-month cycle, what capacity factor do you assume are in the operating period given the amount of load following you're doing?

MR. EENIGENBURG: The capacity factor we have been running at is about 70 percent.

MR. CARROLL: During the cycle.

MR. EENIGENBURG: Yes, sir.

MR. CARROLL: Excluding the outage period.

MR. EENIGENBURG: Yes, sir. We also had the security effectiveness PER inspection in the 1989 timeframe. It was a very successful inspection and there's been a significant reduction in personnel error. I've got some statistics on that a little later, as well.

[Slide.]

MR. EENIGENBURG: In the area of facility upgrades, the training facility that was referred to is being complete. It's a new 70,000 square foot facility on-site. We've occupied it within the past month. We have a site-specific simulator that currently is at the GE facility that is in the process of being moved to the Dresden site facility, and will be operable next year.

We've remodeled chemistry labs. We've labelled the plant valves, components, electrical systems, and we've been in a complete plant physical upgrade that I'd like to quickly show you via some slides.

MR. SHEWMON: Before you get that up. The staff makes a point of commenting that you do not monitor, either by crack arrest or electrochemical potential methods, your hydrogen water treatment. How do you monitor this; just put in so much hydrogen or what?

MR. EENIGENBURG: Up till now, the flow rate of hydrogen has been the key determination and that flow rate was set with an EPRI-sponsored 1983 series of tests where electrochemical potential was monitored. We concluded that 41 SCFH of hydrogen or 41 SCFM hydrogen in the feed water would give us a 1.3 parts-per-million concentration. That has been the way we have monitored hydrogen addition to date.

During the course of the last cycle, we have installed the crack arrest verification system and the ECP probes and we will come out of this current refueling cycle with that system operable.

MR. SHEWMON: Have you had to restrain access to your turbine area because of this?

MR. EENIGENBURG: Yes, sir. It has basically left the plant, I guess, minimally effected. We do have turbine shield walls provided with the original design, and, as a result, the general access to the area is not impeded, but operating access to the high pressure heater bays, low pressure heater bays, or the turbine itself requires hydrogen addition to be secured to drop radiation does rates.

MR. SHEWMON: Do you expect or hope to be able to drop that hydrogen flow-back appreciably with your better monitoring?

MR. EENIGENBURG: I don't expect to. We only expect to have on-line indication that we have adequate hydrogen at all times. I wouldn't expect a significant reduction.

[Slide.]

MR. EENIGENBURG: In fact, down in the lower corner of this slide, you see the 70,000 square foot training facility that was just added to the site.

[Slide.]

MR. EENIGENBURG: This is the way the plant looked originally. I've got a number of before-and-after pictures just to give you an idea of the physical upgrades that have taken place at the plant.

[Slide.]

MR. EENIGENBURG: This is an electro-hydraulic control unit, before-and-after attention. You'll also see color barriers. The yellow barrier is Unit 2 components.

[Slide.]

MR. EENIGENBURG: The original construction of the plant. Very little, if anything was painted.

[Slide.]

MR. EENIGENBURG: The same area again after an upgrade.

[Slide.]

MR. EENIGENBURG: We found ladders, scaffolding, rolling equipment throughout the plant. Those areas have, again, been restored to this kind of condition that is now our standard.

[Slide.]

MR. MICHELSON: Just for clarification, I didn't sense any great amount of labelling after your paint job. Did you go back later and label all these things?

MR. EENIGENBURG: Yes. Labelling has been an ongoing problem. The initial emphasis was on valves. It is now on components and piping.

MR. CATTON: The difference in these pictures is dramatic. Was it really that bad before?

MR. EENIGENBURG: Yes, sir.

MR. REED: We didn't think that was bad until we saw --

MR. CATTON: But if you look at the two pictures.

MR. EENIGENBURG: In fact, I was at the plant for a nine-year period and I would have told you that this was pretty good. This was straightened up. I just think that this was our normal expectation.

MR. SHEWMON: Did you build a new warehouse? Where did you put everything?

[Slide.]

MR. EENIGENBURG: In fact, most of this stuff did not go to a warehouse. A lot of it is contractor equipment, a lot of it was just abandoned. It had just been neglected. People walked by it and it sat.

MR. CARROLL: It's not my mess is a very common power plant philosophy.

MR. EENIGENBURG: Yes, sir.

[Slide.]

MR. EENIGENBURG: Control rod accumulator banks and, again, you see the radiation rope and the plastic three feet out, required our operators to dress in protective clothing to get to the accumulator banks and, in fact, left a very narrow aisle.

[Slide.]

MR. EENIGENBURG: Again with some effort directed at keeping the area clean. We opened the whole area up. We found in the 1986 timeframe that our operators had to change clothes eight times to complete their operator rounds. Our expectation is an operator can now do his round in street clothes and we believe we're doing a much better job of monitoring our equipment.

[Slide.]

MR. EENIGENBURG: Emergency core cooling equipment in the early 1986 timeframe.

[Slide.]

MR. EENIGENBURG: Again, the same equipment after it's had some cleaning, decontamination and painting. This kind of overall facelift, although it appears somewhat cosmetic, I believe, certainly has its way of making it through the entire organization.

[Slide.]

MR. EENIGENBURG: Here's some of the labelling that has gone on and, in fact, now we are color coding the faces of breakers to the unit that they feed. Again, you see a standardized labelling that goes with the breaker facility.

MR. CARROLL: Cross-hatched cubicle was common to both units?

MR. EENIGENBURG: Yes, sir. In fact, a potential trap for an operator to stumble into.

[Slide.]

MR. EENIGENBURG: Just briefly in the area of facility upgrades, there was some discussion of the DCRDR project. It was quite extensive. We nave completely remodeled the control room.

MR. SHEWMON: What is DCRDR?

MR. EENIGENBURG: Detailed Control Room Design Review, and has been in a very extensive process with human factors layout of the control panels. The major work remaining is upgrade of the complete enunciator, splitting multiple enunciator inputs, adding the sequence of events recorder, but, as indicated, none of the remaining DCRDR upgrades are Category A items.

We've also been off paying attention to balance of plant. Our rad waste system has seen a significant upgrade. In fact, it is still in progress. We, as part of this overall cleanup, have been doing a lot of shipment of radioactive material as we've cleaned out the plant.

MR. SHEWMON: The piping replacement was talked about and was driven largely by IGSCC. What drove the pump replacement and what did you replace?

MR. EENIGENBURG: The pumps being replaced in the rad waste area, the floor drain collector pumps, waste collector pumps. It was primarily aging of the pumps and the service that they had seen. They had worn out. They were basically obsolete and difficult to obtain parts for.

MR. SIESS: You mean aging existed before the NRC thought of it?

MR. EENIGENBURG: Pardon me?

MR. SIESS: Aging existed before the NRC thought of it?

MR. EENIGENBURG: I think we invented it.

[Slide.]

MR. EENIGENBURG: There are quite a few programmatic items listed in the book that I can skip over, unless there's a particular interest in one of them. Byron had indicated our SALP history and this shows the evolution of SALP from SALP 7 through 9. Again, you see the prized SALP 1 in the operations area for which we are very proud, and the general trend from left to right showing the improvement.

MR. WILKINS: What does the vertical arrow mean?

MR. EENIGENBURG: An improvement trend.

MR. WILKINS: From three to two or from two-and-three-quarters to two-and-a-half?

MR. REED: No. Two and improving. If we kept that pace, we could be a one in the next SALP period.

MR. SIESS: The arrow ought to point down. One is smaller than two.

[Slide.]

MR. EENIGENBURG: We talked briefly about being rated as an INPO five in the 1986 timeframe. This shows our improvement efforts INPO recognized. This is a four in 1987, a three in 1988, a two in 1989, and we are due for our next evaluation in the summer of 1991.

MR. KERR: And by 1991, you'll be a zero.

[Laughter.]

MR. EENIGENBURG: I would be willing to stop at one.

[Slide.]

MR. EENIGENBURG: This is an indicator of scrams. It was recognized that one of the things that got us to the NRC monitoring list was the number of scrams at the plant. Again, you see the 1983 through 1987 timeframe, we had greater than or equal to ten scrams per unit. You can see as most of our indicators, Unit 2 is about equal to Unit 3. In fact, most of the indicators that I'll show you are pretty evenly split between the two units.

This shows the total of forced scrams in 1990. One of those was a manual scram. If you look at automatic scrams a little critical, which is one of the key indicators we watch, it has been 271 days.

[Slide.]

MR. EENIGENBURG: Forced outage rate was on the increase on the mid-1987 time period and, in fact, again, I believe that's one of the things that has helped us toward the watch list. There was essentially no forced outage in the 1988 timeframe and we're staying pretty close to the five percent in the 1990 timeframe.

MR. WILKINS: It is true, however, that between 1988 and 1990, you seem to have lost ground in both this slide and the previous one.

MR. EENIGENBURG: It has been recognized that 1988 and 1989 were probably reversed. We had too good of a year in 1988 and, as a result, anything less than that seems to suffer.

MR. REED: Four or five percent forced outage rate is probable the top quartile's performance in the industry. Our goal is to get below three percent.

[Slide.]

MR. EENIGENBURG: Licensee event reports have shown a significant decrease since the mid-1980 timeframe. We are currently still at less than 20 for this year total for the station and in 1985 through 1987, exceeded 50.

[Slide.]

MR. EENIGENBURG: I mentioned the significant reduction in personnel error. Again, you see the personnel error deviation reports decreasing from a total of almost 70 in 1985 to ten in 1990. Similarly, the blue line showed 30 personnel error licensee event reports in the 1985 timeframe. There has been one so far in 1990.

MR. WILKINS: Excuse me. There is something I don't understand. You said 70 DVRs in 1985?

MR. EENIGENBURG: Seventy personnel error.

MR. WILKINS: I would have read that as not quite 40. So maybe I'm obviously not reading it correctly.

MR. EENIGENBURG: 1985 looks like about 68.

MR. WILKINS: Does the green start where the blue leaves off?

MR. EENIGENBURG: No.

MR. WILKINS: Obviously not. All right.

MR. EENIGENBURG: They are all deviation reports. A subset of them are reportable to the NRC as licensee event reports.

MR. WILKINS: That's not the point. I would have drawn those two instead of in the same vertical line as parallel lines, and I would have started the green at zero and run it to 70.

MR. SIESS: No. The DVRs are all-inclusive. Some fraction of them are LERs.

MR. WARD: So the logical problem is in my understanding.

MR. SIESS: Yes.

MR. WILKINS: Thank you.

MR. SIESS: In this case.

MR. MICHELSON: How do you identify an LER as being a personnel error?

MR. EENIGENBURG: It is the root cause of the licensee event report that is personnel error.

MR. MICHELSON: Let me ask it differently. Are all of the LERs you're listing here those on which in the LER you specifically pointed out personnel error as the root cause?

MR. EENIGENBURG: Yes, sir. For instance, in 1990 so far, there have been 20 LERs, one of which has a root cause of personnel error.

MR. MICHELSON: Has that been the practice since 1985?

MR. EENIGENBURG: Yes, sir.

[Slide.]

MR. EENIGENBURG: Another indicator, the amount of dry active waste or contaminated garbage that goes to a burial site; again, 35,000 cubic feet in the 1985 timeframe, down so far this year to under 10,000.

MR. SIESS: Where do you put it?

MR. EENIGENBURG: We create less.

MR. SHEWMON: Where can you ship it?

MR. EENIGENBURG: We are currently still shipping to Barnwell, South Carolina. We can also ship to Beatty, Nevada or Richland, Washington, but this year I believe almost exclusively we've gone to Barnwell, South Carolina.

MR. WILKINS: Has Illinois been warned that it can't ship to South Carolina until it gets its act together?

MR. SIESS: Illinois has a pact.

MR. REED: If I can respond. I have an opportunity this afternoon to go and speak to the transition team for our new Governor and try to get them to understand that that's an issue. Illinois has made good progress. We stand some opportunity to beat January 1993. More than likely, we're headed toward October of 1993. So it's very important that the next Administration continue the progress that's been made thus far.

MR. SIESS: But they haven't found a site yet.

MR. REED: No. The Martinsville site, which all the geotechnical data has been performed on, will have to go through hearings, adjudicatory hearings that can maybe take place early next year and they're scheduled to do that. If we do not get that site, then we would have to possibly sustain a very long delay.

[Slide.]

MR. EENIGENBURG: Personnel error contaminations were a problem, as can be seen on this slide. The 1985-86 timeframe, we were up to almost 1,800 cases where an individual was contaminated in the course of work. You can see the significant decrease. We're at 259 year-to-date.

[Slide.]

MR. EENIGENBURG: Again, an improvement in work practices, plant cleanliness and plant decontamination has made that difference. Finally, probably our most telling overall indicator, and there's a lot of data on here, I'd just quickly point out that the blue line is single month equivalent availability for the station. You see only one month back in the 1982 timeframe where that exceeded 90 percent, whereas if you look from 1987 on, it's a relatively frequent occurrence.

Also, the green line is our 12 month rolling average equivalent availability and you can see from a performance level of between 60 and 70 percent in the early 1980s when we were termed a "average performer," we saw a general decline in equivalent availability through the 1984, 1985 and 1986 timeframe, till we reached a bottom of about 38 percent.

It has been on a very positive trend and now runs consistently between 70 and 80 percent. Finally, the red line is a five-year rolling average and, as a result, is a much slower to respond indicator, but, again, you see the general decline that has been turned around since about the mid-1987 timeframe.

Also interesting from this point in 1983, the 12-month average was running below the five-year average. Since 1987, the 12-month average has been leading the five-year average. As a result we expect continued increase in the five-year equivalent availability average for the station.

I think it speaks towards our overall improvement and performance, both of personnel programs and equipment.

MR. SIESS: Do you make any use of the Nuclear Regulatory Commission's performance indicator?

MR. EENIGENBURG: There are a number of performance indicators that we watch very closely. We do look very closely at the performance indicators published by AEOD, as well as the INPO performance indicators. We have created our own set of performance indicators.

MR. SIESS: Is the NRC now publishing those performance indicators? The last I heard, you had to get your lawyer to get them for you in the Public Document Room.

MR. REED: We get them. They are about five months behind the period of interest, but we get them and we don't need a lawyer to get them.

MR. ZWOLINSKI: Correct.

MR. REED: But we do get them. We do review those with our Chairman, the same way we review our own performance indicators.

MR. SIESS: But they're different than yours.

MR. REED: Yes. The scrams, I think they're used -- they are different.

MR. CARROLL: Do you find them useful?

MR. REED: All numbers are just somewhat limited at usefulness, as we've experienced at Zion. Zion had low scrams, they had high availability, and it wasn't until we conducted performance-based self-assessment in the plant that we started to see the same kinds of things that INPO would see.

That is deficiencies in people doing their job. So whenever we present reviews to our management and to our Board of Directors, we put most stake on our performance assessment, and normally the numbers will match, they'll show good and then your performance goes bad, and when the people start doing things right in the field, the numbers are slow to come back. So I think we have to use all of that.

MR. SIESS: Any further questions now?

MR. KERR: This is an operational question, but what is the status of your IPE program for Dresden?

MR. REED: Bill, I can't tell you when we're going to submit -- there's a meeting I'm going to have on Monday to look at all six of our plants. I can tell you, however, that we're more in the 1992 or 1993 timeframe for submittal of Dresden.

MR. KERR: I was thinking not so much of submittal as of your starting the process.

MR. REED: We have started the process on all six of our plants. We are very much engaged in all of our plants.

MR. KERR: Thank you.

MR. SIESS: Any other questions? Any more to hear from the staff? Has anybody thought up some questions for the staff?

[No response.]

MR. SIESS: Thank you, gentlemen. Nice to have you back.

MR. REED: Thank you.

MR. WILKINS: I did have one. Mr. Reed, before you go too far. You may recall at the beginning of this I asked why we were doing this, and one of the possible answers was because Commonwealth Edison had something to gain. Let me get back to that.

You've gotten along 18 years without an FTOL and you could probably operate another 18 years without it, also. What is driving Commonwealth Edison to pursue this matter at this time?

MR. REED: Frankly, we're a little uneasy with the status. The security analysts or other kinds of folks have not had concern over not having the full-term operating license. I don't think it is well known. But as we get into hearings on license renewal or life extension, it could become a major factor at that time.

So we have been eager to go ahead and cure this what we think is more of a technical deficiency in that license.

MR. WILKINS: That is responsive to my question. Thank you.

MR. LEWIS: That gets me a bit confused. How can you go into license extension if you're on a provisional license which doesn't have a termination date?

MR. SIESS: That's the question.

MR. REED: That is the same question some of our lawyers have put to us. That's why we don't want that to be an issue or to have public hearings and that's an issue. It's just uncertain about license renewal with this POL.

MR. LEWIS: I'm going in the other direction. I'm saying why do you even care about license renewal if you don't have a license to renew?

MR. REED: On second thought, maybe we withdraw.

[Laughter.]

MR. REED: I'm a little uneasy with that sort of logic.

MR. SIESS: You had to make your application for a full-term license. That was required by law.

MR. REED: We did. We did that back in 1972.

MR. SIESS: You did. There's nothing you can withdraw now.

MR. REED: Yes.

MR. SIESS: The staff could wait another ten years and still pick it up.

MR. REED: We sure would like to get a full-term operating license on Dresden.

MR. SIESS: We'll do our best. Gentlemen, if there's no more questions --

MR. KERR: Mr. Siess, I have to observe that in spite of the introductory remarks, I think this Committee has shown an extraordinary interest in what has gone on here this morning.

MR. SIESS: No more than I expected.

MR. WARD: It had nothing to do with the license application, per se. But operation of the plant has been very interesting.

MR. SIESS: No more than I expected, Bill, and that's why we scheduled three hours, which I was sure the Committee would manage to fill up and not very much likely to run over since we have a party coming up at noon.

Let's take a ten-minute break, gentlemen -- a real ten-minute break -- be back at 10:35.

[Brief recess.]

MR. SIESS: Gentlemen, be seated. We will now go ahead with the presentations by the staff and by the licensee for the Palisades plant. We're going to start off with whom?

MR. ZWOLINSKI: We will start with Armand Masciantonio, our Project Manager for Big Rock, and now has recently switched to Prairie Island. He did the majority of the work in constructing the actual safety evaluation report. Armand, are you ready?

MR. MASCIANTONIO: Yes, I am.

MR. SIESS: You all have copies of the safety evaluation report. It's blue. It says NUREG-1424. You may want to follow his discussion in there.

MR. MASCIANTONIO: Good morning. My name is Armand Masciantonio, as John said. I'm the Project Manager for Big Rock Point and for the last 12 months or so I have had the task of ushering the documents for the Palisades license conversion.

[Slide.]

MR. MASCIANTONIO: I'd like to start just giving you an outline of what we will present today. I'd like to mention also if you have questions, please interrupt at any time and between myself and the Project Manager for Palisades, Brian Holian, and the technical staff, we'll do the best to answer your questions.

Our presentation will summarize the information in the safety evaluation report which was previously provided to the ACRS. The topics I will be covering today are some background information on the license conversion, highlight some of the major events of the Palisades operating history, discuss the systematic evaluation program and its impact on the license conversion, and review the unimplemented unresolved safety issues applicable to Palisades.

Now, recognizing that there really are no safety issues specific to the license conversion, it wasn't our intent to go into a detailed technical discussion on these topics, but simply to provide an overview of the issues that are significant to the license conversion.

[Slide.]

MR. MASCIANTONIO: I'd like to begin with a little bit about the plant description. Palisades is a Combustion Engineering Bechtel pressurized water reactor. It's licensed at a power level of 2,530 megawatts, has two hot legs with two steam generators, and four cold legs with four coolant circulation pumps.

The secondary side consists basically of the turbine generator, the condenser and the feed water system. Reactor containment is a concrete cylinder on a concrete slab, with a quarter-inch steel liner on the inside containment walls. It uses mechanical draft cooling towers and the plant is located on the eastern shore of Lake Michigan, near South Haven.

The closest population center are the twin cities of Benton Harbor and St. Joseph, located about 16 miles to the south.

MR. SIESS: Let me add something that the Committee might find of interest. Palisades was the first Combustion Engineering, large Combustion Engineering plant. At the time it was licensed, it was the largest plant operating in the U.S and it was one of the very early prestressed concrete containments.

I know Ginna was the first one and I think this followed not too long afterwards. So it was really one of the early ones in the process. It's the eighth plant to replace steam generators.

[Slide.]

MR. MASCIANTONIO: Much of the background on the early provisional license issuance was discussed by Byron Siegel earlier, so I won't repeat a lot of that information, except to say that Palisades was issued a license in March of 1971 and was due to expire in March of 1974.

On January 22, 1974, they did come in for an application for a license conversion, and, according to the provisions of 10 CFR 2.109, was allowed to continue to operate the plant beyond the license expiration date, pending the disposition of that application.

The only other item I want to point out is that Palisades was reviewed under the SEP program and the results and the technical evaluations performed under the systematic evaluation program are documented in the Integrated Plant Safety Assessment Report. That report and Supplement 1, which was issued in 1983, form the support for the issuance of the full-term license.

[Slide.]

MR. MASCIANTONIO: I would just like to highlight a little bit of the operating history. Along with the application for the full-term license in January 1974, Consumers Power requested a power increase from the licensed 2,200 megawatts to 2,638 megawatts. That power increase was denied at the time because of steam generator problems.

Also in 1974, as a result of an agreement that was reached with intervenors during the licensing hearings, in March of 1974 the plant was modified to allow operation with a closed cooling cycle using cooling towers, mechanical cooling towers as opposed to the once-through cooling that was used up until that time using Lake Michigan water.

MR. SHEWMON: What was the nature of the problem with the steam generator in 1974?

MR. MASCIANTONIO: There were quite a few problems related to wastage, corrosion type problems, and we'll have a lot more to say about this a little bit later. Brian will address the steam generator replacement in detail and go into that issue.

MR. SIESS: I'm sorry. I don't think we want that addressed in detail.

MR. MASCIANTONIO: Okay. We will provide the information you need on the early problems with the steam generators.

In November of 1977, Palisades was granted a power increase to 2,530 megawatts, based on improvements to the steam generators. Another major event was the approval in July of 1987 to increase the amount of spent fuel storage in the fuel pool by about 200 fuel assemblies to its present capacity of 892 fuel assemblies.

This capacity right now is sufficient to allow a full core discharge capability until 1992. For future storage, the licensee has indicated that it will apply for a general license under the new Subpart K for the off-site storage of spent fuel in dry casks.

The steam generators have had a long history of tube leaks, which led the licensee to replace both steam generators during the current outage. As I mentioned, we'll have a little bit more to say on this later on.

[Slide.]

MR. MASCIANTONIO: As far as the systematic evaluation program, the Commission initiated this SEP program to provide a framework for reviewing the designs of older operating nuclear plants, to reconfirm and document their safety. The review provided, first of all, an assessment of the significance of the differences between the current technical positions on safety issues and those that existed when the plant was licensed.

Secondly, it provided a basis for making decisions on how these differences should be resolved in an integrated plant review. The review compared the as-built plant design with the then-current review criteria in 137 different topic areas. During the SEP review, a number of these topics were deleted from consideration because they were being covered under other programs or they simply weren't applicable to Palisades.

So of the original 137 topics, 90 were reviewed, and, of these, 59 met the current criteria or were acceptable on some other basis. So the review concentrated on the 31 remaining topics and found that some aspects of the plant design differed from the current criteria.

As I mentioned before, the evaluation of these topics and their status was addressed in the report NUREG-0820, and many of the issues were closed out in Supplement 1, which was issued in November 1983. So of the 90 topics that were reviewed, all but three of the topics were closed with Supplement 1. I'd just like to say a few words about those remaining three as of 1983.

[Slide.]

MR. MASCIANTONIO: These were the three topics that were open at that time. The first one is Topic III-5A, the effects of pipe breaks on site containment; seismic design issues, Topic III-6, similar to Dresden; and Topic III-7B, design codes of standards.

MR. SHEWMON: Was pipe break resolved by a leak-before-break argument?

MR. MASCIANTONIO: The resolution was provided by a staff SER in 1987. I'm not familiar too much with the details. I haven't read the SER, but it was resolved using the SEP guidelines that demonstrated that breaks in the lines in the vicinity of the instruments need not be postulated.

MR. SHEWMON: You've got another item here about asymmetric blowdown modes and the usual way to cope with that is leak-before-break. I would like an answer to the question as to whether they've applied that to the primary system and how much of the primary system. Is there anybody here that can tell me?

MR. SIESS: An acceptable answer will be I don't know.

MR. MASCIANTONIO: I don't know that answer, but I will find out for you.

MR. SHEWMON: Thank you.

MR. MICHELSON: I would like to find out, also, what the answer is.

MR. SHEWMON: I'm not surprised. Go ahead.

MR. VANDEWALLE: This is Dave Vandewalle, Consumers Power Company. The basis for the resolution of that issue under SEP was leak-before-break for the primary system, and there was a detailed study performed of potential targets of systems in the containment building in the event of a break, and then those targets were individually dispositioned based upon leak-before-break evaluation and fracture mechanics analysis of the primary system.

MR. MICHELSON: At what point in time was that analysis done?

MR. SHEWMON: The SER?

MR. MICHELSON: No. The leak-before-break analysis. Which standard review plan did you use to make that determination? You know that was revised in about 1988-89 significantly.

MR. SHEWMON: It was closed in 1987.

MR. MICHELSON: What I was really asking is did your analysis meet the requirements of the revised standard review plan. It was afterwards, admittedly, but people were already thinking about it.

MR. VANDEWALLE: I guess I can't answer that. As Mr. Masciantonio said, it was done in accordance with the systematic evaluation program criteria that had been developed. I don't know if those criteria were the basis for the revisions to the reg guide.

MR. MICHELSON: Correct me if I'm wrong, but I thought all this leak-before-break wasn't really thought through and put into the standard review plan until 1988?

MR. SIESS: There may be a difference, Carl, between the systematic evaluation program items and other items that came up later. I'm not sure.

MR. MICHELSON: There are quite a few rather explicit requirements to claim leak-before-break.

MR. SIESS: I'm not sure they were at the time the SEP was done. These are the SEP items.

MR. MICHELSON: Okay. There was a different set of acceptable criteria, then, for determining --

MR. SIESS: If you'd like to explore that, I can arrange a Subcommittee meeting.

MR. MICHELSON: No, no.

MR. SIESS: It might be interesting.

MR. MICHELSON: These old ones are always interesting.

MR. MASCIANTONIO: In any case, we'll get a copy of that SER and answer your questions and we'll provide the answers. The other topic that was left open at the time of the SEP supplement was seismic design issues. This topic relates to the adequacy of the design of certain structures to withstand seismic motions. At the time of that SEP supplement, there were six issues open under this topic.

Four of those issues have been subsequently resolved by a staff SER in August of this year. The remaining two are still under review. SEP Topic III-7B, design codes and standards, deals with the extent of Palisades' conformance to revised design codes and standards

The only issue not resolved is the extreme snow loading on the roof of the spent fuel building. These two remaining topics are being reviewed by the staff and will be resolved through normal licensing action.

[Slide.]

MR. MASCIANTONIO: The other item that I would like to talk about this morning are the unresolved safety issues. The status of the unresolved safety issues was addressed in the staff review of responses to a generic letter issued in 1989, Generic Letter 89-21. The results of that re iew were presented to the Commission in February of 1990.

There were 12 unresolved safety issues that are applicable to Palisades, and of those 12, six have not yet been fully implemented.

[Slide.]

MR. MASCIANTONIO: Those six issues are as shown here. I'd like to just go through each one and give you a status. USI A-9, the ATWS rule, the staff issued an SER on Palisades conformance in December of 1989. That SER accepted the Palisades ATWS design. The modifications implementing the design are currently in progress and should be finished by the end of the current outage.

USI A-11, reactor vessel and material toughness, the status of this unresolved safety issue is that Consumers has joined the CE Owners' Group to determine the effects of low upper shelf energy values. The staff will be working with the licensee, the Owners' Group, the ASME Code Subgroup to resolve the issue of the low CHARPY values.

Consumers is also pursuing an alternate approach using accelerated irradiated specimens from other plate materials, along with justification as to the chemical similarity to the limiting latent material.

MR. SHEWMON: This is plate, not welds. The plate is limiting?

MR. MASCIANTONIO: Barry, would you answer that?

MR. ELLIOTT. The upper shelf energy area -- plates.

MR. MASCIANTONIO: Barry Elliott. USI A-44 is station blackouts. Palisades has chosen to respond to this rule by improving the reliability of the alternate AC source. The final modifications in response to the rule have been completed and the staff is reviewing the Consumers Power response, which was submitted in April of 1989, and we'll issue an SER subsequently.

USI A-46, seismic qualification of equipment. This issue is generic to a number of older plants, Dresden included. The issue is being resolved through the Seismic Qualification Utility Group and the Consumers is a member of that group and we'll follow the recommendations of that utility group when the recommendations are approved.

USI A-47 was resolved by Generic Letter 89-19. Consumers Power responded as part of a CE Owners' Group on March of 1990 and concluded that the recommendations in that generic letter should not be implemented at Palisades at this time, but will be addressed under the IPE program. That response is inhouse and it's under staff review at this time.

MR. MICHELSON: Would you like to tell me what that response was? I have some understanding of it, but what is your understanding of that response?

MR. MASCIANTONIO: I'd like to call on Brian Holian, the PM, to get a respon[illegible] [illegible]at. Brian, could you give us some details?

MR. HOLIAN: The question, again, was the response on which issue?

MR. MICHELSON: A-47, the Owners' Group response.

MR. MASCIANTONIO: Where the Consumers decided to respond as part of the Owners' Group.

MR. HOLIAN: The Owners' Group issue is ongoing now. They just had a meeting last month. The Palisades response has been that they do not believe it is a safety issue. They're looking at the response of the fact that they think the increased chance of a feed isolation at power takes away any of the other safety significance that can be gained by putting that in.

MR. MICHELSON: This problem has to do with steam generator overfill.

MR. HOLIAN: Correct.

MR. MICHELSON: So unless it's some other problem you've got here, and it has to do with the nature and quality of the instrumentation and control system that assures that you don't get a steam generator overfill. Could you tell me just very briefly what the present status of Palisades is?

MR. HOLIAN: The present status of Palisades is that they are in line with the CE Owners' Group position. The CE Owners' Group position --

MR. MICHELSON: What do they have there now? The CE Owners are taking a position that they don't need to change it. What is there now?

MR. HOLIAN: Right. They ramped down their feed water flow and --

MR. MICHELSON: Well, single-train instrument, multi-train non-safety, multi-train safety.

MR. SIESS: It would probably be better to ask these questions of the applicant or the licensee. He's right here.

MR. MICHELSON: I just don't know what they have.

MR. VANDEWALLE: We presently isolate feed water on high level steam generators. We use instrumentation that's separate from our feed water control system. It's a single instrument for each steam generator.

MR. MICHELSON: So it's a single train --

MR. VANDEWALLE: And it's not safety-related in terms of its quality.

MR. MICHELSON: It's single train, non-safety overfill protection.

MR. VANDEWALLE: But it is independent in terms of it's not the same level instrumentation transmitter that's used for our feed water control system.

MR. MICHELSON: Now, on your feed water control, on that system, if you're getting high level, does that system trip the feed water, as well, or does it just ramp it back?

MR. VANDEWALLE: The feed water control system will ramp the feed water pumps and reduce the feed water flow on a reactor trip, yes.

MR. MICHELSON: Just to some minimum.

MR. VANDEWALLE: To some minimal value.

MR. MICHELSON: And if it keeps filling, then this other device is it.

MR. VANDEWALLE: That's correct.

MR. MICHELSCN: And it's single train, non-safety.

MR. VANDEWALLE: That's correct.

MR. CARROLL: Given that, what's the argument that says that isolating the feed water may impose additional risks if you don't do this?

MR. VANDEWALLE: That is part of the argument. More of the argument is that we don't believe, the Owners' Group does not believe that the modification improves safety to the degree that the NRC concluded in their cost benefit analysis, nor that the cost of the modification is as low as the NRC concluded in their cost benefit analysis.

We believe the modification is marginal in terms of its safety benefit.

MR. MICHELSON: But you will have to admit that a single train, non-safety is about as skinny as any vendor provides. Some of them provide three-train non-safety even to make sure this doesn't happen, but, in your case, going down a single train, I'd be very interested in seeing that cost benefit. You've got to do it on some kind of probablistic basis.

MR. SIESS: Has that cost benefit been submitted by the Owners' Group?

MR. VANDEWALLE: There has been a presentation to the staff and Mr. Thadani regarding that.

MR. SIESS: But there is no document that you could provide to Mr. Michelson?

MR. VANDEWALLE: There is a set of presentation slides that could be provided to Mr. Michelson.

MR. MICHELSON: It is an open item, though, if I understand correctly.

MR. SIESS: That's why we're talking about it. It's open.

MR. CARROLL: San Onofre has agreed to do it.

MR. VANDEWALLE: That's my understanding. San Onofre has.

MR. SIESS: San Onofre broke the coalition.

MR. MICHELSON: But the staff has not reached a conclusion yet. So when they do, could you --

MR. MASCIANTONIO: It is open and the current status is as I mentioned.

MR. MICHELSON: Could you let us know, send us a copy of the conclusions?

MR. SIESS: It isn't clear everything that he is addressing here is open. Only the items that are open are being discussed.

MR. MICHELSON: My only interest was finding out what the present arrangement is since I didn't --

MR. MARSH: Mr. Chairman, this is Tad Marsh. Would you like a copy of the slides that were presented to Ashok Thadani?

MR. MICHELSON: No. I think I'd just like to see the final resolution. You'll probably send that to ACRS anyway.

MR. MARSH: Yes.

MR. MICHELSON: Because it's not just this one plant.

MR. CARROLL: I guess I had a misconception. I didn't think you had this protection. You really have the protection. The argument is for A-46.

MR. VANDEWALLE: The question that was asked is is the problem that we do not have any protection or that we do not have protection that meets the NRC's requirements regarding redundancy and safety grade nature of the trip. The answer is that we don't -- the problem is that we don't meet the redundancy and safety grade requirements of the trip rather than we don't have any trip at all.

Our belief is that upgrading that would not improve safety as greatly as the cost of that modification.

MR. MICHELSON: Have you done some kind of a failure modes and effect analysis to assure you that on a loss of a particular voltage that you don't both go to full-full on the feed water and lose the voltage to the overfill protection device? Have you done those kind of simplistic examinations?

MR. VANDEWALLE: I do not believe that a failure modes and effects analysis has been performed at this point. We are proposing to the staff to address this issue as part of the individual plant evaluation and, therefore, a single failure analysis would be part of that evaluation.

MR. SIESS: Go ahead.

MR. MASCIANTONIO: Thank you. The last item under the USIs is the pressurized thermal shock. The Committee did express an interest in discussing this in more detail.

MR. SIESS: I'm sorry. That's not correct.

MR. MASCIANTONIO: I misunderstood.

MR. SIESS: You were told that we would only discuss it in more detail if a member wanted it. We heard the details yesterday.

MR. MASCIANTONIO: Th nk you. I stand corrected?

MR. SIESS: Paul, do you want to hear PTS?

MR. SHEWMON: I'd like to ask a few questions.

MR. SIESS: Now, do you want to ask them -- you're not going to get answers from this gentlemen.

MR. MASCIANTONIO: We have Barry Elliott, but I can give you the status right now, if you'd like, and then Barry can answer.

MR. SHEWMON: This is the last item on his agenda. I assume we can call up anybody else on the staff.

MR. SIESS: He's standing at a microphone waiting to answer your question. The question is do you want a presentation or would you like to ask questions.

MR. SHEWMON: I'd like to ask questions.

MR. SIESS: So skip the presentation. When we get through with this, Paul will ask questions.

MR. MASCIANTONIO: The only thing I'd like to say is that Consumers did submit information on its fluence reduction efforts to comply with the PTS rule. Consumers is following the procedures in the rule to assure adequate vessel lifetime to allow operation to the end of plant life.

Right now the fluence reduction achieved to date is insufficient to allow plant operation to the end of the nominal license term. However, some measures being considered are greater flux reductions, analysis for Reg Guide 1.154, and vessel shielding.

This item is under staff review and NRC approval is required for any operation beyond the PTS screening criteria. As we mentioned, Barry is available to answer any detailed questions on this.

MR. SHEWMON: Would you explain to me the difference between vessel shielding and flux reduction?

MR. SIESS: Vessel shielding was adding thickness of steel plate on the --

MR. SHEWMON: It has nothing to do with materials. It has to do with the what the mechanical engineers stick in there.

MR. SIESS: I can answer the question or you can let Barry answer it.

MR. SHEWMON: Anybody that wants to.

MR. ELLIOTT: Barry Elliott. Flux reduction we think of as what we -- when you change the core design or put something into the core to reduce the neutron flux to the vessel. Vessel shielding is when we put something -- in this case, we're talking about the core barrel and putting pads on the core barrel to reduce the flux to the vessel.

MR. SHEWMON: Pads.

MR. ELLIOTT: Pads.

MR. SHEWMON: Steel plates. So myopia that you put in the fuel elements are flux reduction and what you put on the core barrel is shielding.

MR. SIESS: One is reducing the source and the other is reducing the target.

MR. SHEWMON: They're both absorbers.

MR. SIESS: Go ahead.

MR. MASCIANTONIO: Just in conclusion, then, based on our review and the small number of open items and their status, the staff recommends that the full-term license be issued. The issues that are still open will be resolved through normal licensing action. We feel that the issuance of a license will not have any impact on the open issues. Granting the license will not delay the resolution of these issues and, likewise, if the license is denied, it won't accelerate the resolution.

So we recommend that the license be granted.

MR. SIESS: I certainly can buy the latter because it looks like to me the biggest problem with the resolution is getting the staff to respond to the licensee's submittal. It's been nine months since they said they wanted to address the steam generator overfill under the IPE and the staff hasn't decided yet whether to tell them yes or no, apparently.

MR. CATTON: When are they going to come up again for the scree:.ing criteria for PTS?

MR. MASCIANTONIO: I believe the year is 2001.

MR. SIESS: Would you wait on that? We'll have one man that knows the answers address the issue. Any other questions?

MR. WILKINS: Yes. Let me ask this gentleman, if I may, on one of your slides, you indicated that 90 of these items or topics were reviewed for Palisades and that 59 met the current criteria. That's current as of 1981 or 1982?

MR. MASCIANTONIO: When the SEP program was --

MR. WILKINS: The NUREG was issued in 1982.

MR. MASCIANTONIO: That is correct.

MR. WILKINS: How many of them would meet the current criteria of 1990?

MR. MASCIANTONIO: I can't answer that.

MR. WILKINS: Is that of any consequence?

MR. MARSH: This is Tad Marsh. Let me respond to that. I don't believe it is. I don't believe many standard review plan sections have been changed since that timeframe and the SRP sections were used as the template for the reviews.

MR. SIESS: Let me add to that. Ernest, the original idea was that the SEP would be a continuing process and eventually all of the plants would get looked at on some sort of a cycle. It turned out that doing ten of them was more than anybody could stand.

So when they got through with that, they came up with a proposal to take the list of 137 t ɿt we and the staff had pared down from 500, I think, originally, and on the basis of what they'd found in looking at the first nine or ten plants, which were the issues most likely not to be met and which ones were most likely to have some safety significance.

I think they came up with, what, about 40 issues? John, do you remember?

MR. ZWOLINSKI: It's on that order of 40, yes.

MR. SIESS: Then they proposed to include those in an integrated safety assessment program called ISAP, which is another long stor, . That was to be a voluntary thing because of the way it was set up to be integrated and based on risk and not just on compliance with the regulations.

ISAP has flown only as far as the northeast utilities for their plants, but on the basis of that, I thin' the answer you got that if we kept on doing this, we'd reach a point of diminishing returns of backfitting, and especially since you probably couldn't justify most of the backfits on a cost benefit basis.

Any other questions for him?

MR. LEWIS: This isn't really a question, but I can say something about a subject that came up earlier at the appropriate time. Is this the appropriate time?

MR. SIESS: I don't know. What's the subject?

MR. LEWIS: The subject is what is safety. I've done some research and I can clarify that point, since he said they're recommending the FTOL. So that's on the basis of it. Let me just do it. It will take two minutes, or one minute.

The question came up earlier that the criteria being used for issuing the FTOL were that the plant would not endanger the public health and safety and would not do anything inimical to the common defense of security in the public health and safety, and those words come directly from the rule, from 10 CFR 50

MR. SIESS: I still believe you're wrong. It said that the plant would not endanger the health and safety of the public under one item. The other item did not say the plant would not be inimical. It said that issuing the FTOL would not be inimical.

MR. LEWIS: I'm quoting the rule, not the recommendation. The rule says the plant.

MR. MICHELSON: Why don't you just go ahead and complete your argument.

MR. LEWIS: Let me just clarify the point. The rule contains, both for new licenses and for conversions, those two words "will not endanger the public health and safety" and "will not be inimical to either the common defense of security or the public health and safety."

The law, the Atomic Energy Act says much more sensible things. It says that the licensee will protect the public health and safety and will minimize the risk to the public, which is sensible.

So the rule is in conflict with the law. My consultant at OGC, and I blush to admit that that's who I consulted, said to me that this was all clarified at the time that the backfit rule came up and it was generally agreed by the Court and them that all of these things added up to requirement for adequate protection of the public health and safety, but, of course, that hasn't been defined by anybody.

The words that ACRS uses, which are "no undue risk to the public health and safety," appeared by magic in 1960 in an OL letter, and I've yet to track that down. My parting shot from my consultant in OGC, whom I won't name, he said to me, he said, you know, 30 years ago, these would have been hot issues, goodbye.

So I hope that makes everybody as clear on this subject as I now am.

MR. SIESS: I don't think it makes any difference, but the regulations of the NRC state how -- the regulations say that the issuance of a license will not be inimical to the common defense of security or to the health and safety of the public.

MR. LEWIS: That's what it says there, but --

MR. SIESS: I am reading 10 CFR Part 50.

MR. WARD: But up here it says activities authorized by the --

MR. SIESS: That's right. They're two separate things.

MR. WARD: But issuing a license has an implication on public health and safety only in that it permits operation of the plant.

MR. MICHELSON: One at a time, microphones.

MR. LEWIS: I was quoting 50.40, which describes the requirements for issuing an original license, which has exactly the same wording, but ir a more general way.

MR. SIESS: You can read it the way you want. I'll read it the way I want.

MR. LEWIS: I was reading a different thing, Chet.

MR. SIESS: But you said it was exactly the same.

MR. MICHELSON: I think we better proceed.

MR. SIESS: Any other questions, comments?

[No response.]

MR. SIESS: Thank you. I was going to let the staff finish their general presentation on the issues, and then ask questions at that point.

MR. HOLIAN: We were prepared to have Mr. Elliott back up for questions. He'll do that. We had him scheduled right before myself. I'll go for about five minutes. The licensee will then make a short presentation, and then Mr. Elliott will be available for questions on pressurized thermal shock.

[Slide.]

MR. HOLIAN: My name is Brian Holian and I'm the Palisades Project Manager, and I plan on covering two unique plant-specific activities that are mentioned in Section 2.3 of the SER. Those are the steam generator replacement project that's ongoing now and the Palisades generating company.

I will then spend a couple of minutes addressing the Palisades operational history, concentrating on the last five to six years. Palisades was the first large-scale CE plant and when they were built they used coordinated phosphate control. In 1974, approximately two to three years after they started up, they had, at that time, already plugged over 2,600 steam generator tubes in that short period.

They shut down for a lengthy outage in 1974 and changed chemistry control to all volatile chemistry control.

MR. CARROLL: What percentage was that?

MR. HOLIAN: It was approximately five percent and up till now, right now, in 1990 when they shut down, they were at 25 percent. So through the 1970s and 1980s they had additional tubes plugged approximately eight different times, up to about 25 percent total.

As I mentioned, mid-1970s and early 1980s was a history of short production runs by the utility, mainly due to steam generator tube leakage problems.

[Slide.]

MR. HOLIAN: In the late 1970s, an agreement was made with Combustion Engineering where they would provide two new steam generators, and they were constructed in the late 1970s and stored down in Chattanooga. They were shipped to the site later on. It was up to the utility to see how long they could last with the present steam generators.

In 1989, the utility had another outage where they plugged another 200 tubes and, coming out of that outage, they agreed to operate at 80 percent for that next cycle with a lower tech spec limit on steam generator leakage and, at that time, they decided to replace the steam generators starting in September of this year, 1990.

The steam generator replacement project started in September. As was mentioned earlier by a panel member, there have been eight steam generator replacements to date so far. Palisades is unique in two aspects of that. That is that the steam generator replacement has a containment opening cut through three-and-a-half feet of the concrete, a containment opening that has been done overseas, but it was the first time it was done in the United States. Also, they used a process called narrow gap welding, basic gas constant arc welding, automated, but a single pass one on top of the other with less heat input. So those two aspects are unique to the Palisades steam generator replacement.

The status as of today is that the hole has been cut, the steam generators have been removed and stored on-site, similar to the way other utilities have stored them, in a concrete building. The new steam generators have been put in place. All the piping connections have been made and the liner plate has been rowelded in place.

This week they hope to commence the concrete pour to reclose the hole in the concrete containment wall.

MR. MICHELSON: What's the meaning of under 50.59 analysis in this case?

[Slide.]

MR. HOLIAN: I have a backup slide to cover that.

MR. MICHELSON: A few words, I think, will probably do it.

MR. HOLIAN: Just the fact that Palisades is the second plant to replace the steam generators under 10 CFR 50.59, which means that these first set of plants replaced their steam generators by coming into the Commission with a package and getting prior Commission approval.

MR. MICHELSON: I see.

MR. HOLIAN: Indian Point was the first one to do it under 10 CFR 50.59. That gives the history of the plant. Mr. Vandewalle is going to talk a little bit later about man rem and improvements that have been made in that.

MR. MICHELSON: On this point of 50.59, what you're saying is this is the first time you've allowed the utility to go ahead and decide what changes to make and so forth, document them as 50.59, to determine if there are unreviewed safety questions, and then proceed without --

MR. HOLIAN: That's correct, but it's the second time. Indian Point did it a year-and-a-half ago.

MR. MICHELSON: I'm sorry. It was the second time.

MR. HOLIAN: Right.

MR. MICHELSON: Thank you.

MR. CARROLL: In terms of the primary piping that you were talking about here, this is the carbon steel clad piping?

MR. HOLIAN: Carbon steel clad piping, correct.

MR. CARROLL: Okay.

MR. HOLIAN: The piping modifications here, mainly it's just the cut method, narrow gap weld. That piping modification refers to the main steam. They had to put in a riser on the top and life the main steam piping due to a main steam flow restrictor on the new steam generators.

The new steam generators are basically identical to the old steam generators. They have improvements, the main one being the egg crate design instead of the drilled support plates, which is where a lot of their problems in the tube leakage occurred.

MR. SHEWMON: Didn't they have the drill plate in their originally?

MR. HOLIAN: Originally, yes.

MR. SHEWMON: Now, the narrow gap weld you're talking about is on the top of the steam generator shell or on the piping or both?

MR. HOLIAN: That's only on the primary coolant system piping, hot and cold legs. Automated process -- the steam generator replacement project is approximately a $100 million project that Bechtel has undertaken on behalf of Consumers Power and that process, Bechtel is using people from Kraftwerk Union and Siemens who have done it overseas that have come to the United States to do that.

[Slide.]

MR. HOLIAN: I have some pictures on the steam generator replacement project, if you would like to look at any of them. You're free to look through them up here.

It's an interesting project for the site and Mr. Vandewalle will cover it a little bit more on the man rem.

The second issue is the transfer of the plant ownership.

MR. CARROLL: Why don't just pass your pictures around?

MR. HOLIAN: Okay. It mainly shows the construction opening and the steam generator is coming out through that opening. The second unique issue for Consumers Power Company is that in February of 1989, they put a license amendment in to approve a change in ownership of the plant from Consumers Power Company to a joint ownership between Consumers, Bechtel, and Westinghouse Corporation. Westinghouse was just named this year.

Right now the status of that is that they are undergoing Michigan Public Service Commission hearings that are ongoing now, they need that approval. December 17, the Federal Energy Regulatory Commission hearings commence. The staff is doing a financial review and an antitru review of their application.

An important aspect of this license amendment is that Consumers Power Company will maintain the operational aspects of the plant and they would need to come back in to the Commission if they wanted to change the operator of the pla , a change in ownership.

MR. SHEWMON: Consumers is still the operator of the plant. This gets them out from under the state PUCO or what happens?

MR. HOLIAN: That's correct. The interest behind it was when the Midland plant was cancelled, two things pushed this. One is getting out from underneath of Michigan Public Service Commission basically and getting under FERC control. The second issue is that it was an agreement between Consumers and Bechtel as part of a cash settlement from the Midland fiasco, for another word, when that plant was down.

MR. SIESS: Who was giving whom what?

MR. HOLIAN: The details, I believe it was $500 million. Is that correct?

MR. SIESS: Consumers gives Bechtel 33 percent of the plant --

MR. HOLIAN: For $500 million.

MR. SIESS: That was compensation to Consumers for Bechtel lousing up Midland?

MR. KESSLER: Bill Kessler. I'm with Consumers Power Company. The question was how was --

MR. HOLIAN: The cash settlement, what was given what.

MR. KESSLER: $100 million was the cash settlement to represent the liability that Bechtel had for the workmanship and that sort of thing on the Midland plant. That was a part of the deal.

MR. SIESS: That's Bechtel giving Midland something -- I mean, Consumers.

MR. KESSLER: That's correct.

MR. SIESS: Now Consumers Power gives Bechtel 33 percent of Palisades. What is that, punishment?

MR. KESSLER: No. There is a company that has been formed, Palisades Generating Company, and it's been formed by equity participation by the three companies, and Bechtel has the equity participation, its capitalization is $90 million for Palisades Generating Company.

Thirty-three percent of that $90 million has been provided by Bechtel to be a part of that corporation.

MR. SIESS: Okay. Thank you.

MR. HOLIAN: Thank you, Bill. Next, getting into the operational summary of the Palisades plant. Operationally, Palisades is historically considered an average plant. They have shown marked improvements in a couple areas in the last two to three years that I'll cover. From 1972 to 1990, they have had a capacity factor, an average capacity factor of 47 percent.

In 1986, they were starting up after a lengthy refueling outage and a lengthy run that they had in 1985 and they had a reactor trip and several complications, the feed system atmospheric dump valve sticking open. The plant took a look at them and their maintenance practices and put them on the plant senior management watch list, and that occurred in October of 1986, and they were removed from that in November of 1987.

[Slide.]

MR. HOLIAN: This slide shows the LER history. Once again, LERs submitted versus years. You just see LERs increasing. During this timeframe is when they ran into some problems in their maintenance areas and that's the main attribute on why those increased.

Recently they've shown a downward trend in LERs and are right around industry average with around 20 in 1990.

MR. KERR: Do you consider that there is a significant correlation between LERs and risk?

MR. HOLIAN: I believe -- significant correlation between LERs and risk, risk to the public?

MR. KERR: Yes.

MR. HOLIAN: I think LERs, myself, are just indicators. I think each individual event, once significant LER could show a lot more. So total number of LERs, no, I don't believe that it's significant. I think it's just another indicator.

MR. CARROLL: Do you believe that the industry average of 20 is the influence perhaps by a factor of three, depending on how you interpret the guidance on --

MR. HOLIAN: I believe that very much so.

MR. WARD: A leading question.

MR. HOLIAN: Back in that timeframe, 1987-88, there was also a reformulation of reporting criteria, and that's why some of those dropped off.

[Slide.]

MR. HOLIAN: The final slide I have is a slide showing the Palisades SALP ratings for 1984 on. Once again, this is engineering tech support and safety assessment quality verification. The important aspect is that in the 1984-85 timeframe, a lot of short runs by the utility, their 90-day run coming into this outage that was shut down in September was their seventh longest run in history.

A lot of two's basically. It's significant to know that the maintenance category in 1985 and 1987, here the SALP score in 1985 was a precursor and an indicator of problems they had in that 1986 timeframe, where they were forced to look and form a materials condition task force that Mr. Vandewalle will talk about in a couple minutes.

Since that timeframe, they've returned at least to average status in 1988 and have shown marked improvement in 1988 and in 1989 in operations and maintenance. I'd like to note that there will be a SALP Board for the 1990 timeframe in January of 1991, the next SALP Board will convene, and I just wanted to state that their history through this last cycle won't show drastic changes from those numbers.

MR. SHEWMON: What is the "N" in the last two columns?

MR. HOLIAN: These categories were not graded at that time.

MR. SHEWMON: Does that mean the NRC introduced them after 1987?

MR. HOLIAN: That's correct. This isn't all of the categories, either. These are the main categories I put on this slide. There were other categories that broke these down into individual units. But I've put them in this slide just to have looking backwards.

That's all I had to cover on the operational history and on the two major issues. Are there any other questions?

[No response.]

MR. HOLIAN: With that, I will introduce Mr. Vandewalle.

MR. SIESS: Let's stop at this point while the staff is still operating. Once you sit down, we'll let Dr. Shewmon check what he wants to find out on that PTS issue.

MR. SHEWMON: I guess I have not heard about the plate before and this hope that they can simulate its properties. The plate had low upper shelf, which meant it had high sulfur?

MR. ELLIOTT: Barry Elliott. The plate had low upper shelf, it started with a low upper shelf and about 78 foot-pounds. The welds for the CE --

MR. LEWIS: Let's stay with the plate. I know it had low upper shelf energy and often that's because it has high sulfur. It's relevant because of the hope or assertion that somebody is going to make that they have simulated that steel and, indeed, have a good substitute for it.

So I'm interested in particular in knowing what it is you're going to match up between the two; if sulfur is one or if you have something else that makes them think that they have a good surrogate.

MR. ELLIOTT: We're going to look at sulfur and we're going to look at heat treatment.

MR. SHEWMON: Have they submitted a package on this yet?

MR. ELLIOTT: Yes, they have.

MR. SHEWMON: Can I get a copy?

MR. ELLIOTT: Yes.

MR. SHEWMON: And do they have sulfur in it?

MR. ELLIOTT: I haven't gone through that package in enough detail to answer that type of question.

MR. SHEWMON: Let's come back then to the PTS.

There are substantia shifts here and I have what I'm referring to as your handout from before. You don't give the initial values. Can you tell me what the initial were on the critical plates, the transition --

MR ELLIOTT: For the PTS issue, the plates are not limiting. It happens to be the welds are limiting.

MR SHEWMON: The initial for the welds, then.

MR. ELLIOTT: The initial for the welds is minus 56 degrees Fahrenheit.

MR. SHEWMON: On both of them.

MR. ELLIOTT: Yes.

MR. SHEWMON: Do they have good surveillance data?

MR. ELLIOTT: It turns out that they have surveillance data. It is not a weld from the limiting welds. It is something that is representative of the limiting weld. If you compare the results from the surveillance program to what is predicted by the reg guide, it's a very good -- the surveillance results are in line with what is predicted for the reg guide.

MR. SHEWMON: And you give two different welds in your handout which are a factor of four different in exposure or fast neutron fluence. Are those then all similar to the critical welds?

MR. ELLIOTT: I think you're talking about the surveillance results?

MR. SHEWMON: Yes.

MR. ELLIOTT: That's the same weld, that's the surveillance weld, as the weld I described that is similar to the axial weld that's limiting.

MR. SHEWMON: I see. It's the same material, it's just different capsule numbers because they were different capsules.

MR. ELLIOTT: Yes.

MR. SHEWMON: What is the current fast fluence?

MR. ELLIOTT: I don't know the actual current fast fluence --

MR. SHEWMON: Or what's the expected end of life?

MR. ELLIOTT: I haven't figured that out, either, but I know that the target fluence to reach the screening criteria is approximately 1.6-times-ten-to-the-ninth. They will reach that sometime in 2000.

MR. SHEWMON: Combustion has traditionally been less concerned about the fast fluence that their vessels take than most other companies. They came in with their advanced plant and they were still talking about going times-four-times-ten-to-the-ninth or something like that. So it's a hot plant.

MR. ELLIOTT: The problem this plant has is that it has a moderate amount of copper, but it has very high nickel, and that's the problem with CE plants. If they can get the copper down and the nickel down, they probably could go four-times-ten-to-the-ninth.

MR. CARROLL: You might mention the Diablo data that's relevant to his question.

MR. ELLIOTT: We have Diablo Canyon data. For the axial weld, it's simulated by their surveillance program. Their circumferential weld is a different process, but it turns out that the exact weld process and heat of weld is in Diablo Canyon's surveillance program. If you compare the Diablo Canyon surveillance weld to the reg guide, it also shows that the material is behaving as predicted by the reg guide.

MR. SHEWMON: As predicted with or without margin?

MR. ELLIOTT: I'm talking about just mean value, without margin.

MR. SHEWMON: Are there other questions I should ask?

MR. CARROLL: Not from yesterday, at least.

MR. SHEWMON: So with the current shielding -- I was interested in the diagram you had that talked about hafnium absorbers being in the fuel rods. Are those hafnium tubes that are then put in the passage ways that the control rod spiders go through?

MR. ELLIOTT: No. They're in guide tubes and the guide tubes are normally used for instrumentation and these replaced that.

MR. SHEWMON: So they take the regular spent fuel and modify it by putting these additional absorbers and then put them out there for not shielding, but flux reduction.

MR. ELLIOTT: Right.

MR. SHEWMON: A fine point somehow I missed.

MR. CARROLL: Those are the ones in the three positions. The ones in the two are just --

MR. ELLIOTT: Regular --

MR. CARROLL: But they're not in the hot corners or hot sides.

MR. ELLIOTT: They're not near the -- in putting the thrice-burned hafnium absorbers assemblies near the welds that are critical to bring the flux down.

MR. SHEWMON: And the tubes are thrice-burned but no hafnium?

MR. ELLIOTT: Twice-burned. No hafnium.

MR. SHEWMON: That's what I thought it meant, but no hafnium. And that will get them to 2001 and 40 years from when?

MR. ELLIOTT: 2007.

MR. SIESS: Forty years from CP?

MR. ELLIOTT: Yes.

MR. SHEWMON: Fine. Thank you. That's all I needed.

MR. CARROLL: But your view is that there are additional flux reduction things they can do to --

MR. ELLIOTT: I don't think there are flux reduction things they can do anymore. I think they've reached just about the limit of flux reduction. They're going to have to go to the pads.

MR. SHEWMON: The pads are over the welds is why pads are an option in this case.

MR. ELLIOTT: Right.

MR. SHEWMON: How thick are the pads?

MR. ELLIOTT: They're still looking at that. They haven't decided what to do yet. That's about the only thing they can do as far as limiting the neutron fluence.

MR. SHEWMON: Any particular problems with welding or getting the core barrel -- sorry -- with annealing or getting the core barrel out of there?

MR. ELLIOTT: I haven't looked at that. They are going to look at all these issues when they decide what they're going to do next.

MR. SHEWMON: According to the PTS rule, given that they won't get to end of life by 1995, they have to have a package in.

MR. ELLIOTT: Yes. Three years, I think --

MR. SIESS: 1998.

MR. SHEWMON: Thank you.

MR. HOLIAN: With that, I'd like to introduce Mr. David Vandewalle from Consumers Power Corporation, the Director of Safety and Licensing. He has 17 years nuclear experience, 12 associated with Consumers Power Company.

MR. VANDEWALLE: I'll try to keep this short. I understand you have a Christmas lunch coming up. As I was introduced, my name is David Vandewalle. I'm Director of Safety and Licensing at the Palisades plant. I want to just talk briefly about Palisades plant, Palisades plant mission, recent operating history of the plant, major modifications since the systematic evaluation program was completed, and very briefly on the steam generator replacement project and other outage activities.

[Slide.]

MR. VANDEWALLE: Regarding the Palisades plant, we have a mission and it's important to us. It may sound a little bit like motherhood, but our mission is to provide safe, reliable, cost-effective power so that we become recognized as one of the top ten nuclear plants in the United States.

We look at the performance areas that I've listed here as a measure of our performance and we use the INPO performance indicators to determine how we match up with the rest of the industry in these performance areas.

Our objective is to be top ten in 1992 and we have defined top ten as being at least top quartile in each of the nine INPO performance indicators that pertain to the pressurized water reactors. Those indicators include the -- the important ones include unit availability, unplanned scrams, safety system actuations, radiation exposure, industrial safety, forced outage rate, among others.

But our objective is to be top ten, recognized as top ten by our regulators and we believe we will be recognized as top ten if we can reach at least top quartile performance in all of the INPO performance indicators.

[Slide.]

MR. VANDEWALLE: Talking a little bit about the operating history of Palisades, people have talked about a lot of this. I wanted to start with 1986. Prior to that time, we have been described as an average plant. In 1986, we once again came under scrutiny from the Nuclear Regulatory Commission due to declining performance of our maintenance activities. We heard the same words regarding Dresden.

NRC observed, we observed problems in the material condition of the plant equipment. That manifest itself very vividly in a trip that occurred on May 19, 1986, when we lost control of our turbine and resulted in a turbine trip and then a reactor trip. Following that trip, a number of important pieces of plant equipment did not perform as they were intended to perform.

The regulatory action that followed was a confirmatory action letter that required the plant to be shut down or remain shut down until certain actions were taken to improve performance of the plant. Those three major activities that occurred during that outage, which lasted for about a year, we conducted what we called a material condition task force. The material condition task force had as its objective to identify all of the material problems in plant systems important to safety and reliability and to correct those problems.

We accomplished that. We made major improvements to the condition of the plant during that outage. We also scheduled over the following five years through our five-year plan a number of additional material condition improvements to address plant aging problems, among other problems.

We also conducted what was titled our system functional evaluation, which was assessment of the major plant safety-related systems to determine if we were testing those systems appropriately to assure that they could perform all the functional requirements that they are required to perform for normal operation in accidents.

We also initiated at that time our configuration control project, recognizing that we did not have a complete understanding of the plant design basis. We initiated this project and its primary objective being to fully recover the documentation and design basis of the Palisades plant for the Palisades important safety-related systems.

As I mentioned, the plant returned to operation in 1987. Since that time, we've seen a number of indicators of improving performance at this plant. I'll just mention a few of those. We've seen a significant improvement in the reliability of the plant equipment, with the exception of the steam generators. That has manifest itself in improving operating runs for the plant and, in fact, three of the longest -- three of the seven longest runs in the history of the plant have occurred in the last two years.

Our capacity factor lifetime is still low, one of the lowest in the industry, and our capacity factor over the last several years continues to be low. That is due for two reasons; one, we've continued to have problems with the steam generators; we've had two forced outages during 1988 and 1989 as a result of the steam generators. We've also planned two maintenance outages during that time between our refueling outages to continue our material improvement efforts.

Those maintenance outages were important so that we could continue those efforts, but they have resulted in a lesser capacity factor than we otherwise could have attained during that time.

Also looking at our performance, you'll see, we see an improving trend regarding the number of automatic scrams that have occurred at the plant. We also look at the percentage of preventive maintenance activities relative to total maintenance activities at the plant.

And whereas prior to 1986 when we undertook this improvement program, fewer than ten percent of our maintenance activities were preventive maintenance activities. Today preventive maintenance accounts for more than 50 percent of our maintenance activities and even higher percentages in some maintenance disciplines.

Lastly, I'd just like to mention that we also see today an extremely high level of teamwork occurring at the plant among the maintenance people, the operations people, and the engineering people. Both INPO in their evaluation, recent evaluation of the plant, and the NRC in recent inspections of the plant have remarked on the level of teamwork that exists at Palisades and, frankly, that teamwork is going a long way to improve the performance of this plant.

MR. SIESS: You did not include training people in that list of the teamwork. I know in a number of plants there's been apparently very little teamwork between the training and the operations people and, as a result, the training hasn't been too good. What is your situation on that?

MR. VANDEWALLE: We're working on that. We have had problems pointed out to us in that area. We've recognized problems in that area. We are working on that. Lastly, on this slide, because of the major piece of plant equipment that has effected plant performance over the last few years, the steam generators, we did make a decision in late 1989 to replace the steam generators. That has been touched on briefly previously. I'll touch on it a little bit more in a moment.

But we are presently in a replacement outage and refueling outage.

[Slide.]

MR. VANDEWALLE: I wanted to briefly describe some of the major modifications that have occurred to Palisades since the systematic evaluation program was completed. We upgraded our auxiliary feed water system to add a third auxiliary feed water pump. It's a motor-driven pump, in addition to the two motor-driven -- in addition to the motor-driven and steam-driven pump that we previously had and that was original plant equipment.

That was done as a result of a TMI action plan requirement, as well as to address known single failure vulnerabilities of the previous -- of the original auxiliary feed water system. We've made major steps in the upgrade of our off-site power supply. We have added a second immediate access circuit between our station switch yard and the plant safety-related buses. This new immediate access circuit is an underground circuit, whereas the original immediate access circuit is above-ground in the towers leading into the plant.

We have also added a motor-operated disconnect between the main generator and the station power transformer, and that permits us to quickly provide backfeed through the main transformer and station power transformer to the safety-related buses in the event the plant is out of service and the normal supplies are unavailable to us.

MR. MICHELSON: On your auxiliary feed water, what provisions do you have to prevent steam generator overfill from the auxiliary feed water?

MR. VANDEWALLE: We control the amount of feed water provided to each generator. It's set at about 300 gpm to each generator through flow controllers and we rely upon operator action to terminate them.

MR. MICHELSON: But if your auxiliary feed water is feeding the generator and your operator doesn't notice that it's getting full, there is no trip on it.

MR. VANDEWALLE: That's correct.

MR. MICHELSON: Because the only trip you did tell me about is over on the main feed water, and that's already gone or you wouldn't need the auxiliary feed water.

MR. VANDEWALLE: That is correct, but, of course, the timeframes are much slower.

MR. MICHELSON: It's much slower, but it depends on the scenario you name and when the auxiliary feed water came on; whether it came on spuriously or purposely and so forth as to whether you're in trouble.

MR. VANDEWALLE: We also upgraded our pressurizer power operator relief valves. We installed larger power operator relief valves to permit greater feed-and-bleed capability for the plant. We also upgraded the block valves and the discharge piping in response to TMI action plan requirements.

We are presently installing modifications required by the NRC ATWS rule, 10 CFR 50.62. We have added a considerable amount of instrumentation to the plant since the 1986 timeframe. We added this to permit us to do a better job of system performance testing to meet ASME Section 11 code requirements, and to allow us to more accurately balance flow in the systems among the various safety-related components. That became particularly important in our plant support systems, service water and component cooling water, that will be able to accurately balance flow within those systems and the instrumentation was added for that purpose.

Finally, we have made some major -- what we consider to be major improvements into our secondary system and we believe these are going to benefit us in the future operation of our new steam generators. I'll just mention those briefly.

We installed a reverse osmosis unit to provide sufficient supplies of high quality water for our secondary system. We've paid a lot of attention to maintenance of valves in the secondary system, and this has resulted in an extremely tight secondary system that INPO and others have remarked upon because of the very low amounts of air in-leakage that we've experienced.

MR. SHEWMON: What has the reverse osmosis got to do, enter the distilled water for your makeup or what?

MR. VANDEWALLE: To provide us with sufficient quantities of high quality makeup so that we do not need to --

MR. SHEWMON: That was cheaper or better than distilling it or any other way of cleaning it up out of the lake?

MR. VANDEWALLE: That is also true. It was more efficient and cost-effective to do it in that way. Finally, during the current outage, we are replacing the main condenser tubes and the feed water heaters with ones that do not contain copper-bearing materials. We're putting in a stainless steel condenser.

[Slide.]

MR. VANDEWALLE: Lastly, I wanted to touch on the steam generator replacement project which is ongoing at this time. We are very proud of the performance.

MR. CARROLL: Just out of curiosity, how did the evaluation of stainless versus titanium come out?

MR. VANDEWALLE: I can't answer that question. I don't know the answer to that. This is an overview of our steam generator replacement project. I won't spend any time on it. Mr. Holian went through some of the major activities involved in this replacement effort.

This was our original schedule. We're striving at that time for 150 days breaker-to-breaker for that replacement effort. If we were to accomplish that, we would accomplish the steam generator replacement at Palisades quicker than any plant in the country has been able to accomplish that effort.

To give you a status on that, this line here, we moved the new steam generators into containment and we were able to accomplish that 12 days ahead of schedule. We are presently expecting to receive turnover of the primary system from the prime contractor, Bechtel, in the next few days and we would expect -- we're expecting to be able to begin ..ueling of the reactor between ten and 13 days ahead of sc .e.

If all goes well from there, we would also expect to beat our schedule for returning the plant to service.

[Slide.]

MR. VANDEWALLE: The last thing I wanted to discuss briefly was our dose performance during this particular outage. When we originally scoped this job about a year ago, we estimated 640 man rem for the steam generator replacement effort. After we had completed our detailed planning and before this outage began, we revised our estimate and we established a goal of on the order of 500 man rem for the job.

If we were to attain that, we would perform the job for the least exposure of any steam generator replacement activity in this country to date. You see our progress to date. It's also noteworthy that we are about two weeks ahead of schedule and we fully expect to come in under 400 man rem for the steam generator replacement effort.

If you ask what is contributing to that, there's a number of things. In the last three or four outages, during the shutdown, we have conducted what we have called a primary coolant system source reduction effort, and that involved the injection of a controlled quantity of hydrogen peroxide into the PCS while two primary coolant pumps were running, and while we were able to use our cleanup systems in our chemical and volume control system to remove radioactive material from the PCS.

MR. SHEWMON: The oxidation or the oxidizing nature of that brings crude loose?

MR. VANDEWALLE: We described it as a controlled crude burst and with the cleanup systems operating, we could then remove that crude from the PCS, and we were able to remove large quantities. I'm can't tell you the amounts of Cobalt 58 and nickel from PCS during those activities.

It's manifest itself in significant reduction in dose rates in our engineered safeguards rooms and those are the rooms through which the piping for our low pressure safety injection system, shutdown cooling system run. So we've seen significant improvements in dose rates in those rooms because of that.

Also, a lot of effort was put into deconning the ends of the primary coolant pipes after the cuts were made. The deconning effort was very successful. Fields in the region of the pipe ends are much less than 100 MR.

MR. SHEWMON: Is that electrochemical or mechanical or both?

MR. VANDEWALLE: Brian, maybe you can help on that.

MR. HOLIAN: No. I am not sure, either.

MR. VANDEWALLE: I can't answer that. I can get back to you with that information. In addition, because of that decontamination effort, the workers have been able to work in those areas without respirators.

All of those things lead to improved work performance, as well as reduced radiation exposure. The remote welding technique was mentioned. An awful lot of detailed planning went into this for us to be able to perform this activity on schedule and within the dose estimates that we were trying to obtain.

We did a lot of mock-up training. Finally, there was a contract incentive, a significant contract incentive to the contractor if he were able to reduce dose below targets and that comes into play here, as well.

That's the completion of my remarks. I'd be glad to attempt to answer any questions ACRS may have.

MR. SHEWMON: The flux reduction program that you've had, you put twice and thrice-burnt fuel in the outer boundary of the core. Has this resulted in any power reduction?

MR. VANDEWALLE: We were approaching that with the steam generator replacement. We're going to see a substantial improvement in PCS flow which we're going to take some advantage of in our core thermal limits.

MR. SHEWMON: Have you gone back and done a revised ATWS calculation -- ATWS -- that's not what I'm talking about. LOCA ECCS calculation?

MR. VANDEWALLE: Yes. We have revised our LOCA analysis for the increased peaking factors and changes in flow rates.

MR. CATTON: Don't you push DNBR a little more?

MR. VANDEWALLE: In fact, DNBR has become less limiting because of the increased flow rates. Our primary limit now is LOCA on the fuel.

MR. CATTON: Do you do EM calculations, evaluation model or best estimate, or do you know?

MR. VANDEWALLE: We use evaluation model. Our fuel is also ANF fuel and we're not using a best estimate.

MR. SHEWMON: What does ANF mean?

MR. VANDEWALLE: Advanced Nuclear Fuels. They bought out Exxon. That is the fuel manufacturer. They also perform the safety analysis for the fuel.

MR. SHEWMON: And that allows one to use more modern techniques or their fuel is different than the other vendors?

MR. VANDEWALLE: The reason I said that is I don't believe they have a best estimate evaluation model at this point. I'm not sure about that, but I don't believe they have a best estimate evaluation model.

MR. CATTON: You're probably right that they don't.

MR. SHEWMON: That is all. Thank you.

MR. CARROLL: How have you been doing on INPO ratings? We heard about Commonwealth monotonically approaching an INPO rating of zero. How are you doing?

MR. VANDEWALLE: We never had an INPO rating of five. We were very pleased to receive an INPO rating of two during our last evaluation.

MR. CARROLL: Which has been fairly recent.

MR. VANDEWALLE: Fairly recently, yes, last summer. Our Big Rock Point plant did receive an INPO rating of one in the last evaluation.

MR. SIESS: Any others?

[No response.]

MR. SIESS: Thank you very much.

MR. VANDEWALLE: Thank you.

MR. SIESS: I'll turn the meeting back to the Chairman.

MR. MICHELSON: I think we're essentially on schedule. We will take a break until 1:30 to have some refreshments upstairs.

[Whereupon, at 12:01 p.m., the Subcommittee was recessed for lunch, to reconvene this same day at 1:30 p.m.]

AFTERNOON SESSION

[1:34 p.m.]

MR. MICHELSON: The meeting will come to order. The item on the agenda for this afternoon is the talk that we had asked for on rad waste. Hal Lewis, I believe, has volunteered to make the introductions for us. If you will, Hal?

MR. LEWIS: I don't think I volunteered, except in the military sense of the term, but I found my name on the agenda. I don't think there's anything that needs to be said. There was released about three or four months ago, I guess, a National Academy/NRC, which we consider the other NRC study on high level waste disposal which is a problem that I think we all know bedevils the industry.

It also makes problems for some of us who try to figure out where the risk issues are on it. I personally thought that the Academy report was really excellent. We're going to have that confirmed, so I don't want to say any more.

MR. MICHELSON: While we are waiting, it might be well to say that though the ACRS is not any longer involved in the high level radioactive waste disposal business, per se, we have a very strong interest in being informed as to what's going on. That's the reason for the discussion this afternoon.

[Slide.]

MR. PARKER: I should start off by saying that it's a real pleasure for me to be back here again. As many of you around the table know, I served as a consultant to this committee for many years and to its offshoot, the Advisory Committee on Nuclear Waste.

MR. LEWIS: I have to say that whenever people start off by saying it's a great pleasure to be here, I always ask, should we believe the rest of what you say on the same level?

MR. PARKER: Not necessarily. I would like to say a few words about the publication, the front page of which is shown here on the screen, and also a few words about the symposium that we had September 17th and 18th of this year, which is a followup to this retreat which we held in Santa Barbara in July of 1988.

I also want to start off with a little historical background. I don't want to just do this de novo, since I imagine that many of you have already had a chance to see the report. I'd like to give a little historical background.

I'm reminded that in the late 1950's, four of us met in a small room of the Cosmos Club and did our version of what today would be called the Multi Attribute Utility Analysis. After that, we decided that Lyons, Kansas was the place to do the work for the first geological disposal experiment in the world.

We came to that conclusion one afternoon and I went back to Oak Ridge National Laboratory and carried out that mandate. Things have obviously changed considerably since that time.

I do want to talk a little bit about the National Academy of Sciences and the National Research Council. Most of you know that the National Academy of Sciences was chartered and the charter was signed into law by President Abraham Lincoln. The purpose of the Academy was to provide advice in scientific and technical matters, upon request and without fee, to the Federal Government.

So, without fee means that everybody that does this work is a volunteer. It's also interesting to look back and note that it's 35 years now since the Academy published a document on radioactive waste, so it's not new to the Academy.

Most people are familiar with one of them, but when I give this talk, most other people are not aware that the first BEIR Report, the Biologic Effects of Atomic Radiation had a major section, one of the six sections in it that dealt with radioactive waste disposal. That was in 1955.

I'd like to quote from that document because you can see how committee proceeded under Abel Wolman's direction -- now deceased. They said about the items that require further study, and I quote, "Geophysical and Geochemical aspects of ultimate disposal of highly radioactive wastes, site selection for various nuclear facilities, particula. :. chemical processing plants and their location with respect to suitable waste disposal areas, transportation of highly radioactive materials, and the relationship of introduction and development of nuclear facilities to basic public health, social and economic situations extant or resulting from such development."

Now, the document that most people are familiar with, of course, is the report that came out in 1957, a result of a meeting in 1955 which called for considering deep geological disposal as the best place to get rid of high level radioactive waste and particularly recommended sodium chloride as the first medium that one ought to look at.

Later, in 1966, John Galley and King Hubbert wrote a report which was very critical of the waste disposal activities of the Atomic Energy Commission. Those of you who know King Hubbert, you know how c-itical he can be.

This report was not issue You may also be familiar with the fact that Phil Boffey in his Brain Bank of America, which described the work of the Academy of

Sciences, pointed that out very strongly and said that the Academy had been coopted and was a handmaiden of the AEC.

That report was subsequently issued, of course, and it's taken a long time, though, to overcome that perception among a number of people; that the Academy committees were the handmaiden of the nuclear energy industry. I think that has been overcome over the last 10 years or so.

I think that's also true of our relationships with the Nuclear Regulatory Commission and the Environmental Protection Agency. Most likely it became clear to everybody when, in 1985, the Board was -- when I say the Board, I mean the Board on Radioactive Waste Management of the National Academy of Sciences National Research Council -- I'll just say the Board from now on to save time.

The Board looked at the high level waste siting selection process of the Department of Energy had chosen. We stated our views of it. I'll quote again: "The methodology of comparative assessment is unsatisfactory, inadequate, undocumented and biased and should be reconsidered." End of quote.

I think it became clear we didn't like what they were doing and that we're no longer their handmaidens.

MR. CARROLL: That's what that meant.

MR. WILKINS: They didn't say, scrap it.

MR. PARKER: The Board and the Academy, I mentioned earlier, respond to requests from the Federal Government. The Academy also has some seed money of its own and also has some co-funding occasionally from some of the agencies.

So, this retreat that we held at Santa Barbara in July of 1988 was initiated by the Board. It was not done at the request of the Department of Energy. I thought I ought to say a few words about what led up to our decision to call for such a retreat.

The Academy Board had been looking at the Waste Site Selection Pilot Plant for over ten years and had issued over ten reports on the Waste Site Selection Pilot Plant. During the course of that, we have learned a great deal about the advantages and disadvantages of geological disposal and all of the surprises that one finds when one goes underground.

We also learned about the difficulties in meeting guidelines if you adapt a deterministic model for performance assessment if use worst case analysis and the difficulties of defending the best estimate analysis. We also learned of the difficulties if you use a probabilistic or stochastic analysis; that if there's a great deal of uncertainty -- and in these kinds of environments, that's practically guaranteed -- that if there is so much uncertainty, then the distribution functions will have such long tails that those tails will really wag the tail of the dog and it will be very hard to meet those criteria.

As I mentioned, we also reviewed the siting guidelines for high-level waste, including the surge selection, which was salt, basalt, crystal and rock, and tuff.

We also had the former chairman, myself, and the present vice chairman, who had served on EPA's Scientific Advisory Board Panel when they evaluated 191. So we knew in great detail all of the work that had gone into establishing 191 and what the strong points were and what the weak points were.

I have to say that that Advisory Panel was not very happy with the amount of attention that the EPA paid to our report. EPA would brag that they had done 95 percent of the things that we had suggested, and that, in fact, was true. They said that 95 percent of the water was used for irrigation. We pointed out that it was really five percent, and they made that change.

[Laughter.]

MR. PARKER: But the major efforts, the things that we didn't like, really didn't like, the basic methodology, they ignored, and it's somewhat like horse and rabbit stew -- one horse and one rabbit.

We also had been very active on international problems on waste disposal. Many members of the board had been involved in either review or actually working in other countries on high level radioactive waste disposal problems. We felt strongly that the U.S., which at one time had dominated the research in this field, was on longer in that position; and, therefore, we had to pay much greater attention to what was going on abroad.

Then finally, we felt very strongly unanimously that the strong uncertainties expressed about outcomes 10,000 years from now were fallacious; that the uncertainties were so great that they most likely would dominate everything, and that one had to take this into account.

So, with that as a background, I'd like to get to the Santa Barbara report. I might say that practically everything that subsequently appeared in that report, if you take out the word "high level radioactive waste" and substitute instead "hazardous chemical waste," you can say almost the same things about it.

Well, when you do want to get people to do this kind of thing, and take a week of hard work, you have to give them a nice environment. So that's the reason we met in Santa Barbara. It is a nice environment.

We had to also tell everybody that it was going to be off the record, it was going to be informal, and we sought multiple points of view, both technical, philosophical, and rational.

We had at the meeting DOE's head of the Office of Civilian Waste, Bob Bernero from NRC, Rich Guiman from EPA, and we had people from Sweden, France, the United Kingdom. We had academicians, we had practitioners. We had the whole suite as far as we could think of covering it.

Within the number of people that we wanted at the meeting, we tried to restrict it to 25. If you get much beyond that, we can't have that kind of free exchange of information.

All of the members of the board participated, and we divided up into four sections, and each member of the board took responsibility for the agenda for each of those sections.

We came up to finally publish this document which is shown on the board. In the beginning of that document, we do talk about the advantages of the present system, the system that's in place now, the EPA/NRC system.

We say in the report that the present system facilitates rigorous oversight and technical auditing. The goals and standards are clear. It creates a sense of confidence in planning and operation of the repository, and, if carried out according to the specifications, it would be robust in face of administrative and legal challenges.

But we believe, and our report, of course, says this, that the present approach as outlined in the legislation, the regulations, and in the practice, and I want to emphasize that, is almost certainly doomed to failure. The reason we believe that's true is because of the subject of the report.

We feel the present program is not a socially satisfactory resolution of the problem, and for two main reasons. One is the nexus -- and those of you who heard Commissioner Curtiss talk at our symposium will appreciate that word -- the nexus between nuclear energy and waste disposal.

We made it clear right off that we were not going to take a stance on nuclear energy, the advisability or not of the utilization of nuclear energy. Most of you are familiar with the CONAES report of the National Academy of Sciences, and every time they are asked to redo a report like that, they consistently refuse, and I think most likely for good reason.

We pointed out in the report that even if nuclear energy ceased tomorrow, nuclear power plants ceased tomorrow, -- a very unlikely event -- that the waste problem would still be with us, and so we'd have to solve the waste disposal problem, and that is irrespective of what's done about nuclear power.

[Slide.]

MR. PARKER: The second item is we felt that the US program was flawed and faulted in the way the programs are designed, and we felt that the US position is unique in that it's different from every other country in the world.

Now, this isn't from our report -- it's from another report I did at a different time -- but it deals with the performance criteria for different countries around the world. You can't see it, but the ID stands for individual dose, CD stands for collective dose, and these are given in Milli Sieverts per year.

I want to point out that the two things that distinguish the US program from all other countries is that it not only has an individual dose, it also has a collective dose, and it also has criteria for each of the barriers. That is absolutely unique, as far as I know, in the U.S. All the other countries use solely a risk or a dose criteria.

Now, those criteria for each barrier are very familiar to you since they're the NRC's criteria, and that is a thousand-year travel time of groundwater in the undisturbed environment, the leach rate of the waste package, and the thousand-year lifetime of the package.

The reason why we feel that that's wrong is they do not necessarily have anything to do with reaching the goals -- namely, protecting the human beings and the environment.

I can give you a couple of examples of that. We can think of a disposal facility in salt, a wet facility, for example, where the rate of movement of the waste is going to be extraordinarily small, and yet, because of the brine that will surround those canisters, the rate of corrosion in the lifetime of those canisters could be very small, and have no effect whatsoever on the transport of the radionuclides.

The same thing in crystalline rock. We can think of a very fast movement of the groundwater, and yet no practically no movement of hd radionuclides if the canister is properly designed. So we don't see that they necessarily have any effect whatsoever on the two primary goals, protection of the humans and protection of the environment.

Notice that every other country only talks about protection of human beings, and we think that the goals ought to be broadly based, such as is done in other countries.

[Slide.]

MR. PARKER: We talked about four major topics, and I would like to go through the various topics. The first one we talked about was modelling and its validity in the geologic processes. We called attention in our report to the variability of the natural and the geologic environment.

We come out strongly for models. I want to make that clear; sometimes, that's been missing. I should also say about the goals -- there are a number of people who, even up to this last weekend when we had a meeting here in Washington on the topic, consistently misinterpret what the report says. We have not called for any change in EPA's basic goals on human health. We have not said that that number is too big or small. We're just saying that how you reach that goal should be relaxed, and that the proponent of the system should have a great deal of leeway to design the canister and the back-packet and the full waste package so that he can meet that goal.

We believe that models are indispensible, and the reason we believe they are indispensible is they can be used in an inverse fashion to determine the history and the present characteristics of the site. Can you use those models to get to where we are today, geologically? Of course, even more importantly, what is the future going to be? We cannot come flat out and say that there is not a single future. We don't know that. Otherwise, I wouldn't spend my time here; I would be at the stock market or the race tracks.

We don't know what the future is going to be. We certainly don't know what it's going to be like in 10,000 years. So what we say in the report is that we need to predict a variety of outcomes and look at what those consequences might be.

We point out how confident we ought to be about some of these models, and we state pretty flat out that there ought to be a good deal of humility in our use of these models.

If you take high level radioactive waste disposal in geologic formations, all of us know that transport by groundwater is the major mechanism by which these wastes will move. Usually, except for salt, we're talking in general about fractured media.

If you do an ex-post analysis and look at how successful we've been in just modelling transport of groundwater in very uniform environments, not fractured environments, you see that we've not done that well, and we know more about movement of groundwater than any of the other topics that are dealt with in a performance assessment of a high level waste repository.

We know more about uniform environments than we do about fraction environments. In these models that the ex-post analysis has been done for, we do not have to take into account the joints, the fractures, the scale factors.

That's not what was done there.

Yet, even with that review -- it was done by Len Konikow of the USGS -- even in his review, he points out -- he's a very well known modeler -- points out how poorly we do. So models have a role, but it's in a comparative rather than in an absolute sense.

We point that out, that uncertainty is not taken into account in the present regs, at least in practice, and that there will always be an irreducible amount of uncertainty. We have to take that as a given.

Yet, we also point out and say that there's a worldwide consensus that geological disposal is the way to go, and that most of us, I think, in fact, all of us believe that it's possible to design and have a system that is at a level of risk that is compatible with other levels or risk that we are willing to assume for our other activities.

We think that we can learn over time how to achieve reasonable assurance, and that the uncertainties can be bounded. We point out again that they should not be taken in a quantitative sense and should not say that these models are predicting precisely what will take place.

The tendency has been to present the results of these models as though we had perfect knowledge. In fact, that's not the case. I'm always amused and I might say amazed when I see these models carried out in the ten to the fifth years, ten to the sixth years, ten to the seventh years, ten to the eighth years.

I'm waiting for them to go to ten to the ninth and then, when we get beyond our expected age of the sun, and have people still calculating about how we ought to worry about where those nuclides are going to be at that time.

We also point out that we ought to be looking at realistic alternatives. I'll come back to this a little later on, but it's a point that I know the NRC and the ACRS have been concerned about. Do we want storage at 100 sites? Do we want 100 de facto MRSes? Do we want a single MRS or a repository?

When we compare the results, we ought to be looking not at an idealize repository, not a repository where there's no permeability, where there's no movement, where there's no fractures, there are no joints; we ought to be looking at what is a realistic environment. So we also ought not to be looking at what is absolute safety.

We've taken as a given that the definition in EPA regs, the goal in EPA regs, is the safety goal that needs to be achieved. It's clear that if one calls for absolute safety, zero risk, then the game is over. There is no such thing.

[Slide.]

MR. PARKER: We also invited a number of

philosophists, ethicists, to join us, and we looked at a variety of topics. One broad-based topic we looked at was "Equity," and we said, Who does the work? Who gets paid for it? This differs depending upon whether we have at reactor disposal, or we have a single-storage disposal facility.

Under "Legacy," we said, What do we owe the future generations? There is almost universal agreement that the present generation should be responsible for the waste since they have reaped the benefits of those wastes. Once you get acceptance of that general principle, though, it's very difficult to figure out how to put in action in such a way that will satisfy everybody.

For example, there are people, utilities, who believe that the Government, the Department of Energy, has a contractual obligation with them to take their waste from them right now. Environmentalists think that the polluter should pay is a valid principle.

There is another group that says that better techniques are going to be available in the future. We're going to learn a lot more about the future. It's kind of silly to put those things away now, when we don't know as much as we could know if we waited awhile.

Then there are other people who say, Hey, those aren't really wastes. There is valuable material in there, and, as most of you know, there is as much energy in those as there is in all of Saudi Arabia, potential energy, and it's crazy to call that waste and to dump it.

Finally, we said let's look at Locus, meaning, Who benefits and whose exposed to the risk? We came to the conclusion that what we ought to be looking at is the ethical problem as well.

[Slide.]

MR. PARKER: There are a number of questions we need to ask on that.

I mentioned already that part of ethical problem is that this generation ought to take responsibility, but then there's a more pervasive public policy question that we've not handled very well in this country.

That is, there are many people in many parts of the country that have benefitted from nuclear power but there's only going to be one or maybe two geological repositories so the impact is going to be felt very locally.

The most important thing we saw in this is that there ought to be a fair process, that there ought to be truth in advertising.

We found that the regulations almost demand that the DOE promise a great deal of certainty and DOE responds by promising a great deal of certainty. That's such obvious nonsense that anybody can figure out that that is not going to be the case at all.

Under a fair process people who are going to be subjected to the effects of a repository both positive and negative want to know is there a need for a repository? Why do we need a repository?

If these materials really are valuable, shouldn't we just store them and then later on retrieve them and reprocess them or maybe as I mentioned earlier wait until we know more about it.

The second item is siting. Again, it should be a fair process. It should not be an arbitrary choice. The search should be objective, scientifically credible and procedurally fair.

Nevada as you know has raised a lot of devil about the process. What they conveniently forget is that after the 1982 Act when the search was carried out Nevada at that location, Nevada was one of the nine sites, then one of the five sites and then one of the three sites. It was only after the '87 Act that that site was chosen as the first for characterization.

The next item is intergovernmental sharing of power. Again, in this country it's something that is a necessity. It's not true in all of the countries. We did a survey by the way of what was going on in various countries.

The public must be taken into the process. It's doomed to failure unless that occurs and this involves negotiation, persuasion and compensation.

We dealt with safety -- again, reasonable standards of proof and a fair evidential process both in the regulations and in the implementation. We have had a lot of discussion with members of the Staff of NRC who point out that variances are allowed. The regs certainly call for that. But when we have looked carefully at the implementation we find that variance and that flexibility is not always there.

We also feel that DOE should not promise more certainty than can be delivered.

Impacts -- we talked there about the distributional effects both technical, social and political. How to determine the compensation for the stigma, which may be only psychological?

So there are a lot of things that one needs to take into account under ethics and equity and the conclusions we reached in the report on that was that there is no single group that has a single, that has an exclusive claims for rationality or speak for the public interest, that fairness is subjective and changes over time and the search is for acceptability, not certainty.

[Slide.]

MR. PARKER: Then we go to what does it take to instill confidence in disposal?

That is really the name of the game. You cannot prove in the absolute sense that most of us think of scientific proof, you cannot prove that anything is going to be risk-free over these long time periods and so you want to hope to build trust and confidence.

How do you build that trust and confidence? We had some suggestions.

One is remoteness. It's obvious that you would think that you should not put it where populations now, dense populations now exist though I was told just this weekend by one of the critics of the program that that's really where you ought to put it because those are the people that have benefitted from nuclear energy.

When we are talking about a problem that is ten thousand years long, according to the regs, what do we know about where the population will be in ten thousand years or where was the population three hundred years ago in this country? Or take England -- you can look back three hundred years and you'll find areas that were densely populated at that time in England that are practically ghost towns today, so we can't say very much about what the population or where it is going to be or what its characteristics will be, its food habits, what its medical capabilities will be.

There's engineering design. We came out strongly for a conservative engineering design. We have been distressed, some of us at least, for a long time that the Department of Energy has not been verv concerned in most instances about its design. It's called for higher temperatures than are necessary where the scientific uncertainty is greater and we feel that you ought to go at least to something that would reduce the scientific uncertainty.

I suppose in the ultimate, one ought to go to something that is thermodynamically stable but as a minimum one ought to think as a fall-back position something like the Swedes have done with these thick copper canisters that will last 100,000 years or more, or are projected to last that period of time.

One should not be at the point where one is designing for a thousand year canister but should be able to meet these long-term criteria and then remove from that if one can show conclusively or relatively with great certainty that in fact that would be a safe design.

Mathematical modelling -- models alone cannot prove that the repository is safe nor can they resolve public concerns about the repository

I've already said that we feel models are indispensible that compare alternatives. You look at the possible consequences and it's the only way that one can have those possible events looked at and exposed to the public and to the critics and to the proponents so everybody sees exactly what was taking place and how those numbers were arrived at.

We feel it is important to do that.

But there are uncertainties in that. Those of you who've done modelling know perfectly well that the equations, the mathematical equations do not represent reality. They're simplifications of it.

The parameters that we put into those models, particularly for geological systems, are not as accurate as we would like them to be and maybe it's cannot be because of the heterogeneity and variability of geological environments.

We don't always know the initial and the boundary conditions and we don't always know what the forcing functions are going to be so we want to be fairly careful about that.

Performance assessment -- we believe and there is ample evidence to show that in those countries that have carried out performance assessments of their high level waste repositories, which we have not done -- Sweden led the way in that. The Swiss have done that. The European Community has just issued a marvelous report on that. The PAGIS Report that calamitous events are highly unlikely, that we can't think of events that might lead to a Chernobyl or a Kyshtym or Cheliabinsk.

The public I don't think realizes that but there isn't that kind of potential energy in the system to have these calamitous events.

We believe that we ought to make more use of natural analogs. The public can understand that and also we have a longer history from these natural analogs than we can ever hope to have from any man-made devices.

One can think of Oklow, Cigar Lake, Alligator River -- there are a number of places where such analogs exist and they aren't checked on the performance assessment methodology and they certainly are more meaningful to the public than the mathematical models.

One item that we don't pay much attention to in this country because we are saying that it is absolutely safe and we guarantee that it will be absolutely safe is what if things go wrong? Europeans in general have been a little bit wiser and they say let's look at remediation. What if things do turn out differently than we expect them to be? How big a problem could that be and what could we do about it? That what's we call for in looking at that.

Finally, on confidence in disposal, we looked at expert opinion. What do wise people have to say about this, wise people outside the DOE?

DOE has been too inward-looking for too long.

[Slide.]

MR. PARKER: So, we called for an alternative approach. And, in this alternative approach we say you ought to look for show stoppers, that you ought to find out what are the largest and most significant uncertainties.

There are a lot of scientific problems associated with deep geological disposal that are absolutely fascinating. And that's what people like myself like to look at. But they don't necessarily have anything to do with the safety of the site.

In that sense, this is an engineering project, where one ought to be looking for those uncertainties. We believe we say this strongly in the report, that one ought to use an iterative performance assessment methodology.

One ought to get as a minimum -- as soon as one gets any information about the site, and that of course means getting on site, it means doing experiments in situ, that one ought to do a performance assessment, as crude as it may be.

Because this would help you identify the areas that are the most important in the performance assessment. Then you could concentrate your research energies on those particular areas.

I should say that this approach that we're talking about will be more difficult to document, audit and defend than the prescriptive approach that's the present one. But we think it's the only one that's going to work.

Say that there ought to be a flexible approach, that you ought to meet the problems as they emerge. We can't tell what the problems, all of what the problems, are going to be. So we ought to be able to fix the problems, because we can't anticipate all the problems. But the system ought to be resilient and robust.

Yes?

MR. SHEWMON: That part bothered me particularly when I read the abstract and went through what I could get my hands on. I guess what I'd like to hear more is what criteria. Because it sounds like, trust us, whenever we find something wrong we'll fix it.

What you would say is -- okay, if you would comment on that I would appreciate it.

MR. PARKER: Sure. This is sort of the reverse of a mine, in the geological -- and we know that there are a lot of problems when people design mines. They always have to make changes as they go along, because they find unexpected things underground.

And we're saying that you shouldn't be so bound that you cannot make those changes easily as you find these uncertainties, or things different than you expected when you first started out.

If you run across a fault that you didn't know. If you find you cross some high pressure water that you didn't expect, that you ought to be able to reverse yourself.

This actually was done in the WIPP facility. The WIPP facility was supposed to be extended northward towards the El Capitan Reef, which the challengers know would have been a big mistake.

Instead, at our recommendation, I think, and also at the State's recommendation, they extended it southward. So they got to a more uniform -- not a completely uniform, but to a much more uniform -- or a much better understood geological formation.

That's the sort of thing we're talking about. We're not talking about abandoning the requirements on safety for humans on the environment. We're not saying that at all.

What we're saying is that you shouldn't have, as you do have in this case, a 6300 page report that tells you how you ought to investigate the site, and not be able to make any changes.

I was at the Tiger Team -- this is somewhat an aside. I was at the Tiger Team closeout at the Oak Ridge National Laboratory last Friday. And some of you may know, the National Laboratory at Oak Ridge came out relatively well, particularly in comparison to Argonne's review.

The thing that was so amusing to me about it was, they gave them a great deal of grief about OSHA and quality control, and how that called for a very centralized and fairly rigid system to make sure that the ladders were the right size, the fire extinguishers were in the right place, etcetera.

Then the second comic was that how innovative and how top notch and how collegial the research group what, and what a wonderful place it was to work for that sense. The two, of course, are just opposites, antithetical, to each other. How do you marry those two?

I think that's the same problem that we have here. This cannot be treated strictly as a centralized system because you want the best research done and you've got to allow some leeway. That doesn't mean that you relax the overall requirements. I don't know if that's answered anything.

In fact, that's what we say in the very next bullet here, that it ought to be performance and not requirements driven. The problem ought to be defined very very broadly. This is in keeping, actually, with things that the Board has said for a number of years about the way DOE operates.

Some of you may or may not have seen a report that we published, or a paper that I gave a year a two ago at Waste Management, which details the history of the activities of the National Academy of Sciences on radioactive waste disposal.

The central themes that come through that are -- and that holds true here, though. We didn't always say it explicitly here, but I'm taking some leeway to talk about the whole problem -- that there is a need for more external review and input to the program, that there needs to be a more open process, that they need to adopt a systems perspective. They need to have a more flexible schedule depending upon the success in research and field explorations. And they need to take a longer range perspective.

You have to remember, we did this in 1988. I have to say to Admiral's Watkin's credit that some of these things have been instituted. Not all, but some of these things, have been instituted. Then, the final thing we say is that we ought to look at what the realistic situation is.

And we call, as you may recall, for NRC to do a few things. And, on page 35, it says what we think the Nuclear Regulatory Commission ought to do, and that they should reconsider their detailed licensing requirements for their repositories and look at what level of statistical or modeling evidence is really necessary, obtainable, or even feasible.

To what extent is it necessary to prescribe engineering design rather than allowing alternatives that accomplish the same goal.

What can be done to accommodate design changes necessitated by surprises during construction, and what new strategies -- for example, engineered features like copper containers -- might be allowed, or encouraged, as events dictate.

Then, finally, as some of you have already recognized and told me upstairs, that this is really the scientific approach. This is the way most of us have operated. You learn as you go. You don't try to justify decisions made on more limited knowledge. You change as you find out more.

We need to look at what is the risk of failure to act. Are we better having the present system in place, which is what we feel will happen if there are no changes made.

Then, I'd like to close with what one of my colleagues always says about a talk like this. He says, my grandmother could have told you that.

[Laughter.]

MR. PARKER: I'll be happy to answer questions.

MR. LEWIS: Your comment about trying to marry this kind of very detailed control of a place -- not necessarily high level waste -- and the research environment is, you know, one of the very disturbing features about everything that is happening to our country.

I would just report that I was at another laboratory a few months ago in which the laboratory director made a speech to the whole laboratory. I'm going to invent the number because I don't remember the exact number used. But he said, we spend about 20 percent of our time now meeting these very detailed waste management and clean up requirements.

Somebody asked where does that time and money come from. He said it comes from our research program, where else can it come from. It's a real problem.

MR. PARKER: I couldn't agree with you more. If you'll look at the major national laboratories now, in many instances you'll find that their budgets, 25 to 30 percent or more of their budgets, are going to this kind of activity. It's very disturbing from a researcher's point of view.

MR. SIESS: Frank, I may be cynical, but it seems to me that the points you have made in the report, you and your committee, are quite valid, if I make the assumption that there are people out there that really want to approve a repository and put stuff in it.

If I assume the opposite, everything they're doing makes sense.

Chalkboard? Yes, that you can write on.

[Pause.]

MR. PARKER: If we take this as confidence in disposal, and remember this is what I said we're really looking for, this is mine; this is not the Board's. I take this as 100 percent; I take this as zero. And here we have events. And this won't have a linear time scale.

And what we can say is that here one does a literature search; and that here one does seismic work, without doing any underground; and that here one sinks a shaft; here one does some sort of insitu exploration; that here one actually opens the repository. And say this is 1,000 years after the repository and this is 10 to the 6th years.

Then, I divide the community into four different groups. There are the people that are called the pro-nuclear nuts, that have a system that looks like this. Then I have the anti-nuclear nuts, who look like this. And then I have the technological optimists, who might look something like this. And I have the technological pessimists, who might look something like this.

And my conclusion is, this is our problem, these two groups. And nothing much we can do, nothing rationally we can do. The question is, can we reduce the differences between these two groups.

MR. SIESS: Now, your vertical scale is confidence that the public will not be --

MR. PARKER: No, confidence in disposal.

MR. SIESS: In disposal. Because if it were confidence in safety, could you put it at 100 percent before you start doing any of this stuff? Say an MRS? And the further away I put that stuff, the less confidence, the less I'm able to predict how well it's going to stay there. If I leave it up above ground, and go out and look at it every few years --

MR. PARKER: For how long?

MR. SIESS: As long as anybody's worried about it. When they quit worrying about it, they'll quit worrying about it.

MR. PARKER: I don't think that that's going to be acceptable to the majority of the people.

MR. SIESS: No; I don't think it is, either.

MR. PARKER: NRC itself says that 100 years is the, in its confidence rulemaking, 100 years is what they're willing to accept.

MR. KERR: Frank, I was interested that somebody wrote something like this. Existence of large databases and sophisticated computer models suggests erroneously that it is appropriate to design a geological repository as if it were a nuclear power plant or jet airlines, both of which have predictable attributes over short lifetimes.

MR. PARKER: Relative to a geologic repository. I guess we should have put that in there.

We were commenting upstairs, the numbers of WASH-1400, and the numbers you have today, haven't been changed very much.

MR. KERR: Nor has the uncertainty changed very much.

I must say I found the report illuminating, and I thought it was very well written.

MR. PARKER: Thanks, Bill.

MR. LEWIS: I did, too. You know, the question that jumps to mind is, is there any sign from anyone as to how it has been received?

MR. PARKER: We wanted to ensure that attention was paid to it. And I must say it's been asleep. But we didn't realize the demand that there would be for it. It's been absolutely extraordinary. But we held the symposium, and in fact, Commissioner Curtiss was the keynote speaker at that symposium. The idea was to try to get all the players together. That means not only the Government players, but everybody else that's involved -- the State of Nevada, et cetera. EPRI has said that they would like to try to continue that process.

One of the things we said in there is that, by design, our very last speaker was that a person who works on negotiation, and that possibly negotiated rulemaking on a number of these very contentious items, ought to go forward.

The Department of Energy has just issued, I guess as of yesterday, a response. Admiral Watkins issued a press report right after it was released and gave it very high marks, but he said he wanted a more detailed review of it. That review was carried out by John Bartlett and his group, and I think a draft has just been made public; and I was remiss in not introducing him. But he wasn't here, as a matter of fact, when I started.

The Executive Director of the Board of Radioactive Waste Management, Dr. Peter Meyers, is sitting right there in the front row. And if anybody would like a copy, who doesn't have a copy of the report, if you would give your card to Peter, he would be happy to make sure that you get one.

Yes, Paul?

MR. SHEWMON: I guess my question, in a sense, is covered by your negotiator at the end. But I wonder if Mo Udall was there, somebody who has been involved in trying to get something through Congress the last time?

MR. PARKER: His staff people were there. I think it was favorable, but I don't think they're going to touch it. the meeting I was at this weekend, which was the Robert Redford Institute, which tries to get involved, his brother, Stu Udall, actually was the chairman of that group, and there were a number of staff people there, fairly high-level staff people. And they say Congress isn't going to touch it unless they are absolutely forced to. They don't want it. They don't want to fool with it if they can avoid it.

MR. SHEWMON: Which means for another ten year, utilities build sites on reactors; and we hope that it's different then, right?

MR. SIESS: Might go 100 years, Paul.

MR. CARROLL: And the ratepayers continue to put in the mil per kilowatt hour.

MR. PARKER: There was a prediction by one of the Public Utility Commissioners that they're not going to allow it.

MR. CARROLL: That's what's going to bring it to a head, I think.

MR. PARKER: I think that's right.

MR. SIESS: Of course, the price keeps going up, the longer we mess with it.

MR. PARKER: That's true.

MR. SIESS: We're still having escalation.

I suppose, in 100 years, you wouldn't want to predict whether Congress might want to change the law? That's in the same category as geology, volcanology.

MR. PARKER: Chet, you may recall that I said I thought this report would turn out to be a sleeper. I was also involved, as you probably know, with the Monitored Retrievable Storage Review Commission, which, when it was issued, promptly sunk into a black hole. And in that, the third recommendation was that, in ten years, that Congress ought to reconsider the issue, because there would be more certainty about what had taken place, plus, at that time, reactors would be coming closer to the license's lifetime, et cetera. And Congress said, Congressmen, whom we'd briefed, said, no way, we don't want to touch that damn problem again, despite the fact that they're looking at it every year, because it won't go away. So we were basically giving them a reprieve.

MR. SIESS: And at some point, we're going to have about 86 MRS's out there.

MR. PARKER: That's right.

MR. SHEWMON: Is there any feeling that one could wait a generation and then reprocess things, or is that so mixed up with proliferation that nobody will touch it?

MR. PARKER: What we said is echoing what the Nuclear Regulatory Commission said, and what the European Community has said, that there's no reason why you can't wait 40 or 60 years, or 70 years, coming up to 100 years. There's no technical reason that that can't be done. It's social, political, philosophical, and energy policy reasons. It has nothing to do with technical.

MR. SIESS: I'd call it a non-energy policy.

MR. SHEWMON: Then you'd be down away from this 10,000 years, that nobody can predict, to something which is closer to the lifetime of a country.

MR. PARKER: Well, I'll tell you what happened at the Science Advisory Board meeting with EPA. A number of us had plumped for 1,000 years. And EPA said hey, everybody else is calling for 100,000 years. We're giving you guys a break when we're talking about 10,000 years.

MR. SHEWMON: A different question, which is not your watch, nor mine, nor this group's, but it'll be interesting to see, in a generation, what our children do with the amount of plutonium that sits around under the military's control. You got to burn this darn stuff up someplace, someday, or else have a much bigger group guarding this stuff. And when we get to facing that one, it'll be interesting to see what they do with the high-level waste, in the process.

MR. CARROLL: It's easy to get rid of plutonium, once you make your mind up to do it.

MR. CATTON: Just drop it on somebody.

MR. CARROLL: No --

MR. SIESS: You know, you got me almost wishing to be around to see how i* comes up.

MR. PARKER: As you know, not necessarily that I'm a proponent of it, the Japanese and the Russians, and a number of people in the U.S., are calling for, very strongly, and the Japanese and the Russians have already done a lot of work on the way, on transmutation.

MR. SHEWMON: It's fairly easy to fission. You just put it in the reactor. Is plutonium a waste?

MR. PARKER: Under their views, possibly plutonium as well, but certainly the actinides in the long-lived fission products.

MR. SHEWMON: But then you're up into the actinides, which is, you can call it transmutation; I'll call it fission. "Burn it up" is another popular word. But it's the 10,000 year stuff.

MR. CARROLL: What is the situation abroad, generally?

MR. PARKER: There is no geologic repository in operation any place unless you call the near surface storage facilities of the Swedes for the spent fuel. The disposal of low level waste, again, it is a geological environment, but it's near surface.

MR. SHEWMON: What do the French do? They're active in reprocessing?

MR. PARKER: Very actively reprocessing.

MR. SHEWMON: What are they committed to do with their stuff?

MR. PARKER: Geological repository. They're searching for a site, but they've held off now for -- they've -- despite their more centralized government, they've been forced to hold off now for a year or so.

MR. SHEWMON: Are they looking inside France?

MR. PARKER: Inside France, yes, not in the colonies, inside France. They've identified the sites, as a matter of fact, they've got 4 sites that they've identified.

MR LEWIS: If they were true to history, the French would look for a site in Germany and the Germans would look for a site in Poland.

MR. PARKER: Well, as you probably -- I know you know that the Germans bought a large share of that plant.

MR LEWIS: I wonder if we should try to keep a schedule. I think this has been an extremely helpful discussion.

MR. MICHELSON: We certainly appreciate your coming to speak to us, Dr. Parker. It has been a great pleasure and we would like for you to visit is when we'd like to be educated again. Thank you very much.

MR. PARKER: I wish I could agree with that, but I know a lot of the people around the table are very aware of all of this.

MR. MICHELSON: A lot of these people are far more knowledgeable than I am on it.

We're going to take a break, gentlemen, until a quarter of 3:00 and then our next item is certification.

[Brief recess.]

MR. MICHELSON: The next item on the agenda this afternoon is the Certification of Standardized Plant Designs, Charlie Wylie Cognizant Subcommittee Chairman will take the lead on this item.

MR. WYLIE: Okay. Thank you, Mr. Chairman.

The Subcommittee on Improved Light Water Reactors met on Tuesday of this week, December 4th. Jay Carroll, Carl Michelson, Dave Ward, Ernest Wilkins and myself were present at that meeting. The purpose was to review the staff SECY 90-377 requirements for design certification and, in particular, the recommendations regarding design level of detail for design certification under 10 CFR 52.

We had presentations by the staff and comments by NUMARC and we reviewed, at that meeting, the information required for implementation for design certification under 10 CFR 52; the level of detail required, reviewed the staff's graded tiered approach to the identification of the level design detail required and the provisions for making changes to the designs after certification.

NUMARC provided its comments on the SECY. They agreed that the NRC needs information on which to base their safety determinations for granting design certification. However, they consider the requirements defined in proposing the proposed Reg Guide to be overly prescriptive, unnecessary and excessively costly.

We've asked the staff and NUMARC to come today and present a condensed version of what was told the subcommittee and I made a note that we have been requested by the Commission to prepare a report at this meeting. We have a draft that we've worked on and we'll make that available to you at the end of the meeting.

We'd like for you to consider, during the meeting, what you may wish to include in that letter. I'd point out that of concern is the amount of detail that is required by the staff in the various categories of design detail for certification and the flexibility for making changes after design certification.

I'll ask whether any of the other members have any comments they'd like to make before we get started?

[No response.]

MR. WYLIE: Well, hearing none, then I'll call on the staff to begin.

MR. MICHELSON: You might want to point out that the -- the SECY to tab 4 --

MR. WYLIE: Oh yes. Tab 4 contains the -- the SECY and information regarding this subject.

MR. MICHELSON: This hand-out too --

MR. WYLIE: Yes. We have a hand-out which contains information. The cover sheet is from Dr. Remick.

[Slide.]

MR. VIRGILIO: Good afternoon, gentlemen. My name is Marty Virgilio, I work in NRR in the Division of Reactor Projects. With me here today is Gene Imbro, and together, we'll make a presentation on the paper we've just provided to the Commission, SECY 90-377.

[Slide.]

MR. VIRGILIO: By way of background and overview, in May 1989, the Commission promulgated its new rule, part 52, reforming the licensing process in 2 ways: Seeking early resolution of key safety issues and promoting safety through increased standardization in the designs.

In the spring of 1990, the staff worked extensively with the Commission developing schedules and resolving key technical issues. In one spring meeting in April 1990, we raised a concern regarding the level of design detail and the level of standardization that would be achieved in this new generation of nuclear power plants.

In July 1990, responding to some questions from the Commission, we issued SECY 90-241. In that paper, we offered the Commission options with regard to level of detail and the degree of standardization that would be achieved.

In response to SECY 90-241, we received an SRM that included a number of questions. We've responded to that SRM in this recent SECY paper, 90-377. In that response, we've not only answered the questions that we were asked, but also provided some staff recommendations on the level of detail and degree of standardization that we think is appropriate.

In short, the staff is proposing the design be developed to a level of maturity that will -- to support decisions on safety matters and systematically achieve a substantial degree of standardization.

In addition, the staff is proposing reasonable controls that permit changes needed to construct and operate the facility that will limit compromises to the regulatory reforms envisioned as Part 52 has promulgated.

In today's presentation, we're going to talk about the graded approach to design finality, what we believe should be included in the application and the certification and the change process for the material that will be provided and retained in the vendor shop for audit by the staff.

[Slide.]

MR. VIRGILIO: Just to make sure we have a common understanding, in SECY 90-241, we introduced a number of terms, defined a number of terms and I wanted to just go over those once again with you.

With regard to the contents of the application, it has to be sufficient to support the safety judgments made by the staff, allow the preparation of construction, installation and procurement specifications by the applicant without recourse to significant degree of engineering, and allow the staff to judge the acceptability of ITAACs proposed by the applicant.

Tier I and Tier II was discussed. It's a formatting of the application into two parts: one part is the certified portion of the design, Tier I. Tier II is the non-certified portion of the design.

Material that's in the application -- material available for audit is material normally contained in procurement and construction and installation specifications. In SECY 92-41, we introduce the concept of four levels of design detail, Levels I through IV. We achieve these different levels by varying the content of the application, the content of the certification and the content of the material available for audit.

We demonstrated what this would look like by using the HVAC system as an example.

[Slide.]

MR. VIRGILIO: Again, by using that HVAC system example, we showed four different levels. What I have provided here are the definitions contained right in SECY 241. I'd like to say now, in general, following the staff's proposal contained in 93-77, our recent Commission paper, we will achieve a graded approach, based on safety, that will result in Level II or greater standardization for the more safety significant design features and lesser degrees of standardization for other design features, commensurate with their safety significance.

[Slide.]

MR. VIRGILIO: In SECY 90377, we propose that design details reside in three bodies of information. The first body is that which is submitted in the application and certified. The second body is that which is submitted in the application and not certified and the third body information is that information available for audit in the vendor shops.

What we envision the application itself to look like is an FSAR minus the as-built and site information, and this would be roughly equivalent to an FSAR that we saw supporting the licenses and for those plants licensed between 1985 and 1990.

With regard to material available for audit, it's information normally contained in procurement, construction and installation specifications. In SECY 90-377, we propose that applicants develop this third body of information, the material available for audit, sufficient to support audits of all safety-significant design features to a depth commensurate with their safety significance.

This is not necessarily what's feasible and practical. Particularly when you get out into the Turbine Island, we see that there will be a graded approach. There has been a lot of confusion surrounding this feasible and practical standard.

Again, it will be a graded approach based on safety. The staff is only going to audit a portion of the material that's developed, and out of that information we audit, we envision only a subset of that material will be necessary to support the safety decision.

If that information is needed to support the safety decision, it will be brought forward and included in the application. Audits will supplement the staff's review in two ways. First, audits will allow the staff to ensure that the design details included in Tier I and Tier II have been properly translated into the remainder of the design.

Second, the audits will allow the staff to develop a better understanding of specific design features. Again, audits and information obtained during the audits, if we need it to support our safety judgment, it will be included in the application.

[Slide.]

MR. VIRGILIO: When viewed collectively, these three bodies of information will provide the level of detail shown on this slide. You'll exceed Level II; you'll have greater than Level II, a higher degree of standardization for those certain nuclear island features like the reactor vessel and major components in the primary system.

You will see Level II for key nuclear island features, ECCS and essential support systems. You'll see Level II for key turbine island features, turbine control system, for example. At the certification phase, what we envision is Level IV for the site-specific features and that information necessary to bring that up to Level II will be developed in time to support the combined operating license hearings.

[Slide.]

MR. VIRGILIO: Switching from design detail to flexibility, the information that's certified and in the design can only be changed through the methods I've delineated here. Key elements of the design will be certified through the rulemaking process and cannot be changed without prior NRC approval.

[Slide.]

MR. VIRGILIO: Again, with flexibility -- and now I want to what's in the application and not certified, what we call the Tier II information -- because Tier II forms the basis for the finding that the more general features described in Tier I provide adequate safety and also the basis for the issues resolved through the certification process, the staff is proposing conditions to govern changes to the non-certified portions of the design.

These control change at various key milestones in the process. Between the design certification and the COL, the Tier II material will be controlled in the same manner as the Tier I material It's going to require prior NRC staff approval.

Between the COL and authorization to operate, what we envision is incorporation into the COL, provisions paralleling those of Section 5059 of the Commission's regulations. Following the authorization to operate, we will rely on 5059.

MR. CARROLL: Marty, why is it a given that 5059 shouldn't apply to the first category? 5059 requires that the licensee or whatever he is in this case, keep track of all the changes he made and periodically send those to the NRC.

Wouldn't that provide better flexibility if that approach were used?

MR. VIRGILIO: For the material that is certified? I guess I'm just trying to understand which tier of information at which point in time?

MR. KERR: Tier II.

MR. CARROLL: I'm talking about the first star.

MR. VIRGILIO: Okay, between certification and COL.

MR. CARROLL: Why couldn't I use a 5059 approach there, rather than a --

MR. VIRGILIO: Good question. The reason we're proposing this is because Tier II will also reflect issues that are resolved. Going back to what I said earlier, in order to preserve the two principal objectives of Part 52; one, for early resolution of issues and; two, to promote standardization, we are proposing that that strict set of controls apply during that window.

If we would allow 5059 to apply, what we would do would be inviting more opportunity for re-litigation of issues that were resolved during the licensing process.

MR. CARROLL: That's true, but it seems to me that the vendor -- and that would inhibit the vendor from making capricious changes, but if there was some good reason to make a change, 5059 would be a lot easier vehicle by which to do it than rulemaking, exemption or waiver.

MR. VIRGILIO: We've discussed this with industry and at this point in time, they believe that they can construct the plant and accommodate changes to advances in technology, even with this process. They believe the majority of the changes will come in after -- between the COL and the authorization to operate -- during the construction phase and later, during the operations phase.

They don't envision, and neither do we, considering what we're proposing to certify, having to go back to that first bullet much at all.

MR. CARROLL: All right.

MR. WYLIE: I don't really think you answered the question why you couldn't do that. And why we want to, I guess. I know why to, for standardization.

MR. VIRGILIO: Well, and also for final resolution of issues. If we allow a lot of changes --

MR. WYLIE: Well, aren't you going to have that problem when you for your COL? You're going to have to have your hearings at that time anyhow.

MR. VIRGILIO: After the COL and before we grant the authorization to operate and go back to Part 52.103 where the Commission now makes a finding that it's acceptable for operation, someone can still bring forward concerns.

But the window is narrowed right now as 52.103 is written. You have to provide a case that the ITAACS acceptance criteria was not satisfied. This is currently being litigated and I think -- it's hard to tell. It's too soon to tell, really, how this will all turn out.

MR. MICHELSON: I guess what we're really searching for is how you'd take care of what I might call de minimis design changes. How do we take care of all the trash without going through a rulemaking every time we've got to make some -- not an improvement, just trying to convert the 50 percent design into a 100 percent design is going to involve a lot of trash, things you haven't thought about; small problems of all sorts. And if you've got to go through rulemaking every time you run into one, it could get quite burdensome.

MR. VIRGILIO: We anticipate most of those changes to be done in a third tier.

MR. MICHELSON: Well, it depends on how much you put in tier 2.

MR. VIRGILIO: No, I don't think there's been much argument about that. Tier 2 is the application, and it's consistent with what we've used for licensing of the reactors.

MR. MICHELSON: When you say, not what is in tier 2 but the scope of what you mean to be in tier 2. You know, these words can be interpreted in many ways, including even such things as layout drawings. I can give you all degrees of layout drawings.

MR. VIRGILIO: Tier 2 is governed by standard format and content and I believe we have an awful lot of experience in implementing what should be in an application.

I think where the gray zone is, is what's in tier 1. And that'll be something that will be, you know, projected in the Reg. guide and probably decided in its final form through the licensing process.

MR. MICHELSON: I don't think we've had much experience in what should be in an application for certification since we're only looking at the first one now in great detail, at least.

MR. VIRGILIO: If we envision the application to look like an FSAR in the 1985 to 1990 time frame --

MR. MICHELSON: If an FSAR of that variety is all you need to know to make sure that a plant on paper is safe, then that's fine.

MR. VIRGILIO: But there you've asked a different question.

MR. MICHELSON: I don't think so.

MR. CARROLL: What you're saying about this window in the first star here is that you really don't think --

MR. VIRGILIO: We don't think many changes will be made in that body of information during that period of time.

We envision that more changes during that period of time --

MR. CARROLL: Suppose somebody could convince you that there might be a lot of changes. What would be the practical problems for the Commission if a 50.59 approach was used?

MR. VIRGILIO: What it would introduce is more opportunity for re-litigation. That's the practical opportunity implications to all of us -- not only the Commission but to the applicant who's looking for stability in the process. And it also will impact the degree of standardization.

MR. WARD: Well, in fact, you're trying to assure there won't be many changes made in that period.

MR. CARROLL: There is no tier 2 in that period. For this purpose, tier 1 and tier 2 are synonymous.

MR. VIRGILIO: Yes, you're right.

Let's go on to the third body of information. That material that's available for audit.

[Slide.]

MR. VIRGILIO: For those features that prevent or mitigate the consequences of postulated accidents, 10 C.F.R. Part 50 Appendix B will be controlling. In addition, applicants for design certification for that third body of information, the material available for audit, will have to comply with the provisions of tier 1 and tier 2 or go through the change processes associated with those tiers. And the cost of redesign will, to some extent, preserve standardization.

Further, we understand that industry has a number of initiatives underway. Programs have been outlined in the Nuclear Power Oversight Committee's strategic plan. None of the details have been presented to the staff so it's too soon to tell how well these programs will, in fact, control standardization.

[Slide.]

MR. VIRGILIO: In summary, we're recommending to the Commission that they agree with our graded approach to design finality, the content of the application and certification in the change process. And they authorize the development of a reg. guide that will outline in more detail what will be included in tier 1 and the change programs.

I would like to, just in final, make sure we're clear on a couple things because there's been an awful lot of confusion surrounding interpretations of the Commission paper. e staff is proposing that key features of the design be developed systematically to support audits on all key structure systems and components to commence the level with their safety significance.

This is the graded approach by the staff, and this is much different than the maximum degree of detail that is feasible and practical to achieve, particularly in the lesser safety-significant systems in the turbine island.

MR. CARROLL: Now, how did all this come about? Refresh my memory. Where did you use the terminology "maximum practical'' and "feasible''?

MR. VIRGILIO: In responding to the seven questions that were asked by the Commission, if you look at the first question -- and it starts somewhere around page 3 and continues to page 4 and 5 of the SEC'Y paper -- you'll see that the Commission asked us to tell them about the limits that would be established by the standards of what is feasible and practical.

And you go on to questions 2 and 3 that were asked of the staff and you see that there's a different approach being proposed by the staff than that feasible and practical standard.

MR. SIESS: What is the definition of practical? Feasible, I assume, is possible. Is that?

MR. VIRGILIO: And usable, I think, is a good definition for practical; is it useful? Is it feasible; is it technical achievable and practical? Is it useful?

MR. SIESS: Not only useful; can it be done with costs that can be --

MR. VIRGILIO: That has some consideration.

MR. CARROLL: So what you're saying, Marty, is in

377 the only place the staff talks about it is in responding to a Commission question. You are not in any way using the feasible or practical standard in what you're recommending.

MR. VIRGILIO: That's correct. Let me make sure, I make sure it's clear. When you get to key safety systems -- and ECCS systems are really a good example -- what we're asking to be developed comes pretty near that feasible and practical limit that we've established and delineated in Appendix A. When you get out into the turbine island, we don't need near that much information for systems that have no impact on safety, systems that could fail or malfunction and not introduce a transient.

MR. MICHELSON: How does feasible and practical relate to maximum technically achievable?

MR. VIRGILIO: That's the key, that's the column.

MR. MICHELSON: How do those first two terms or how does the first term relate to this term, because you said you didn't use it but yet you appear to be using it in Appendix B.

MR. VIRGILIO: In the tables we did we started out and the tables were produced to answer the Commission's question.

MR. MICHELSON: Yes.

MR. VIRGILIO: You have to recognize that. We developed those tables to determine the ceiling -- what is feasible and practical, not the floor -- what is the minimum we need to make our safety judgments.

MR. MICHELSON: But maximum technically achievable means what is feasible and practical?

MR. VIRGILIO: Yes.

MR. MICHELSON: Why did you change the term? Why didn't you just use the same term unless it means something else?

MR. WYLIE: Let me ask a question there though. You say that the tables do not represent what you require?

MR. VIRGILIO: If you look at page I think it's 18 when we get into the recommendations, we recognize that the table will serve as a valuable input to developing the graded approach to safety. I said earlier in some of --

MR. WYLIE: What does it mean when you've got an X in Tier 1?

MR. VIRGILIO: That's our proposal that that information be part of what is certified.

MR. WYLIE: That's what I thought but the rest of it doesn't? The rest of it does not have to be in Category 2 for example?

MR. VIRGILIO: Well, the rest of it is what we at a first cut believe will be part of Category 2 and this third body of information -- for Tier 2, I'm sorry.

MR. WYLIE: Then that is information you want developed then.

MR. VIRGILIO: It represents what was maximally, yes -- it represents our first cut. What we are proposing is that this first cut be used as input to the Reg Guide that will be used -- that will define this graded approach.

MR. WYLIE: So in effect it is defining what you expect to be generated.

MR. VIRGILIO: For key safety systems I would say yes.

MR. WYLIE: Well, of course there's a lot of things in here that are not key safety systems.

MR. VIRGILIO: And that's where you're going to see the real graded approach come into effect, particularly in the turbine island.

MR. WYLIE: How do we know --

MR. VIRGILIO: When we're talking about the nuclear island and the balance of nuclear island, we're pretty close.

MR. GRIMES: Marty, perhaps I could add something.

MR. VIRGILIO: Brian Grimes.

MR. GRIMES: Brian Grimes, Director of Division of Reactor Inspection Safeguards, NRR.

Maybe I could just go over a little of the history of the development of the table.

We did indeed start out to determine what is the feasibl- and practical level that you could come to without involving vendor-specific information and thus getting into the procurement process or as-built information which you wouldn't get until you got to the construction phase.

We then went back and tried to think about safety rationales for how much of this could be required under a safety rationale.

There are two basic safety rationales, as Marty mentioned on an earlier slide: knowing that you have successfully implemented the design information and the second is some inherent benefits of standardization.

The Staff review process for a Part 50 process relates mainly to the first. If you put yourself in the framework of being at an operating license stage where you are about to grant the license, you've got your FSAR, which has performed the basis for your litigation, if any, and the SER which documents the Staff review.

Then also you've got the physical plant, which you've walked through to one degree or another depending on your concern for safety and you have the design details which you have audited at that time, so all those things together come together and you grant an operating license.

Now what we are trying to do here is decide to what degree do we have to have that same design information to support those safety judgments which are in summary reflected in the FSAR and SER.

For the island, nuclear island, balance of nuclear island, we think it is pretty close. The tables are pretty close to what you would expect to require in a Part 50 process.

For the turbine island we think if you put a very high value on standardization the X marks indicate the most you would ever want. If you don't put a great deal of value on standardization we think perhaps you could fall back more toward the conceptual design for the turbine island, so there is an area that will have to be worked through on a system by system basis as indicated in the paper.

During the Regulatory Guide development process we would expect a good deal of iteration with the industry on what is appropriate and what do we gain by specifying a high level of detail.

MR. CARROLL: Okay, so these tables or the table is going to be used for the -- is sort of a roadmap to what you are going to put in the Reg Guide?

MR. GRIMES: Right.

MR. CARROLL: But it also serves the purpose of answering the question about what is feasible and practical?

MR. GRIMES: Right. We definitely wanted to --

MR. CARROLL: What else does it do?

MR. GRIMES: Well, we wanted to make the point that it was not feasible to get into such a great level of detail that you would get into the procurement process and vendor-specific items.

MR. CARROLL: When I take a particular line in here and I find an X under completed design certification -- okay, that's fair, and I find a parallel X under Maximum Technically Achievable, does that mean that you envision that they need to provide the maximum technically achievable amount of information short of actual vendor information?

MR. GRIMES: Yes. With the caveat I had on the turbine island, that we might back off in that area particularly. Gene Imbro has --

MR. MICHELSON: Well, I think though understanding the X -- I had the same difficulty. You can read this thing two different ways and I thought that the explanation is helpful because that was one way you could read it. There is also another way you can read it.

MR. CARROLL: Then an X under Tier 1 means that you see this as a --

MR. IMBRO: An X in Tier 1 would mean that's part of the certified design.

MR. GRIMES: Also the material available for audit would not be part of Tier 1 but it would be reflected in the FSAR.

MR. CARROLL: So we have a situation where I have an X under Completed Design Certification, an X under Maximum Technically Achievable but NO X under Tier 1 and I am to conclude that that means that you are asking for that amount of information but in the name of standardization rather than in the name of --

MR. IMBRO: It could fall in either Tier 2 or in the information available for audit.

MR. MICHELSON: Do you know which?

MR. GRIMES: We can go through standard review plans.

MR. MICHELSON: No, but I mean --

MR. GRIMES: -- but standard review plan would control what is in Tier 2 and what therefore is reflected in the SSAR.

MR. MICHELSON: But I don't know it from this table, I guess, you see.

MR. GRIMES: No, that's true.

MR. MICHELSON: When there is no X in Tier 1 column, then I am not sure whether it might be Tier 2 or Other.

MR. GRIMES: Exactly.

MR. MICHELSON: Was there some reason why you didn't want to tell us it was Tier 2?

MR. IMBRO: We just didn't cut it that fine.

MR. MICHELSON: It makes an enormous difference, though, in terms of how much detail you are expecting to be tied into the finality process as opposed to what is not.

MR. GRIMES: What we tried to get across there was the concept that it would be equivalent to an FSAR level of detail and would be determined by the standard review plan.

MR. MICHELSON: One other point -- you also said if we needed it for making a safety determination it came in as Tier 2 and some of this may --

MR. GRIMES: Yes. That is essentially what would be the question and answers during the review would have to be reflected in the SSAR or if we found something in the audit process that needed to be firmed up and made a commitment, then it would have to be reflected in the SSAR.

MR. MICHELSON: So right now we really are not sure what the content of an application for certification might be, other than I know what you think is going to be in there for sure, namely Tier 1, but I am not sure how much more than Tier 1.

MR. GRIMES: No, I think you are sure, in even more detail than this table, which is the standard review plan.

MR. IMBRO: I think we envisioned that the application is going to look essentially the same as has been submitted for recent NTOLs.

MR. MICHELSON: Well, you clearly, of course, --

MR. CARROLL: Another variation of X's is one in the middle column, maximum technically achievable.

MR. IMBRO: That's a case where we felt that although it was -- you could complete that information with possibly some bounding assumptions, that spending the extra engineering effort wasn't really commensurate with the payback in safety.

It wasn't necessary for the staff to make a safety judgment or it didn't enhance safety benefits that you can get from standardization.

MR. CARROLL: Why do I need to do the maximum technically?

MR. IMBRO: You don't have to do that. That was just setting the upper bounds and if you did want to expend that money, you could to maximum technically achievable. We felt that, however, for those specific examples, that it wasn't worth the effort to do that at the stage of design completion.

MR. CARROLL: The one I'm looking at is non-Class I-E, 120 volt DC distribution drawings.

MR. IMBRO: Yes, and a lot of that's pretty low tier information. From a safety point of view, you really don't -- se really won't have much of an impact.

MR. MICHELSON: You don't think it's needed for design certification?

MR. IMBRO: No, not non-I-E.

MR. MICHELSON: I was looking at the I-E under single line on page 9, B-1-9, the 120 volt AC distribution system. There is no X in the column under completed design certification, for instance. I kind of wondered why there was no X there.

MR. VIRGILIO: I don't think we're ready to defend those tables to that level of detail.

MR. MICHELSON: I didn't mean to, but I'm having a problem understanding the tables. I think I'm getting closer, but this answer I just heard on maximum technically achievable sounded different than the answer I heard a few minutes ago, I thought.

What does it mean if there's an X in the maximum technically achievable table?

MR. CARROLL: And nowhere else.

MR. MICHELSON: And nowhere else?

MR. IMBRO: It means that from our experience, we felt that that type of information could be provided at the time of design certification without vendor information, without as-built information.

MR. MICHELSON: Does it mean then that you expect it to exist at that point?

MR. IMBRO: Only if it has an X on it.

MR. MICHELSON: You're saying it's possible?

MR. IMBRO: It's possible. If it has an X in the completed design certification column, that means not only is it possible, but we expect it to exist, as well.

MR. MICHELSON: Okay, well, if I see an X in both of those columns, that means that not alone do you do everything that you can at that point, but you expect it to be done?

MR. IMBRO: Right.

MR. MICHELSON: As opposed to the other case where, yes, you could do it, but we don't expect it?

MR. IMBRO: Exactly.

MR. CARROLL: I don't think that heading conveys the meaning.

MR. MICHELSON: I think it's the third way I could read this now.

MR. SIESS: I have been listening to this and I don't think that any of you know what it means.

MR. MICHELSON: That's right.

MR. SIESS: We ought to designate somebody on this committee that knows what it means. I'd like to think there's somebody I could go to tomorrow and say, what does it mean?

MR. MICHELSON: It's a third way of reading it, I guess. Why don't you proceed.

MR. VIRGILIO: Let me move on and clarify one other point that seems to be a source of confusion among a couple who have read the SECY paper and that is; what's resolved? There's been much discussion about issue finality.

There has been some confusion with regard to whether we intended that the only issues that be resolved be those issues included in Tier I, the material that's certified. That is not the staff's intent.

The staff's intent is that the SER will address those issues that are resolved and from this vantage point, it's our anticipation that all of the information included in the SSSAR will be resolved. The SER will endorse the SSAR, just like the SERs during the Part 50 licensing process endorse the FSAR and said, we find this acceptable, based on this submittal.

If there are pieces of that submittal that we do not want to grant issue finality to, we would call it out in the SER. It's not just Tier I that we're targeting for issue finality; it's both tiers of information.

MR. CARROLL: Well, you've got to make a finding that the whole variant is acceptable if you're going to certify the design; don't you?

MR. VIRGILIO: That's about --

MR. CARROLL: There can't be any outstanding issues.

MR. VIRGILIO: Certainly, there can't be any outstanding issues, and there really isn't any point to the discussion in the rule on issue finality if it's only that that's embodied in the rule itself. Of course, that's final. It's locked in and it's solidified.

MR. SIESS: I am having a problem in making a distinction in -- really making a connection between the design and the plant, whether it's the first plant, the second plant, the third plant, et cetera. You want finality in the design.

Does that mean finality in the plants built? Whatever you resolve with words in the design will still be resolved when the thing is built and you can go look at it?

MR. VIRGILIO: Yes.

MR. SIESS: You think they can write the words down and you can write the words down that will assure that?

MR. IMBRO: I think that's one of the reasons why we're asking to have the third body of information developed, the so-called information for audit.

MR. SIESS: I wasn't down at that level.

MR. IMBRO: Maybe you could restate your question.

MR. SIESS: Well, I can't state it any differently. You keep talking about the design as if that defines what's going to be physically out there and operating.

I don't see any way it can for the first plant. General Electric and Westinghouse both say they can't do it. They can't afford to give you that kind of a design for one plant. That's what I just read.

MR. VIRGILIO: The solution is to go back to what we proposed to the Commission in April, and that is to make our ad hoc decisions. That doesn't further here's standardization.

MR. SIESS: Is it your job to further standardization; is that your point? Does the staff feel that that's part of their mandate from the Congress, to further standardization?

MR. VIRGILIO: If I look at the rule and I look at the statements and considerations and I look at the SRMs that we received from the Commission, we've been asked to consider not only what we need to make our safety judgment, but also consider what we need to further standardization.

There's an alternative, and that's to go back to just the level of detail we need to make our safety judgments.

MR. SIESS: Now, if I read correctly the two letters I've just read from General Electric and Westinghouse, I would think that what you have proposed in the SECY does not further standardization because they say, we just can't do it.

Now, is that furthering standardization? Maybe it's furthering safety because there won't be any more nuclear plants built.

MR. VIRGILIO: Well, maybe they said they can't do it because they didn't quite understand the paper.

MR. SIESS: Well, if they can't understand something that you guys have been working on this long, what makes you think they're going to understand your approval of the plant?

MR. IMBRO: When we put together the attachment or appendix we felt that the things there in Attachment B could be achieved.

We didn't think, based on our experience, having worked in industry and on the experience of consultants we retained who also had industrial experience, plus we talked to several AEs, we felt that those things were not unachievable.

MR. SIESS: So, all of your experience and judgment and consultants tell you that GE and Westinghouse ought to be able to go ahead and do it the way you say?

MR. IMBRO: We feel that they can do it, at least to the level we desire.

MR. SIESS: And their saying they're not doing it is just simply trying to put pressure on you?

MR. GRIMES: No. I think they have a valid point, in that it requires additional up front money to do this. That is a clear and valid concern, and the difference between the staff recommendation and the industry recommendation as to how this process should proceed.

MR. SIESS: If you're making it too expensive for them, is that furthering standardization?

MR. GRIMES: Well --

MR. SIESS: I can understanding your requiring things to further safety, and that that may or may not make it too expensive. You know. We don't care. If they can't do it safely they shouldn't do it.

But you say your objective, the Commission has told you, is to further standardization. Now if some of the things you've proposed are not needed for safety but are needed in your mind to further standardization, are you sure that they're accomplishing it?

MR. VIGILIO: You have gone right to the heart of the policy question that's before the Commission as they review this paper. I don't know what else to tell you.

MR. GRIMES: I think, if I could phrase it, the Commission, I think, has to decide what safety benefits they see in standardization and how much emphasis, therefore, to put on the standardization of these plants.

If there is little safety benefit in standardization, then probably what we've described for the

Nuclear Island, the balance of Nuclear Island, is what the staff by an iterative process would get to anyway.

MR. CARROLL: For safety reasons.

MR. GRIMES: For safety reasons. If the Commission puts a high value on standardization, then also the Turbine Island details would have to be run up.

Now the industry may be underestimating what it's going to take to get through the iterative process. So the delta may not be as big as indicated.

MR. KERR: Mr. Chairman?

MR. MICHELSON: Yes?

MR. KERR: I'm becoming a confused by-stander. I had thought that the Commission originally decided that standardization would enhance safety. I did not realize that they were interested in standardization because standardization itself had some merit. Am I mistaken?

MR. GRIMES: Well, that's just what I stated. That, to the degree that standardization has safety benefit, you have to decide on that basis how much standardization to go for.

MR. KERR: Yes. But I see now what appears to be a separation on the part of the staff, where they have one set of things that are needed for safety and another set that is needed for standardization. Which says to me that there is a separation between the two.

MR. CARROLL: Well, I think what they're saying, Bill, is "traditional safety" requires address.

MR. KERR: Now wait a minute. I don't see --

MR. CARROLL: And is there an increment of safety that's gained by standardization. That's the two piles there.

MR. GRIMES: That's right.

MR. VIGILIO: Very well stated.

MR. KERR: Well, but I mean, how are you going to say that -- I mean, if existing, a list of things will enhance safety sufficiently what more does one need?

I mean, the Commission has said that it does not expect -- I think it has said -- it does not expect more plants to be required to be safer, but would rather they simply expect that they will be through the course of developments and so on. They told the staff this, I believe, recently.

MR. CARROLL: Whether they be standard plants or custom plants.

MR. KERR: Yes. So, it isn't that we're out somehow to achieve a different level of safety.

MR. IMBRO: I think if I could just say some''ing in terms of the Rule. When the Rule talks about essentially complete design, it also includes the Turbine Island. It is my understanding that the reason that the Turbine Island was included in the Rule was because that was a significant transient initiator, and felt that if some of that design was provided up front, and that includes standardized, then that would result in some safety benefit as a result.

MR. KERR: I'm not arguing that point. That may well be true.

MR. IMBRO: Yes.

MR. KERR: But that simply says to me that, in the past, that island hasn't been included because it was thought not to have safety significance. Now it is thought to have safety significance, so it's included. I have no quarrel with that.

But that doesn't tell me that you separate those things that have safety significance, which now apparently includes the Turbine Island, from those that don't have safety significance but have standardization significance. I'm lost.

MR. IMBRO: We haven't pushed standardization just for the sake of standardization alone. I think we feel, and obviously the goal of the Commission, the NRC, is the health and safety of the public.

So whenever we've tried to increase standardization we felt that there was some implied or inherent safety benefit that could be gained from that.

MR. KERR: I'm simply saying that you, yourself, have separated the two in some fashion, which must on your part be logical. And you have said in this box goes those things that are necessary to ensure safety, and in this box go those things that are not necessarily associated with safety, but will enhance standardization.

Now it seems to me that you'll want to be able to see some safety benefit to the standardization which you require. I mean, it's clear that not everything in Plant number 2 is going to be identical Plant number 1, if for no other reason that one of them will be younger than the other.

So, you can't assume the two of them to be absolutely identical. I don't think anybody ever assumed that.

Isn't there some way that you can decide which of the standardizations enhance safety and which don't?

MR. VIRGILIO: What we proposed to the Commission, if we turned the clock back to April is that we would do our reviews and have as much standardization as we would accommodate or provide through our safety reviews alone. It would be a revealed standard.

When we would be done, we would be able to look back and say that's the level of standardization that will be achieved. The Commission did not find that acceptable and directed the staff to go back and do more work. Now, this is the policy decision, again, that I think the Commission has to make as to whether they want more standardization --

MR. KERR: Have you told the Commission that you think they're making a mistake and that additional standardization won't enhance safety?

MR. VIRGILIO: Well, I --

MR. KERR: You owe it to the Commission, if that is your view, you owe it to them to tell them that.

MR. VIRGILIO: To get additional safety out of the standardization, it's a matter of how do you quantify it? It's impossible to quantify.

MR. KERR: I'm not suggesting that you quantify it, but you ought to at least be able to make some arguments to support it, quantitative or not.

MR. VIRGILIO: We did in the statements of consideration and I defend those. I think those represent the gain -- you rapidly gain operating experience. You do this much quicker than if you have a hundred different plants out there. You are able to share the information between utilities. You are able to develop a tighter link between the vendors and the utilities that receive that information, and it allows a rapid response if there's a problem on the part of industry and the NRC.

You know, there are good reasons -- there's bad reasons for standardization.

MR. SIESS: Then Dresden -- Dresden should be twice as safe as Oyster Creek.

MR. VIRGILIO: I can't quantify it. It goes back what I said earlier. You're asking me to put a number on it.

MR. KERR: No, I'm not -- I'm not asking you to put a number on it, I'm asking you not to set up 2 columns of things, one of which is associated with safety and one of which is associated just with standardization.

MR. MICHELSON: He hasn't done that, has he?

MR. VIRGILIO: I can't do that. It's a revealed standard. At the end, I'll be able to look back and say that's how much standardization you've got.

MR. KERR: Well, that says benefits of standardization.

MR. IMBRO: That's something that -- that I put together to try and, I guess, show in a -- in a qualitative way, what they think could be the benefits of increased standardization.

MR. MICHELSON: Before you get into that -- I sympathize with Bill's concern and I have had a similar one. It's difficult for me to look at any particular item and decide where -- where requirements to make safety determinations end and requirements to achieve standardization pick up.

I never tell from an item, and when you ask for a certain level of detail to be completed, whether that's -- how much of that's needed for safety and how much of that is needed for the nicety of standardization.

MR. VIRGILIO: We can't either.

MR. MICHELSON: No, I know you can't, so --

MR. VIRGILIO: That's why we keep telling the Commission -- that it will be a revealed standard when we're done.

MR. MICHELSON: Yes, so -- but it becomes very difficult to make the judgment as to how much money to spend on something that nebulous.

MR. SIESS: Well, do you have to? Staff has to make a finding on something, but do you have to make a finding at that level of detail, to get a plant, that when it's build will be safe to operate?

MR. VIRGILIO: No. If I think of our findings and I go back to Part 57, you know, the traditional safety findings in the OL licensing process, it doesn't include standardization and I don't believe that our findings to support the COL will also include a separate standardization finding.

Our safety findings are going to be based on what we need to support safety.

MR. SIESS: Suppose I build one plant and come in and want to replicate it and you prove that plant, it may not be the best think I could make, but I built it and operated it, and I want to replicate it. Will replication improve safety simply because I have a lot of them?

MR. VIRGILIO: I think you can make an argument that the SNUPPS plant and Palo Verde -- yes, in fact, you've got the safety benefits of standardization in those designs today, and we've discussed that in our Commission paper.

MR. SIESS: Are the safety benefits standardization of replication?

MR. VIRGILIO: The standardization you achieve from the replication process. What you've gained in replication is, is the economies of design and construction.

MR. SIESS: Okay. Now a few minutes ago you said the Commission rejected your original proposal. When I read that, I thought they were saying, go back and see if -- if that's really all you need or could you do more? Did they really say, don't do it that way, come back with more?

MR. VIRGILIO: If -- if I look at what the SRM directed us to do. You know, that was the direction we got from Commission. We've got several SRMs for you to review that include those in June, July and August that direct the staff to go back in and look at it again, and provide specific answers to specific questions.

MR. SIESS: Okay.

MR. MICHELSON: Well, let me try to comment one more time. I think the -- the difficulty many people are having with this whole process is it appears, to varying degrees, to be asking for information far beyond that required to make a safety determination.

Everybody agrees you have to have what it takes to make the safety determination. The only thing we don't all agree on is how much further than that one should go. Somehow, we've got to be able to get some feel for where you've gone too far and where you -- maybe you're about right and so forth. How do I get that feel when I don't even know what you need to make the safety determination? I don't have the Reg Guide to read.

MR. GRIMES: The process that we're recommending here for doing just that is development of the Regulatory Guide, which would --

MR. MICHELSON: Yes. But in the meantime, of course --

MR. GRIMES: -- require interaction with the industry on these specific points.

MR. MICHELSON: In the meantime, you have to finish up on ABWR without that Regulatory Guide, unless you weighed --

MR. GRIMES: I think it can be done in parallel.

MR. MICHELSON: Yes.

MR. VIRGILIO: Why don't I let Gene go through and answer whatever other questions you might have on this?

MR. SIESS: If we're not going to have standardization, I don't know why we're going to worry about it. I think the questions that have been asked relate to whether or not there are going to be standard designs. Because NRC's not going to make standard designs.

Maybe that will be the answer. Let the staff design the plant. Is that radical?

MR. CARROLL: That can be done in California.

MR. MICHELSON: Not in your backyard?

[Slide.]

MR. IMBRO: My name is Gene Imbro. I'm with the Office of Nuclear Reactor Regulation, Division of Reactor Inspection and Safeguards.

I guess I'm here to answer the balance of the questions, hopefully.

What I would like to do, really, is to, since we played a large role in the preparation of the attachment, is to try and go through that in a little bit of detail to maybe provide you with some additional insights and maybe some explanations. And I'd like to try to answer any of the questions you might have.

When we started out, what we tried to do first was split the systems up into different categories, with kind of some perceived notion of safety significance. And we came up with four different categories. You'll see the next two on the next slide.

But just for this slide, particularly, we came up with, as the systems we thought most safety significant, we put in the category that we termed "nuclear island." And those would be primary coolant system, and the like up there.

These basically we felt were systems that, if they failed, would require some type of protective action, or form primary barriers, such as reactor containment.

Going down through the hierarchy of safety significance, we coined another term, another category, which we called "balance of nuclear island." And in the balance of nuclear island, we put mostly the accident mitigation systems, and their support systems, as you can see listed here.

[Slide.]

MR. IMBRO: And two additional categories. The turbine island, which is typical of systems you see in a turbine island. And also, the last category was site specifics. And those things were things that were not possible to know at the time of design certification, because you wouldn't have picked the site. And those would be things like the ultimate heat sink, the circulating water system, et cetera.

As we discussed last time, I think that the essential service-water system is probably an example of a system that almost needs to be in two places. Part of it needs to be in the balance of nuclear island, for the simple reason that you, since you know the building configuration, you know what requires cooling water, you would need to know some additional detail on the essential service-water system as it goes through the aux. building and possibly into the reactor containment.

But for the portion of the service-water system that's in the yard or in the intake structure, obviously you wouldn't have that type of information available.

[Slide.]

MR. IMBRO: In trying to answer the questions from the SRM, one of the questions I guess I can paraphrase is in SRM Item 2 that I guess appears on Page, the first few pages of the Commission paper, the SECY.

The question was, and I'll paraphrase: why standardization can't be achieved without going to Level-1 detail. And if you kind of ignore these levels for a minute, and just kind of focus on the "S" curve here, what we tried to show by this, by this curve, and we developed it pretty much based on our own experience, and it seems to intuitively be correct, although it clearly has a band of error around it, that as proceed on with any job, you start out with kind of a point where you [illegible] expended a lot of engineering and certainly have a lot of flexibility to change the design.

As you increasingly develop the design, you kind of get to a point where there's kind of a knee-up here, where you've gone so far that you're pretty much locked in the design, for all intents and purposes, although there is still a large portion of the design that remains to be done in the details. But this portion of the design doesn't really significantly affect standardization.

Going back, as we talked about before, on the different levels, we felt that the nuclear island should be, at least parts of the nuclear island, we would need to know to greater than Level 2, and so that we would need a fair amount of detail to be able to make our safety judgments. And the nuclear island then would be somewheres up in here.

For the balance of nuclear island, and the turbine island, we felt that, well, for the balance of nuclear island, we felt that Level 2 is probably necessary to be able to make safety judgments.

For the turbine island, we also included that as kind of a Level 2 system, but I think for the turbine island, Level 2 defines the outer bounds of the types of information we would expect.

We, clearly, as was pointed out before, we don't really think that everything in the turbine island needs to be Level 2. Perhaps those systems that could be transient initiators, or a turbine control system, as Marty said, may need to be Level 2. Clearly, systems like floor drains in the turbine building, you probably wouldn't care a whole lot about.

Proceeding down to site specifics, we felt that those could be developed to kind of Level 4, which was sort of a conceptual design phase, where, pretty much, they were very dependent on site specifics. The most you could do is a conceptual design and provide interface information so that where they communicate with the other systems in the balance of nuclear island and the nuclear island, you would have at least the criteria specified.

You can flip over.

MR. MICHELSON: Now, I guess you still agree with the clarification that we solicited at the subcommittee meeting, that these site-specific features are those in the yard and out at the heat sink, not those in the building, because essential service water has to flow in the reactor building and so forth.

MR. IMBRO: Yes, I agree with that clarification. That was a good point.

MR. MICHELSON: And you're not changing your opinion on that?

MR. IMBRO: No.

MR. MICHELSON: Okay.

MR. IMBRO: Not at all. Not at all.

MR. MICHELSON: It's well to emphasize to people that we really mean the essential service-water system is detailed inside the buildings.

MR. IMBRO: Yes.

MR. MICHELSON: It's just not detailed out in the yard --

MR. IMBRO: Right.

MR. MICHELSON: -- or at the structure.

MR. IMBRO: That's a good point.

In going to the next slide, it's kind of a preamble to the tables. What we tried, again with the same kind of S curve, we felt that conceptual design, as I said, is pretty much the basics, and then, as you develop the design further, you get up into what we call a preliminary design phase. The kind of demarcations between here are kind of fuzzy, but we drew them as lines in any case.

The detailed information, then, is the -- developing the detailed design is the time when you're really kind of finalizing design up to the point of writing specs. By the time you're done with the detailed design phase, we estimate you would have completed roughly about 50 percent of the engineering, and would have achieved a reasonably high design finality, principally because, at this point, you would basically have sufficient engineering information to prepare most of the purchase specifications. So you wouldn't really need to do a lot more of additional engineering to then complete the design. So once you get to this point, you've expended a large number of engineering hours and money, and have had the design reasonably well finalized.

So we're proposing, kind of on an integrated basis, that Level II would be the point generally that people would reach at the time of design certification, although, as I pointed out before, it would vary from Nuclear Island down to site specifics.

MR. MICHELSON: A question which we asked at subcommittee, which I'm not sure you're going to clarify because this might not be the place to do it. In the process of satisfying standard review plan requirements, a potential licensee has to submit a number of hazards analyses, hazards associated with flooding and with fire and with pipe breaks and seismic disturbances, and so forth.

It isn't clear, nor does it show up in the tables -- in fact, it does show up in the tables as not being even submitted for design certification -- it's not clear to me

how those studies enter into this picture. Are you saying
they don't have to be completed until later, or what?

MR. IMBRO: As far as I recollect, I think those needed to be completed at the time of the plant certification.

MR. MICHELSON: Of course, I guess I'm quibbling with the details of the table because there was no X mark. It was all in the detail design phase.

I was referring particularly to page B-1-51, which deals with engineering mechanics in a detailed stage, and it says, "Hazard analyses from missiles, pipe whip and line breaks," and there's no X for completion of design certification. Certainly, you're going to have to know something about those subjects to specify equipment qualifications.

MR. IMBRO: I agree.

MR. MICHELSON: Okay.

MR. IMBRO: The tables are somewhat confusing. I think, at that point, we felt that --

MR. MICHELSON: But certain of the analyses of that sort -- clearly, those required by standard review plan will be somewhere up before certification?

MR. IMBRO: Yes. The thing is, as we discussed last time in the subcommittee meeting, we didn't really anticipate that all the piping would be run. So you wouldn't be able to complete the hazards analysis --

MR. MICHELSON: Clearly, it's going to be a difficult thing to do totally, but there seems to be no thought-through plan, at least, as to how you will handle the problem of how much do you do before certification, how much do you do after?

MR. IMBRO: Look at page 1-39, the first item is Hazardous Analysis and Calculations. In there, we --

MR. MICHELSON: Yes, this is for the mechanical design.

MR. IMBRO: The mechanical design, right. We say that -- of course, all the hazardous analysis are really tied together. You can't really split them out by discipline.

MR. MICHELSON: Well, they are split out by discipline.

MR. IMBRO: You're right.

MR. MICHELSON: In some places, they're X, some places they weren't. But that is the intent, though, is that right?

MR. IMBRO: Yes. Yes. Clearly, we felt that the design, especially when you get to the 50 percent part of the design, you should have enough information that you could complete a reasonable detailed hazardous analysis.

MR. MICHELSON: Well, for the benefit of the

Committee, could you tell me what degree of information you think must be available in the EQ area, because the Part 52 seems to talk about that required to write a spec, and so forth. Well, to write a spec for a component, I got to know enough about EQ to write the spec.

MR. IMBRO: I think that for the EQ area, you know, we basically specified that general arrangements need to be done. We specified that high-energy piping at least greater than two-and-a-half inches needed to be routed, and we had specified that preliminary piping analyses needed to be done so you'd identify high stress points and potential break locations.

From that, and knowing the process conditions, which I believe also are required to be completed before design certification, you could know the mass energy release into the room. So you'd be able to do some kind of a bounding area study so that you could put an envelope around pressure, temperature, humidity, radiation type of thing, and then those could be specified in Tier I, if you like.

MR. MICHELSON: Because they become final, as I understand it, at the time of certification.

MR. IMBRO: That's right.

MR. MICHELSON: And I'd like to be comfortable that you've picked the right level of environment and so forth.

MR. IMBRO: Yes.

MR. MICHELSON: To do that, I've got to know a fair amount of detail. This is not just pipe breaks, of course; it is other things as well, such as fire.

MR. IMBRO: I think the intent was that there would be enough detail either submitted with the application or available for audit that you'd be able to know. At least you would be able to bound what the environmental conditions or the hazards would be in a room.

So the intent clearly was to have a hazardous analysis if not totally completed because you didn't run all the small bore piping, at least to a degree that you could feel sufficiently comfortable with it.

MR. MICHELSON: Now you're beginning to deviate from a clear answer of, Yes, it'll be available for certification, and that's my problem. I think a lot of it can't be done until later, but there's no plan on how much you would need to be comfortable in certifying, and how you'd be satisfied to turn over to an ITAAC or something else to find out.

MR. IMBRO: Well, you know, again, I guess it's kind of a -- maybe it's a perception or an individual judgment, I suppose. I feel that, you know, with routing of the high-energy line pipe specified up front, routing of the major service water lines, and plus, you know, a controlled process in place, we clea' · expect that -- well, we basically said in this p ·r that we think that the design criteria should be Tier 1 documents. So --

MR. MICHELSON: I think all those things could be said of present day plants, and look at all the problems we've had with EQ and rework of EQ and so forth, trying to --

MR. IMBRO: That's true, and I agree. The alternative is then you go to 100 percent design completion, and I think even we don't think that's reasonable.

MR. MICHELSON: No. That's why I say the plan is needed. I don't find the plan.

MR. IMBRO: Okay. All right.

MR. WYLIE: Well, maybe you can help me. I couldn't tell how you implement equipment qualification from looking through that. What is the plan to do that?

MR. IMBRO: I can't really speak of the mechanics, but I think we did say that they needed to have an EQ environmental qualification plan submitted as a part of Tier I so that they would specify at design certification --

MR. WYLIE: Can you tell me where that is? I don't remember finding that.

MR. MICHELSON: The plan, I think, perhaps is -- I mean, clearly, you have to have a Part of Tier 1 in that plan.

MR. IMBRO: That's up to the staff review and the staff guidelines. I can't tell you the mechanics of it. I'm not a specialist in EQ.

MR. WYLIE: That would be a plan, but what is it? To use an ITAAC to follow up on that after its certification?

MR. IMBRO: Yes, you could. That would be a way to do it.

MR. WYLIE: I mean, is that what your plan is?

MR. IMBRO: I think you could do that. I think you could do it with an ITAAC. But let me say what I think we meant. We felt that the environmental envelopes could be specified for the different areas, and that we could go in then and do audits, either as part of the ITAAC, or as part of our inspection process or audit process to verify that, in fact, the equipment placed in the room was suitable to withstand that environment. I'm not sure how much we could push into ITAACs. I think that's question that we still haven't decided yet. But clearly --

MR. WYLIE: I mean, that's what I'm saying. I couldn't determine here what your plans were.

MR. IMBRO: I mean, we haven't worked out all the mechanics and all the details yet. That's clear.

MR. SIESS: Are you hearing different things now than you heard Tuesday?

MR. IMBRO: We asked a little on Tuesday --

MR. SIESS: Didn't you meet all day Tuesday?

MR. WYLIE: Oh, yes, we did. Sure.

MR. SIESS: You can't explain it to me, and they can't explain it to you still?

MR. IMBRO: Let's try again, then.

MR. WYLIE: I guess you're right.

MR. SIESS: Well, I don't know. I'm sitting up here, and the only two people that heard it Tuesday are asking all the questions. Have the rest of us given up?

MR. MICHELSON: Well, start asking.

MR. SIESS: Well, I expected the Subcommittee to sort of tell us a little bit to begin with what they learned so we wouldn't have to --

MR. SIEGEL: If I could refer you to page B-1-18 --

MR. MICHELSON: Well, before you refer him to it, let me indicate the process. Part of the reason for asking some of these questions is, yes, I think I already know what the answer is, but you haven't heard the question or the answer. The reason for asking the question is to be sure that you're aware of the answer.

MR. SIESS: I'm getting them sort of as random questions. I haven't been able to find the pattern in here that's leading to -- presumably, the question the Commission wants us to ask is, Should they go to this level of standardization?

MR. MICHELSON: That's a very important part of EQ.

MR. SIESS: I hear a lot of questions that imply that the staff hasn't gone far enough on detail.

MR. WYLIE: No, I don't think that. I think the question on EQ, basically, was a clarification.

MR. SIEGEL: If I could refer you to page B-1-18 on EQ, halfway down the page --

MR. SIESS: That's one of the things with a lot of "X"es on it.

MR. SIEGEL: Right. Definition --

MR. SIESS: And we don't know what the "X"es mean?

MR. SIEGEL: Definition and scope of vulnerability/susceptibility requirements and methodology, EG, EQ and other items.

MR. SIESS: Just a minute.

MR. SIEGEL: It's specified as both completed design certification and as Tier 1. So that's where the methodology would be --

MR. SIESS: Yes. I'm just trying to figure why I start in the middle. What's the significance of that particular page?

MR. SIEGEL: The question was, What consideration is given to the EQ plan --

MR. SIESS: Whose question was this?

MR. WYLIE: Mine.

MR. SIESS: Oh, Charlie's. I thought you were addressing my question.

MR. WYLIE: No, he's addressing mine.

MR. SIEGEL: I'm sorry, Dr. Siess. I went back to the earlier question.

MR. WYLIE: Now, this basically is spelling out the criteria, right?

MR. SIEGEL: Yes. This is the methodology --

MR. WYLIE: But it doesn't say how you're going to handle it.

MR. SIEGEL: The plan or the methodology. The methodology is how you would handle this.

MR. WYLIE: This is defining it?

MR. SIEGEL: Right.

MR. WYLIE: I mean, it's defining it.

MR. SIEGEL: It says the applicant must define how the plan for -- the methodology for how he will design this aspect for the --

MR. WYLIE: I don't see plan in there.

MR. MICHELSON: Without looking, then, can you answer beyond the plan, which clearly this could be, depending on how one interprets it. But now, you have to convert that plan into enough details to find out what is the EQ requirement on a particular piece of equipment. Will, that EQ requirement on a particular piece of equipment be a part of Tier 2 information before certification?

MR. IMBRO: In my mind, I had envisioned, like I said before, that the design would be completed sufficiently that you could really develop envelopes, you know, process parameter envelopes for the space.

MR. MICHELSON: But there will be at the time of certification a specific understanding as to what the EQ on that particular piece of equipment must be. Is that right or not? I'm trying to get a feel for how much do you know.

MR. IMBRO: Well, pretty much, as we specified before, you would know the locations of the equipment, you know, within a room, and even to a reasonable degree where within the room the equipment would be, and --

MR. MICHELSON: Because Part 52 seems to require that you know everything you need to go out and buy the piece of equipment.

MR. IMBRO: That's right.

MR. MICHELSON: Is that correct?

MR. IMBRO: That's right.

MR. MICHELSON: And I need to know what the EQ is going to have to be on it before I can go out and buy it.

MR. IMBRO: That's right.

MR. MICHELSON: So that must be, I think --

MR. IMBRO: Only a minimal amount of engineering, if any, should be done by the time you finish with design certification.

[Slide.]

MR. IMBRO: All right. Let's, if we can, talk a little bit about the tables, which have been, I guess, a source of great confusion to a lot of people. The tables are really -- we tried to define by engineering product because we felt that it's hard to talk in generalities. So we thought we needed to get down at least to some degree to a level of specificity so that people could really understand what we were talking about.

So, on the lefthand side of the table, basically you have a list of engineering products. The fact that this says "conceptual phase" and "preliminary phase" means that these products first appear in that particular phase of design. So it means that up front, these are the first products you're going to start to see, then, as you progress through the design, you'll see preliminary phase products and detailed and final phase products.

Level II means that we would expect to have information in here completed so that you would be able to have sufficient engineering information to out and specify a component for purchase.

Let's start over here. Maximum technically achievable, as we've gone through before, basically means that that's as far as we in our engineering judgment said you could probably -- you could go without having specific vendor information or site-specific or as-built information.

So, of course, the Part 52 process stops short of being able to write or having people write purchase specs only under special conditions, where staff would specifically need that type of information.

MR. CARROLL: And I can read those words to be the same as -- what are they? --

MR. MICHELSON: Feasible and practical.

MR. IMBRO: More or less. I think that would be a reasonable interpretation.

MR. MICHELSON: From what you said earlier, just be sure, because I think it's very important, and that is if there's also an X in column 1 for that item, it then means that you expect them to have gone to the maximum extent feasible?

MR. IMBRO: That's right. Exactly.

MR. MICHELSON: As opposed to what you might need for certification or even for standardization. How far beyond standardization does one go, because -- well, I guess that's 100 percent design, then.

MR. WYLIE: Gene, would you help me with -- the lefthand column describes engineering products.

MR. IMBRO: Right.

MR. WYLIE: And, as you say early in the table, these are engineering products that appear? For example, I think the conceptual design phase.

MR. IMBRO: Right.

MR. WYLIE: But over in the heading on the whole table, there's detailed design complete, Level II. That's much later in the project.

MR. IMBRO: I think what we're trying to imply here, and I apologize for the confusion, but what we're trying to say is that at the time of design certification, you would have this completed to Level II.

MR. CARROLL: On page 39, he's gone there.

MR. WYLIE: So this is repeated, that engineering product is repeated?

MR. IMBRO: Yes. In a lot of cases, they were repeated, and we did that just for expediency.

[Slide.]

MR. IMBRO: The same mechanical design, if you go back about four pages back from that other one -- and this is page?

MR. CARROLL: 39.

MR. IMBRO: Page 39, you see that, again, there is the same layout. But over here, what I put this up for was to show that we really don't expect, at least for the balance of nuclear island, things to be completed in the final phase. What we're saying is that the final phase requires basically vendor information to finish and also as-built information to do reconciliations.

MR. MICHELSON: Why are hazards analyses at that point then?

MR. IMBRO: Here?

MR. MICHELSON: Yes.

MR. IMBRO: Okay, well, again, to clarify what I've said before and perhaps to restate it, is that the hazards analysis, we feel, cannot -- from the level of information that we have specified, we don't think that it's possible to complete a hundred percent hazards analysis.

Again, as you pointed out the last time, we haven't really prescribed the detailed routing of small bore piping. So, we feel that after sometime before the plant operates, that it's incumbent upon somebody to go out and either do an audit or do a walkdown to make sure that the things that we didn't specify up front really got addressed. Obviously, we have criteria specified in the design certification or in the application that would permit people to -- or give people the wherewithal to run piping routing so that they would be cognizant of hazards.

MR. MICHELSON: So it's sort of a two-stage hazards analysis? One is enough to be comfortable for certification and the next one will be comfortable for operation?

MR. IMBRO: Right.

MR. MICHELSON: That doesn't come through clearly, but I don't see anything wrong with that, once I understood what you planned -- how you planned on splitting up those two pieces.

MR. IMBRO: I think the intent was that, in order to really compete the hazards analysis, you really need to have a final design. You need to have something to look at.

MR. MICHELSON: You have to have something to walkdown, eventually. You can't walk down paper.

MR. IMBRO: That's right, and that's why we had this over here in the final design phase as well.

MR. MICHELSON: Its absence earlier -- or at least I couldn't -- I didn't find it. Maybe it's there, but it appeared that you were waiting until the end. In fact, you were waiting beyond certification to do a hazards analysis and that seemed to be inconsistent with a safety determination.

MR. IMBRO: No, no. Also, I could point out one thing on this one. You'll notice that it specifies details and you don't see any X's in Tier I. That's because the things we put in Tier I tended to be more things that were generically applicable across the plant like design bases and criteria, types of programmatic documents like set point methodologies, seismic and environmental qualification plans.

We put -- in fact, if you look back a few pages, probably you'll see something about -- it says P&ID simplified, Tier I. By that, we meant kind of a -- oh, you might call it a cartoon, if you will, where you have just the major piping and major components spotted, because, clearly, I think it would be unreasonable to ask people to put in Tier I, a final P&ID, because those always change, depending on vendor information.

You have P&ID in two places. This would be the P&ID that would be developed basically at the time of completion of the detailed phase.

MR. WYLIE: Dr. Siess has a question.

MR. SIESS: I have a question to the Chairman. I've been waiting for a chance to ask it and I figured that the discussion of X's is likely to go on for the next hour, so could I interrupt and ask another question about the subcommittee meeting?

MR. WYLIE: Sure.

MR. SIESS: I missed the first part of this meeting, so you may have said something. Did the subcommittee have the copies of the letters from the three vendors?

MR. WYLIE: No.

MR. SIESS: You did not. Did you have any presentations by any of the representatives?

MR. WYLIE: No. Well, we had a presentation by NUMARC.

MR. MICHELSON: Some presentation.

MR. SIESS: I've gotten the impression somewhere amidst the X's -- it would be nice if we had some O's in there -- that the utilities, the vendors just don't understand. They misunderstood what the staff said what the X's meant.

I wondered if anybody -- well, I got that impression; I may be wrong. If that is somebody's feeling, has anybody explored the difference between what the vendors think the staff is saying and what the staff thinks they're saying or what the committee thinks they're saying?

MR. CARROLL: One very good indication of what the staff thinks and what a vendor thinks is the last few pages of this document which is their comments on --

MR. SIESS: Which document, the SECY?

MR. CARROLL: -- on the ramifications of this with respect to the ABWR design.

MR. SIESS: That I didn't have much chance understanding and I can't quite see how anybody could misunderstand that. I had no problem understanding that.

MR. WYLIE: I think it's fair to say that I don't think the subcommittee fully understood what the X's meant. I don't think that the vendors did, and I don't think that NUMARC did, at least from what they indicated in their presentation.

MR. SIESS: The thing that is bothering me, if I read it right, if the vendors are not mistaken about what they think the staff is saying and if the Commission accepts the staff's recommendations to go the route that the vendors think the staff is recommending that they go, then there won't be any standard plants and we don't care where the X's are.

We're down at the level of details now when we ought to be trying to decide a major issue. Is anybody interested in building the standard plant? We discussed a little bit this business of; is standardization to be required? Is it to be encouraged? Is it to be not discouraged?

MR. IMBRO: I think that what we recommended is that we be allowed to develop a Reg Guide, based on --

MR. SIESS: Now, that's in your SECY, that recommendation?

MR. IMBRO: Yes.

MR. GRIMES: Yes.

MR. SIESS: Can you give me the -- let's say we wanted to endorse that recommendation which would now put you back on the ABWR on the licensing review basis, rather than what's represented by this figure; is that right?

MR. IMBRO: That, I can't answer.

MR. SIESS: I have trouble understanding this in the abstract. Now, we have a very specific case.

MR. GRIMES: If you look at page 20, Dr. Siess, you'll see the staff recommendation for the Reg Guide. Recommendation No. 2 refers to the Regulatory Guide.

MR. SIESS: The staff recommends that the Commission agree with the general approach presented in the above conclusions of this paper. It also recommends develop and issue a Regulatory Guide in accordance with the above conclusions that describe for the applicants.

Now, GE said what do we need a Regulatory Guide for? We have a license review basis.

MR. IMBRO: I'm not really familiar with the license review basis, I'm not really close to the -- that close to the ABWR process and I can't really recall on that one.

MR. SIESS: Do you mean the people that are developing this standardization procedure, aren't familiar with what's going on the past 2 years in the review of the only standard design we come up with?

MR. IMBRO: Generally we are, but I -- I don't know exactly all that's in the licensing review basis.

MR. MICHELSON: Well the licensing -- my familiarity with the licensing review basis doesn't help me much on this issue of scope. The Committee wrote a letter on module 1 of the ABWR in which we pointed this problem out, that there is a question of the inadequacy of what's being provided, versus what appears to be needed. That's what this is addressing.

MR. SIESS: Have we written a letter on the adequacy of the license review basis?

MR. MICHELSON: No, no we did not. No.

MR. SIESS: But you think it's inadequate and we should have?

MR. MICHELSON: No, no, I'm saying that the -- the submittal was in there.

MR. SIESS: Well what about combustion engineering, where we wrote a letter saying they didn't need a license review basis, or at least some of us thought that, because they had worked everything out. But now, they haven't got the kind of detail that the staff's talking about here.

MR. CARROLL: I think Bert Wolf's letter overstates the -- the significance of the licensing review basis.

MR. SIESS: Well, but there's another letter from Westinghouse and another letter from ABB Combustion and they all seem to --

MR. CARROLL: No, I'm -- I'm just addressing, specifically, the question of the relationship of the licensing review basis to this.

MR. WYLIE: Well, I think -- I think what this points up is there going to have to be a lot of interaction.

MR. SIESS: This is what I think is important -- somebody, you think that eventually, we're going to have standard plants, if they just negotiate enough, and I -- I'm not that optimistic and I -- I wonder how much time we want to spend on something that's going to be, you know, just history?

MR. SHEWMON: There's a note back here.

MR. GRIMES: I had one -- one comment. That it's my observation that for some time now, people have been talking in words and the effort here was to get specific to specific design products that could be talked about and agreed on in a more definitive way. Because what licensing basis is to one person, it's not to another person. What standardization is to one person, it's not to another person. What's required for safety to one person, is different to another person.

What we tried to do was form a basis to enter into a dialogue with the industry to reach agreement on what, specifically, will be required.

MR. SIESS: Yes, but I still look at where you com down and -- and -- I have to go back, in a minute, to this question that you're conclusions are different than what I thought they were, that you want to go back to something. But all that did is refer me back to the previous page and I haven't had a chance to read that.

You say, you're asking the Commission to let you drop this stuff and go back to something earlier?

MR. IMBRO: No, no, no, no. What we asking -- what we're asking the Commission to do is to -- to let us -- give us their permission to prepare a regulatory guide, based -- based roughly on -- on these tables. These tables would form kind of the outer bounds of what we'd possibly expect. They could be fine-turned and perhaps we could be a little bit -- not to into as much detail on the Turbine Island.

MR. SIESS: But now, somebody has made the estimate that essentially, for the ABWR, you'd have to have about twice as much as you now have, right?

MR. IMBRO: Yes.

MR. SIESS: Is that number likely to change significantly as you refine all of these details?

MR. GRIMES: If I can make a general estimate. I would say it will change somewhat, but I don't know if we'll split the difference or whether it will be perhaps two-thirds of what GE estimates is an additional amount. But I -- I guess I would also comment that I don't think we've seen the end of the iterative process that the staff has been working on in the question and answer and the detail they will need to finally come to a safety conclusion.

MR. SIESS: But you have been working on that, right?

MR. GRIMES: We are generally -- we've been talking to people that are working on that.

MR. SIESS: Do you have any idea as to whether you'll continue with the certification plan on the ABWR?

MR. GRIMES: Well, we expect to do that in parallel, yes. The review process will be continued --

MR. SIESS: You expect them to continue to provide more and more information up to that level?

MR. GRIMES: Yes.

MR. SIESS: In spite of the fact that they said they -- they don't think anybody's going to gi'e them $200 million dollars to do it?

MR. GRIMES: I don't know if it will cost $200 million, but we will require additional information to get to a level where we can be --

MR. SIESS: I'll know what you'll require, but if nobody's going to get a plant certified, I don't care what you'll require. This is only important if we're going to have plants to certify.

MR. GRIMES: I'll just comment that last week Toyota announced they were investing $800 million in a new plant in Tennessee. They're --

MR. SIESS: It wasn't nuclear, though.

MR. GRIMES: -- they haven't sold a car yet.

MR. SIESS: Wasn't nuclear, wasn't regulated either.

MR. CARROLL: They've sold lots of cars.

MR. MICHELSON: I think it was in Kentucky, besides.

MR. CARROLL: Let me ask this question, as a follow-on to what Chet is saying. If -- if the standardization emphasis wasn't there and somebody told you hey, staff, don't worry about standardization, just worry about getting what you need in order to make a safety determination, how much of this would be necessary?

MR. GRIMES: I -- as I remarked earlier, I think we're probably close to what the tables indicate for the nuclear island and balance of nuclear would be required which is more than is done at present in the ABWR design, for example.

MR. CARROLL: So, how could the part of -- portion of the staff that's working on the ABWR and GE be so far off target at this point?

MR. GRIMES: I don't think they are. They're just not that far along in their review. They're still -- for example. in the I&C or control room areas, they're still asking very fundamental questions. They have to yet get information that they can do a single failure analysis with. I don't think we're right near the end of the current staff review.

MR. CARROLL: So how about the $200 million that Burt talks about plus 2 years, which you said the other day, was about the same as what you're estimating? What would that be if -- if your charter was not to consider -- be concerned about standardization, just safety?

MR. GRIMES: I'd say it's still a problem. My guess, it would take half to two-thirds of that. But that's just a guess.

MR. SIESS: Now, what if it was PDA/FDA instead of something else? You could give them a PDA on what they've got now, could you?

MR. WARD: That is the same -- what Jay is asking.

MR. SIESS: The problem is they can't sell the plant until they have an FDA they might, but with the certification, they think they can.

MR. KERR: Will somebody try to help me? I'm puzzled by Mr. Grimes' response because I read Burt's letter to say that he would have to spend or expected to have to spent $200 million more than if he continued to with the licensing basis review approach; not $200 more from where he now is.

Mr. Grimes seems to be interpreting the letter to mean that the $200 million includes some that he'd have to spend if he continued on the present path, so.

MR. GRIMES: Yes. My judgment was based on the fact that he indicated that GE thought they were essentially finished with the ABWR review process, and so I didn't see him estimating very much additional money from his standpoint.

MR. KERR: So you think that GE and the staff interpreted the licensing review basis quite differently, even though they spent quite a lot of time negotiating it?

MR. MICHELSON: The scope of these submittals was not defined in the licensing basis agreement. That wasn't the subject of the agreement.

MR. SIESS: What was?

MR. MICHELSON: It was a lot of general licensing considerations and a lot of which you might call tier 1, but not this tier 2 information.

MR. SIESS: Was it safety-related or standardization-related?

MR. MICHELSON: I'd have to go back to answer that for sure. It was assumed to be standardization-related.

MR. KERR: Well, I can't understand why it was called a licensing review basis then, if it weren't the basis for licensing review?

MR. MICHELSON: If I recall the history of it, the subcommittee was not satisfied with it.

MR. KERR: I'm not talking about what the subcommittee thought, I'm talking about what the staff and GE agreed upon.

MR. CARROLL: There was a letter that said this is a good way to proceed subject to change without notice, is about what it amounted to.

MR. KERR: So nobody ever agreed to it but GE; is that right?

MR. SIESS: I think we're hearing an absolutely astounding example of instability in the licensing process. And I'm not talking about a period of years; I'm talking about a period of months.

MR. MICHELSON: It's a longstanding misunderstanding of what it takes to review a design with paper only. We've never done it before with paper only. And now we're for the first time trying to certify a design on the basis of walking through paper. It's never been done.

MR. SIESS: I think I hear what you're saying. But I don't understand it the way you're saying it.

We've always reviewed designs with paper only. The paper might be drawings; the paper might be words. What you're concerned about is that the review of what's on paper has to substitute for a review of the physical plant as built.

MR. MICHELSON: Which was part of the standard review process in the past.

MR. SIESS: Yes.

MR. MICHELSON: From my experience, the NRC did a preview of --

MR. SIESS: It was not the first time we reviewed a design based on paper.

MR. MICHELSON: You never approved the final design based on paper only.

MR. SIESS: Never approved the final plant based on paper. You have to make a distinction, gentlemen, between a design and a plant.

MR. MICHELSON: Well, this is a plant.

MR. SIESS: This is a design.

MR. MICHELSON: No, no, this is an essentially complete --

MR. SIESS: It's a design. We may never see that plant, at the rate we're going.

MR. WILKINS: Mr. Chairman, I'd like to ask, where are we going; where are we; and what do we hope to accomplish this afternoon? Because I think our velocity at the present time is zero. Negative? Well, no, it's random. I'm unable to discern any pattern to our discussions.

MR. WYLIE: We're trying to get a clarification of what's in the SECY.

MR. WILKINS: Why?

MR. WYLIE: So that we can write a letter.

MR. WILKINS: Oh. All right. So we want to write a letter.

MR. WYLIE: You have to write a letter.

MR. WILKINS: I don't see that anything that we've said in the last hour has contributed to my ability to write a letter.

MR. MICHELSON: Have you read the SECY?

MR. WILKINS: Yes.

MR. MICHELSON: Well, that's what we're working on. If you understand it completely and need no clarifications, fine. Some people do.

MR. CARROLL: Maybe you ought to write the letter.

MR. SIESS: I've read it. I understand it.

MR. WILKINS: I'll bet I can write four different letters. And one of them might even be acceptable.

MR. WYLIE: Well, why don't we let the Gene go ahead and finish, and then we'll have NUMARC to answer some questions.

MR. IMBRO: Before I move on to this last slide, and this will be quick, are there any more questions on Xes?

[No response.]

MR. IMBRO: Okay. This is quick.

[Slide.]

MR. IMBRO: And what we're trying to show here is that, at the time of COL -- and this is not design certification -- at the time of COL, that we would expect that the site-specific systems, or the portions of site-specific systems that reside in the yard or in intake structure, be completed to a level equivalent to the balance of nuclear island and the turbine island as it stands now, Level 2.

At the design certification stage, clearly, the site-specific systems are back in here.

That's all I have. Thank you.

MR. GRIMES: I have one clarifi[illegible]on back on equipment qualification, if I could just go through that once in terms of Tier 1, Tier 2, and available for audit.

I think we pointed out the item that would be a Tier 2 item, describing the methodology for proceeding through the EQ. The Tier 2, or the application itself, would be much as the current FSAR, which would probably include a vendor topical report on how the EQ process was to be completed.

The material available for audit would have specific component data sheets which would reflect the EQ conditions for each component. That would not be in Tier 2 but would be in the material available for audit.

Then, after certification and after the plant was completed, as part of the reconciliation process, you would go back and validate, based on the actual plant, as-built conditions, that the components fell within the envelope of their procurement specifications, much as you do today.

MR. MICHELSON: You're saying that's like a walkdown?

MR. GRIMES: Yes. And an examination of any additional hazards that might have been included.

MR. MICHELSON: Now, that would be done at the time of a COL?

MR. GRIMES: No, after the COL, before plant operation.

MR. MICHELSON: After COL --

MR. GRIMES: As part of the final reconciliations. Thank you.

MR. WYLIE: Any other questions for the staff?

[No response.]

MR. WYLIE: Okay. If not, I guess Bill Rasin of

NUMARC will make their presentation.

[Slide.]

MR. RASIN: This has been an interesting discussion. I would like to make a few statement I guess in response to a couple of the comments from the Committee and then very briefly summarize where industry is at this point with regard to SECY 90-377.

It was asked if industry has any interest in building a standardized plant. I can tell you the answer is yes, we have a lot of interest. In fact, in November the Nuclear Power Oversight Committee released its strategic plan, which I passed out to the subcommittee, entitled the Strategic Plan for Building New Nuclear Power Plants.

It contains many of the action items that we feel are necessary on many different fronts in the industry to allow the current plants under design to be certified and for a plant to actually be in operation by the end of the century. We are not making very much progress since we published this in November, obviously.

NUMARC and in my division particularly responsibility for two of the boxes in there. One is predictable licensing and stable regulation. The other is enhanced standardization beyond design. I am not doing a very good job in either one of them right now.

That lack of stability is one of our main concerns.

We are committed to standardization in the industry. I was involved since the mid-1980s when we started many of these activities, like the EPRI/ALWR program. At that time I was with Duke and was on the EPRI Division Committee. My management, Rick Priory, chaired the then-AIF group on standardization, which at that time was busily working with Congress. That group's evolved into our Standardization Oversight Working Group at NUMARC, currently chaired by Bill Counsel.

So we have been working for standardization both on the regulatory front and on the technical front in terms of the product.

I think we have the same hopes for standardization. I have the same kind of gut feel that perhaps standardization will in some way provide this intangible goal of safety but I don't think we will be able to define it any better than the Staff can define it and I think it remains a hope.

The fact is we see standardization as being a major benefit to economics, both to the industry and to the regulator.

We now have over a hundred plants operating safety and they must be safe or the NRC will shut them down, and we must operate them safety. We can't afford to do otherwise.

The process has not been economic. We have taken a lot of hits that, well, all these plants are all different. That causes a lot of problem. It causes inconven'ance for the regulator.

We recently resolved the station blackout issue. If all 100-plus of those plants had been BWR-6's with MARK III containments, that would have been easy. It would have cost the Staff a lot less resources to know what to do. It would have caused the industry a lot less resources to implement those fixes but the plants would be safe, just as they are safe now. It would have been done more economically and I don't think it automatically leads that they will be done any more safely although we all have this gut feel and we all hope so.

Even in a regulatory sense we think the major impact of standardization is economics.

[Slide.]

MR. RASIN: I'd like to go to Slide 5 in my handout package. I think I'll skip over the others.

We will conced: that we in the industry are confused over SECY 90-377. You commented on the vendor letters. If one listens to the Staff presentations, then obviously maybe the vendors didn't understand.

If you remember my presentation Tuesday, I didn't understand. I am still willing to admit that perhaps we don't understand.

Our concern is, however, that if we don't understand, no one understands and if the SECY is left to stand in its present form without any of us understanding, it will eventually come to be interpreted in its worst possible form.

We recognize that the NRC has done a tremendous effort in creating this document. There was a lot of work that went into those tables. We feel that the Staff did a tremendous job in achieving a high level of understanding of the design process and the design products that come out. We think they are to be commended for that.

It will serve perhaps as a useful point for us to try to take what are now just definitions and concepts in our own minds and turn them into details that perhaps we can both understand to a high level.

We note the acceptance of the Staff at least in the SECY of the two-tier approach, the flexibility provisions, the philosophy of a graded approach to a level of detail, to the philosophy that the level of detail should equate to an FSAR minus as-built and as-procured information.

[Slide.]

MR. RASIN: We have concerns with the level of detail and here may be one of our misinterpretations but we did misinterpret it rather consistently in the industry and that is that feasible and practical was being introduced as a new regulatory standard.

We hope that the presentation of the Staff today holds up at the Commission meeting tomorrow and at the end of that meeting no one any longer thinks that feasible and practical is a regulatory standard.

MR. CARROLL: I'm afraid I came away believing it was.

MR. RASIN: I guess we'll see.

We believe that the SECY in addition to the level of detail question does contain or appear to contain some new and substantial requirements for design certification beyond anything we read in Part 52.

The Independent Design Verification Program is not a current regulatory requirement, nor do we see it anywhere in Part 52 and we question all of a sudden its inclusion as a regulatory requirement.

The Tier 3 or the available-for-audit category of information being defined and required whether it is needed and plays any role in the safety determination or not we think is a new regulator" requirement and again beyond what we read in Part 52.

Prototype testing we need some discussion with the Staff for a little bit of clarification. We are not sure what is being proposed there, whether that is or is not in concert with the statements on testing programs and prototype requirements in Part 52.

[Slide.]

MR. RASIN: We believe the finality statements in the SECY are ambiguous, although I believe the picture of it that Mr. Virgilio gave today is pretty close to our interpretation and we would only ask for some clarification so that it can only be read one way.

MR. MICHELSON: Why way did you want it to read?

MR. RASIN: That, in fact, the entire body of material that is submitted in the application and reviewed by the staff and plays a part in their safety determination has issue preclusion for the purposes of design certification, COL, and hearing purposes.

MR. MICHELSON: Tier 1 plus tier 2 --

MR. RASIN: Tier 1 plus tier 2.

MR. MICHELSON: -- as I understand, if it was for audit and you decide it was important for your safety determination, you elevated it to tier 2.

MR. RASIN: It would be elevated to tier 2, that's correct.

MR. MICHELSON: I just want to make sure.

MR. RASIN: The rest of the information's really a moot point. If it plays no role in the safety determination, it's not likely to be the subject of a serious safety issue and therefore probably is a moot point.

MR. MICHELSON: Unless changes are made to that third group of information or are in conflict with tier 1 requirements, then it wouldn't be moot.

MR. RASIN: I would submit to you that that could not be done. The 50.59 process, if done properly, would preclude that from happening.

MR. MICHELSON: Yeah, it should not be done, that's right.

MR. RASIN: There is some disagreement in the industry on a regulatory guide. You'll see by the letters of all three of the vendors that they are quite concerned with the undertaking of the regulatory guide. We will discuss this further as we learn and understand the staff's positions more clearly. Tomorrow's Commission meeting should certainly help that.

MR. MICHELSON: Are you saying you don't think there should be a regulatory guide?

MR. RASIN: I'm not saying that; that's said quite clearly in each of the three vendor letters.

MR. MICHELSON: No, I'm not asking the vendors. I'm asking you as representative of NUMARC.

MR. RASIN: No --

MR. MICHELSON: NUMARC believes there should not be a regulatory guide?

MR. RASIN: No, we have not yet taken that position. That's the subject of continuing discussion with the vendors and the utilities. We're members of NUMARC to determine what is the best way to interact with the staff on these issues.

MR. MICHELSON: If you don't have a regulatory guide, what would you think the process would be for getting these clarifications before, you know, in order to proceed with the certification work?

MR. RASIN: Well, the process that we have foreseen all along, the regulatory guide idea was first raised in this SECY. The process that we have been working on all along, and, in fact, the process we believe is envisioned in Part 52 is that, in fact, the exact content of the certification and the break between tier 1 and tier 2 will be determined as a result of the review done by the staff and discussions between the staff and the vendor applicant.

The standards that apply for what materials need to be submitted are, in fact, the standard review plan and regulatory guide 1.70.

MR. MICHELSON: Okay, you're saying, just use the standard review plan. Whatever you need to accomplish the requirements of the review plan is what's submitted.

MR. RASIN: Yes, sir. That's been the position that we've been working to do date.

MR. CARROLL: How about severe accidents?

MR. MICHELSON: Going to have to write more standard review plan.

MR. RASIN: Severe accident issues, insofar as they are taken into account in the regulations, will be covered by the body of regulations and the material in the standard review plan and the appropriate regulatory guides.

A PRA is also required for these designs. We also have in the EPRI requirements documents in rather stringent goals that we've set for ourselves to take severe accidents into account, we intend to do that. Severe accidents at this point in time are not rolled in under regulations except as done so by the changes to Part 50, post-TMI, and the Commission's policy statement on severe accidents. We intend to comply with all of those things.

MR. WYLIE: Bill, let me ask a question as I get up to the finality statement. Does the provision for making changes after certification to tier 2 information -- do you have a position on that? Does that give you a problem?

MR. RASIN: Well, we have discussed that before. As a matter of fact, I think that was the subject of some discussion when we were here in August -- at your August meetings discussing this issue.

At that time, the position that we have taken -- and, in fact, I believe is written into our ITAAC document, which we have submitted to the staff -- was that we felt that the 50.59 process, in fact, did only apply to the applicant or the holder of a COL and that it did not apply to a vendor who held a certification prior to anyone receiving a combined operating license. We even had our high-priced lawyer here to tell you that's the way we read things.

While that is an awkward process, we believe it is workable. What would have to happen the way that we envision it now is that whatever changes are felt to be necessary, whether they have to be reviewed by the NRC or whether they can be accomplished under a 50.59 process, would have to essentially be accrued and brought forward to the COL process and dealt with at COL and immediately thereafter.

That would be the most practical way to do it. Those that require regulatory approval would more expeditiously be done, I would imagine, in concert with an application for COL and be dealt with at that time in a unified fashion. Those that could be done under a 50.59 process would be identified as intended changes just so that there's no misrepresentation, and then accomplished after the COL. So, it would be a workable process.

We agree, I think, the vendors all feel that it's a cumbersome process. To what degree it will aid the finality and really reduce the possible mischief in the hearing setting, I think, could be debated. The threshold of the 50.59 for hearing contention, we believe, should be -- was the 50.59 process applied properly. If it was not, then you could have an issue. If it was and determined this was a change that have no safety implications, then it shouldn't be admitted as a contention just because it was a change.

MR. WYLIE: Well, that potentially is there. I mean, anybody can always challenge a change.

MR. RASIN: Yes, it's there and the question is, how much risk is there of it being admitted. If you'll recall, in that presentation we acknowledged that that was one of the risks associated with even allowing a 50.59 change process. And we thought that that, in itself, would be a real constraint when using the process. There would be a good deal of conservativism that went into the safety significant determination.

MR. WYLIE: Am I to read you then that this has been discussed in NUMARC and you've come down on the side of what the staff has proposed.

MR. RASIN: I think where the staff is now is we were at that point in time. We all agreed that we would like some other change process and that perhaps sometime we should talk about that.

MR. WYLIE: Right now, T2 information and the information for audit that is used, as I gathered, will be handled like T1 information.

MR. MICHELSON: Up to COL.

MR. RASIN: Yes, that's my understanding from the staff's presentation. But that's also consistent with the position that we presented in August.

MR. WYLIE: So that doesn't give you a problem?

MR. RASIN: Well, as I said, it's a cumbersome process. It could probably be done more smoothly, realizing this risk trade-off with contentions.

MR. MICHELSON: Another clarification, though, unless I misunderstood, the SECY -- it appears that the staff is moving out to the point of authorization for operation before you start using 50.59, not at the issuance of COL.

MR. RASIN: No, that's not the way I read that.

MR. MICHELSON: No, the 50.59 I thought started after authorization for operation. Which is it?

MR. CARROLL: No, between COL and authorization.

MR. VIRGILIO: Let's go back to 52.63, the provisions that invoke 50.59. I think it's best read to apply to somebody who is licensed and authorized to operate.

Because we read it that way, we feel we need to bridge the gap. And we'll bridge that gap by building into the COL itself a 50.59-like process. And about the only change we envision from what's currently in 50.59 right now is the reporting requirements because the reporting requirements for changes now under 50.59 are tied to the updates of the FSAR through 50.71.

MR. MICHELSON: That process will be written to take effect at the time the COL is issued.

MR. VIRGILIO: Yes.

MR. MICHELSON: Not at the time of authorization for operation.

MR. VIRGILIO: Yes. At the time of authorization for operation, then you fall back to 50.59 as written. You won't need this bridging.

MR. MICHELSON: This is an interim 50.59 --

MR. VIRGILIO: Yes, sir.

MR. MICHELSON: -- for some reason, and then you'll fall back to the old 50.59. Is that the plan? Okay I understand. Well, I think I understand what he's saying. And NUMARC has no problem with that arrangement or, at least, I heard none.

MR. WYLIE: Maybe I didn't understand. I didn't quite understand that.

If I read this, this says, the staff proposes that the design certification itself required that any change to tier 2 information before the issuance of a COL be process in a similar manner as tier 1 changes, okay.

MR. CARROLL: I think this is a very good summary.

MR. MICHELSON: But it's better to read though.

MR. WYLIE: All right. Go ahead.

[Slide.]

MR. RASIN: As we interpret or misinterpret the requirements of the SECY, the additional costs -- and this is from input that we have received from the vendors and all the four ongoing ALWR projects in progress -- would be in excess of $500 million.

All of them have indicated that there's extremely low probability of financing the additional work without an order and no possibility of order until designs are certified.

[Sl'de.]

MR. RASIN: The scheduled extensions that are predicted, if, in fact, the level of detail in the tables attached would be required, is estimated for the evolutionary plants to be from three to five years.

The passive delay is somewhat uncertain but obviously will be impacted significantly by the delay in the evolutionary and the additional investments necessary to complete the evolutionary certifications.

MR. CARROLL: Do you have an explanation, Bill, for what we were exploring about the ABWR, how the staff and GE could be disconnected at this point in terms of what's going to be required?

MR. RASIN: I question why they're disconnected. What I read in the appendix to the SECY is a cost estimate from the staff that's fairly close to the cost estimate that GE has in their letter of the additional amount to be continued. So, I'm not sure there's a disconnect. There might be a small overlap, as Brian suggested, as to whether they're almost done their FDA review or not, but I read the estimates as being pretty consistent.

[Slide.]

MR. RASIN: Our conclusions at this time, while we certainly are unhappy with any further delay in defining this issue and proceeding forward again to get back to some engineering work is that the Commission should not approve SECY-90-377 as written. Even if the interpretation is as was presented here at this time, we don't think that it will stand the test of time, given all the confusion we have had reading the SECY.

The concept of feasible and practical -- again, we hope that that is not a new regulatory requirement and that it was, in fact, a misinterpretation on our part.

MR. CARROLL: You should have read maximum technically achievable.

MR. WARD: Bill, let me ask you, if that was, if you do feel more optimistic about that today, would you say that should influence -- and if you could explain that to the vendors, would their estimate of $500 million still hold?

MR. RASIN: I think not. If the message is that the table is the most you could ever hope for in your wildest dreams, and that's going to cost $500 million, but you realize your wildest dreams are not to be realized, then obviously the cost is going to be less. And through the process of developing a reg guide or whatever other vehicle it is that finally defines what the level of detail required is, the cost estimate will change accordingly.

We believe that because of the cost and schedule delays, in fact, if proceed as we understood the SECY and as it appears to read, that the NPOC strategy plan and the nuclear option is truly in jeopardy at this time.

We do intend to provide more detailed comments on the document and the level of detail as soon as we possibly can. We are working on it. Each of the vendors are studying it further. We're all very anxious to hear the Commission meeting tomorrow and we will provide that further input to the staff and the Commissioners just as soon as we can.

MR. CARROLL: Who is coming from industry tomorrow?

MR. RASIN: Well, I will have several people from my staff there. Each of the vendors will be represented, and I guess a host of others. This is a meeting for the staff to present their views to the commissioners; it is not an opportunity for anyone else to have a say. So we'll be in the audience listening intently.

MR. MICHELSON: Is there another time scheduled for you to make your pitch?

MR. RASIN: We have not at this time asked for a spot on the Commission agenda. We would like to have, perhaps, some discussions with the staff, and to do our homework to make sure that we know what we're talking about and, in fact, have something new to say.

If, at that time, it seems as though we have important information to present in a public Commission hearing, we will request one.

MR. WYLIE: Could I ask Marty or Brian, what is the pitch the staff is going to make to the Commission tomorrow? Is it essentially what we've heard here?

MR. VIRGILIO: I intend to use the same slides. Dr. Murley will give an overview that basically discusses some of the issues that were brought out today through the question and answer process. Brian, Gene, Rebecca and others will be there to respond to questions that are raised by the Commission.

MR. WYLIE: Okay. All right. Based on what you've heard in the staff's explanation, Bill, how far do you think you're off with what the staff has presented?

MR. RASIN: Well, that is very difficult for me to answer. You know, the words sound good, but when we talk about, Well, to what degree does this contribute to standardization, and perhaps this system's important because it can cause a transient, well one can take that pretty far.

If Level II detail is necessary in turbine drain system because you can show some scenario or other that could cause a transient, I think we're probably still pretty far apart, and I don't think we're very far from the tables that you see there.

MR. WYLIE: Well, I noticed the generator hydrogen system wasn't in there.

MR. RASIN: I don't know how we missed that. We'll pencil it in. Thank you, Charlie.

[Laughter.]

MR. RASIN: I would like to say, we hope we come out of this where we thought we were starting back in the mid 1980s, and that's what the process in the industry and in the regulator that, in fact, promotes standardization, allows standardization, which, quite honestly, under the

Part 50 process, is impossible. It was tried, and was not possible.

MR. CARROLL: Did you say a key word there -- "allows" standardization --

MR. RASIN: Allows, not forces.

MR. CARROLL: -- as opposed to mandating.

MR. RASIN: Not forces.

MR. CARROLL: If I had to express your philosophy, it's you'd like to go the standardization route, but you'd like the NRC to stay on their turf, which is public health and safety, and let you worry about standardization of balance of plant kind of things.

MR. RASIN: That's exactly correct.

MR. CARROLL: Okay.

MR. RASIN: Any other questions?

[No response.]

MR. WYLIE: Okay. Well, thank you very much.

MR. RASIN: Thank you.

MR. WYLIE: Gentlemen, we have a very rough draft letter that we'll pass out, and I would like for you to think about it and give me any comments, suggestions, or whatever.

With that, Mr. Chairman, I'll turn it back to you.

MR. MICHELSON: Okay. Thank you. This letter will be discussed tomorrow afternoon, sometime after four o'clock. Try to give Charlie your comments in the morning, if you can, so we can get another clean typed copy of it.

MR. WYLIE: Ernest can rewrite it and give us several versions.

MR. MICHELSON: The next item on the agenda, gentlemen, is the preparation of ACRS reports. The first item, which is containment design criteria, I believe David Ward's going to give us some kind of status report.

We don't need to record these preparation reports.

[Whereupon, at 4:55 p.m., the hearing adjourned.]

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission

in the matter of:

NAME OF PROCEEDING: ACRS 368th General Meeting

DOCKET NUMBER:

PLACE OF PROCEEDING: Bethesda, Maryland

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Marilynn Estep

Official Reporter
Ann Riley & Associates, Ltd.

COMMONWEALTH EDISON

DRESDEN NUCLEAR POWER STATION

The Spirit to Succeed

Performance Improvements

December 6, 1990

AGENDA

CURRENT UNIT STATUS

IMPROVEMENT EVOLUTION

FACILITY UPGRADES

PROGRAMMATIC IMPROVEMENT ITEMS

- OPERATIONS
- MAINTENANCE
- TECHNICAL SUPPORT
- RADIATION PROTECTION
- OVERALL STATION

PERFORMANCE TRENDS

The Spirit to Succeed

EEC#2

CURRENT UNIT STATUS

- UNIT 2: SHUTDOWN FOR 12TH REFUELING OUTAGE
  - MAJOR WORK COMPLETED
    - CORE RELOAD
    - REACTOR VESSEL WELD INSPECTIONS
    - ISI & WELD OVERLAYS
    - CONTROL ROD DRIVE REPLACEMENT
  - WORK REMAINING
    - REACTOR VESSEL HYDROSTATIC TEST
    - PRIMARY CONTAINMENT INTEGRATED LEAK RATE TEST

CURRENT UNIT STATUS

- UNIT 3: FULL LOAD
  - 154 CONSECUTIVE DAYS ON-LINE

- 271 DAYS SINCE LAST AUTOMATIC SCRAM FROM CRITICAL ON EITHER UNIT

The Spirit to Succeed

ERC31

IMPROVEMENT EVOLUTION

- NEED IDENTIFIED IN MID 1986 FOR MAJOR IMPROVEMENT EFFORT (SSOMI AND INPO EVALUATION)

- CHANGES INITIATED PROMPTLY

- ADDITIONAL WEAKNESSES IDENTIFIED IN MID 1987 (DET, INPO EVALUATIONS, AND SELF-ASSESSMENTS)

- DRESDEN STATION IMPROVEMENT PLAN (DSIP) DEVELOPED IN FALL 1987

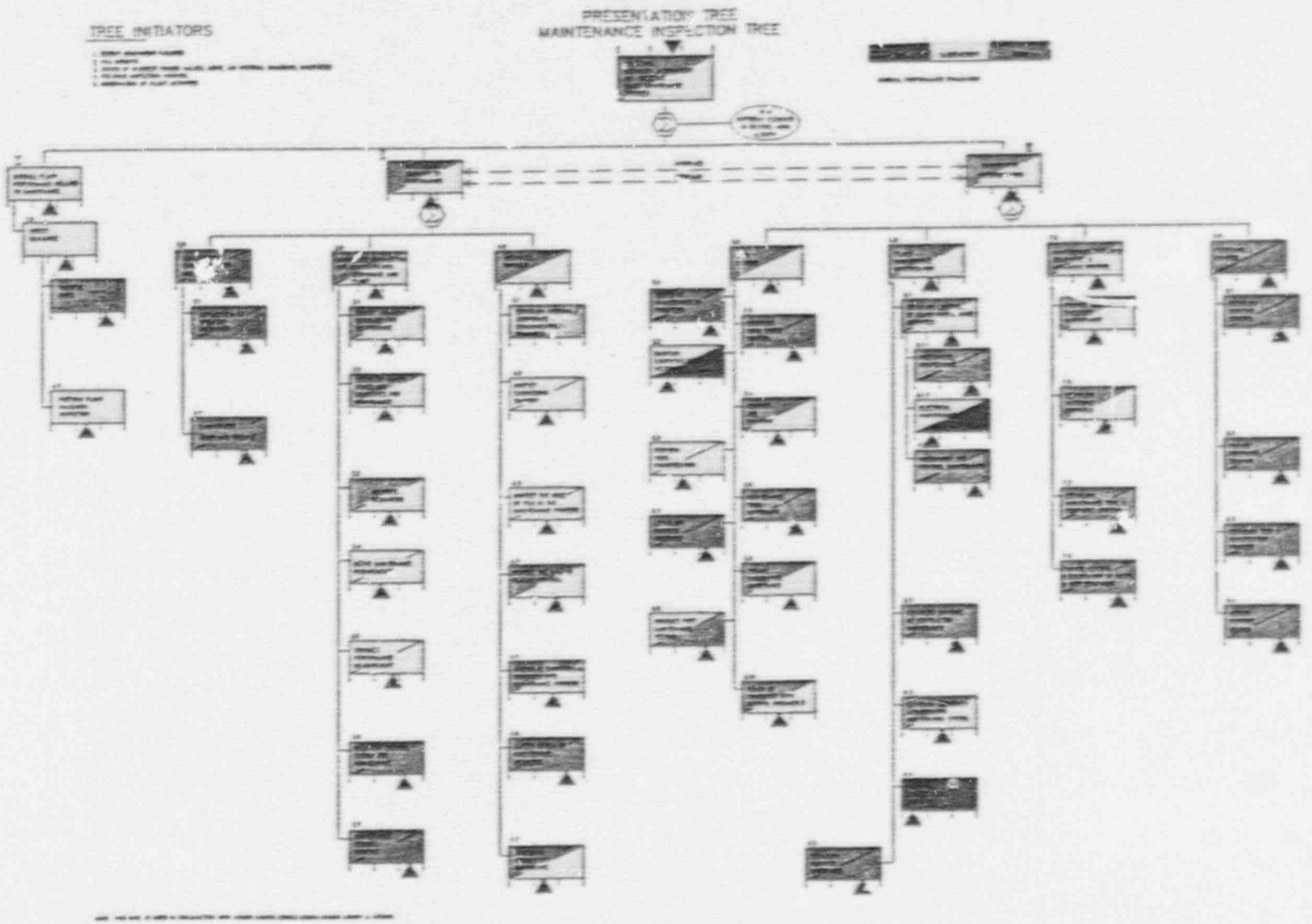
- NRC "CLOSE MONITORING" LIST (10/87 TO 12/88)

The Spirit to Succeed

IMPROVEMENT EVOLUTION

- DEVELOPED & REFINED CORPORATE SELF ASSESSMENT PROGRAM
- RESULTS AND PERFORMANCE INDICATORS PRESENTED TO NRR/AEOD SENIOR MGT. 9/88
- D3 1988 AND 1989 OUTAGES COMPLETED ON-TIME
- NEW IST PROGRAM IMPLEMENTED
- EOP SPECIAL INSPECTION BY NRC
- MAINTENANCE TEAM INSPECTION AND FOLLOWUP

The Spirit to Succeed



TREE INITIATORS
PRESENTATION TREE
MAINTENANCE INSPECTION TREE

IMPROVEMENT EVOLUTION

- RECORD RUNS
  - EACH UNIT INDIVIDUALLY
    - U-2 205 DAYS IN 1987-88
    - U-3 185 DAYS IN 1989
  - DUAL UNIT WORLD RECORD (403 DAYS W/O SCRAM 1987-88)
- NRC SECURITY REGULATORY EFFECTIVENESS REVIEW (RER)
- REDUCTION IN PERSONNEL ERRORS

The Spirit to Succeed

FACILITY UPGRADES

- NEW TRAINING FACILITY
  - OCCUPIED 10/90
  - UPGRADED SIMULATOR
  - NEW COMPUTER AND AUX. PANELS ADDED
  - APPROXIMATELY 70,000 SQ FT
- NEW CHEMISTRY LAB INSTRUMENTATION
- PLANT AND COMPONENT LABELING
- PLANT PAINTING

The Spirit to Succeed

FACILITY UPGRADES

- UNITS 2 AND 3 DCRDR - RELATED IMPROVEMENT ITEMS
  - CONTROL PANEL PAINTING
  - NEW ANNUNCIATOR WINDOW TILES
  - CONTROL SWITCH RELOCATION
- RADWASTE UPGRADE
  - PIPING AND PUMP REPLACEMENTS (STAINLESS STEEL)
  - NEW COLLECTION PUMPS AND SAMPLING SYSTEM
- RADWASTE AREA CLEANOUT AND MATERIAL REMOVAL

The Spirit to Succeed

PROGRAMMATIC IMPROVEMENT ITEMS

OPERATIONS

- 4TH NSO IN CONTROL ROOM
- INCREASED SIMULATOR TRAINING
- OPERATOR OVERTIME CONTROL
- ESF ACTUATION REDUCTION
- EOP UPGRADE
- CONTROL ROOM PROFESSIONALISM/ TEAMWORK

The Spirit to Succeed

PROGRAMMATIC IMPROVEMENT ITEMS

MAINTENANCE

- OVERALL MAINTENANCE IMPROVEMENT PROGRAM INCLUDING IMPLEMENTATION OF CONDUCT OF MAINTENANCE DIRECTIVE

- KEY EQUIPMENT PM
  - MOV'S
  - CHECK VALVES
  - 4KV SWITCHGEAR
  - LARGE MOTORS

- TIME SERIES ANALYSIS OF FIFTEEN KEY SYSTEMS

The Spirit to Succeed

PROGRAMMATIC IMPROVEMENT ITEMS

MAINTENANCE

- SYSTEM & EQUIPMENT UPGRADES
  - SECONDARY CONTAINMENT
    - ROOF REPLACEMENT
    - PENETRATION SEAL UPGRADES
  - NEW FEEDWATER LEVEL CONTROL SYSTEM AND REGULATING VALVES
  - DRYWELL VENTILATION
    - REPAIRED DAMPERS
    - BALANCED SYSTEM

PROGRAMMATIC IMPROVEMENT ITEMS

MAINTENANCE

- SYSTEM & EQUIPMENT UPGRADES (CONT)
  - INSTRUMENT AIR
    - AIR LEAKAGE-ACOUSTIC CHECKS
    - COMPRESSOR OVERHAULS
  - VENTILATION SYSTEM
    - FAN REPLACEMENT
    - FLOW BALANCING
  - CONTROL ROD DRIVE SYSTEM
    - VACUUMED GUIDE TUBES
    - ACCUMULATOR CHANGE OUT
    - REDUCED NUMBER OF OVERHAULS

The Spirit to Succeed

PROGRAMMATIC IMPROVEMENT ITEMS

TECHNICAL SUPPORT

- IST PROGRAM UPGRADE
- CHECK VALVE INSPECTION/REPAIR PROGRAM
- SYSTEM ENGINEER CONCEPT
  - OPERATIONS AND MAINTENANCE SUPPORT
  - STAFFING LEVEL HAS INCREASED
    - COLLEGE GRADS
    - EXPERIENCED PERSONNEL

The Spirit to Succeed

PROGRAMMATIC IMPROVEMENT ITEMS

RADIATION PROTECTION

- PERSONNEL CONTAMINATION EVENT REDUCTION
  - HOUSEKEEPING
  - IMPROVED WORKER ATTITUDE
  - IMPROVED SURVEY TECHNIQUES
- NEW RWP PROGRAM
  - IMPROVED DOSE ACCOUNTABILITY
- IN-PLANT FRISKING STATION RELOCATION

The Spirit to Succeed

BEC16

PROGRAMMATIC IMPROVEMENT ITEMS

RADIATION PROTECTION

- EGRESS CONTROL (REDUCED EXIT POINTS FROM RCA)

- NEW, MORE SENSITIVE GATEHOUSE PCMs

The Spirit to Succeed

PROGRAMMATIC IMPROVEMENT ITEMS

OVERALL STATION

- PROCEDURES UPGRADE
  - ALL STATION DEPARTMENTS
  - WRITERS GUIDE CONCEPT
  - NEW EMERGENCY PLAN IMPLEMENTING PROCEDURES (EPIPs) COMPLETED

The Spirit to Succeed

PROGRAMMATIC IMPROVEMENT ITEMS

OVERALL STATION

- NRC OPEN ITEM REDUCTION
  - MARCH 1987 - 385
  - OCTOBER 1990 - 89
- IDENTIFICATION AND RESOLUTION OF TECHNICAL ISSUES
  - SELF-IDENTIFICATION OF PROBLEMS AND POTENTIAL SAFETY ISSUES
  - CORPORATE ASSESSMENT FUNCTION AND ORGANIZATION
  - IN-LINE ORGANIZATION: CULTURE COMMITTED TO SAFETY

The Spirit to Succeed

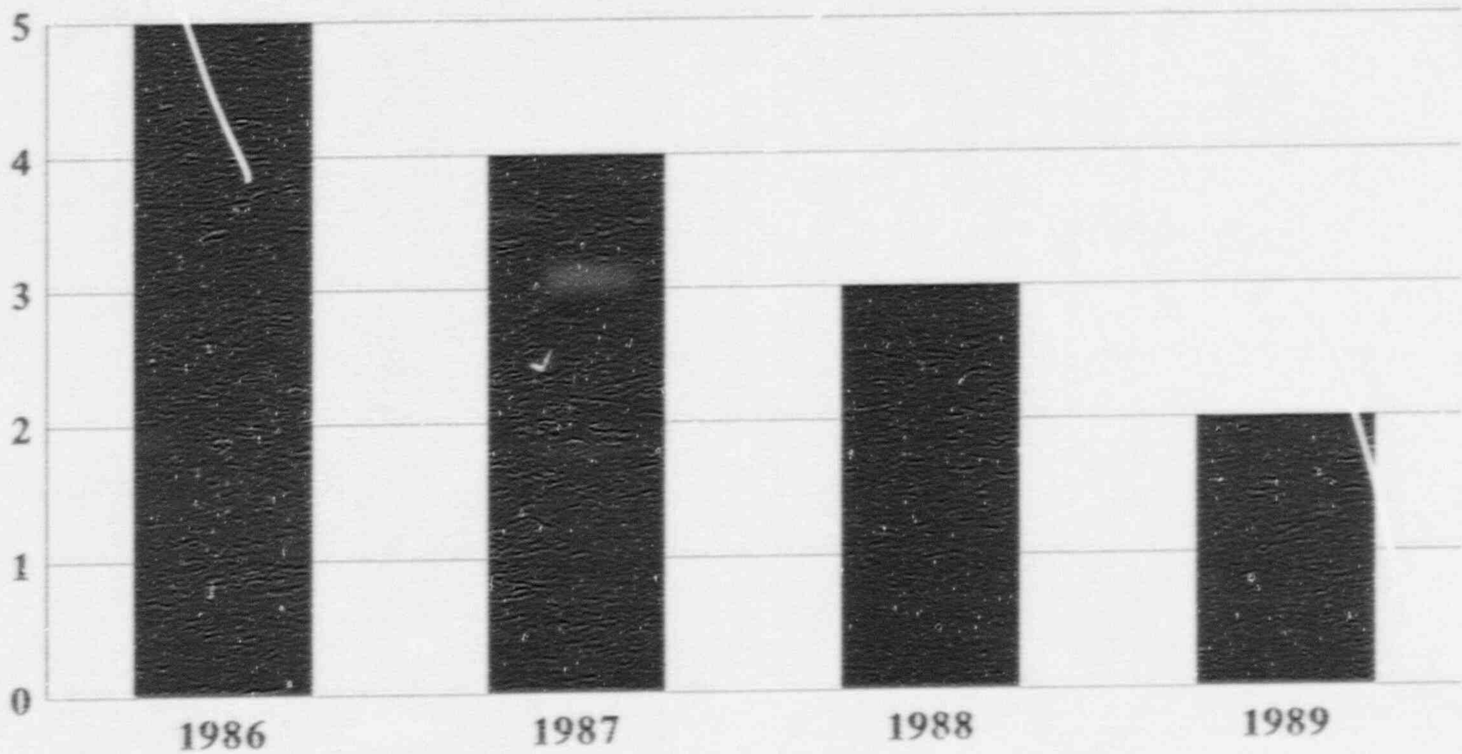
SALP HISTORY

FUNCTIONAL AREA	SALP 7 1/87-1/88	SALP 8 2/88-1/89	SALP 9 2/89-4/90
OPERATIONS	2↑	1	1
RAD CONTROLS	2	2	2
MAINTENANCE/ SURVEILLANCE	3	2	2
EMERGENCY PREP	2↑	1	1
SECURITY	2	2↑	1
ENGR/TECH SUPPORT	2	2	2
SAFETY/QUALITY	2	2↑	2↑

The Spirit to Succeed

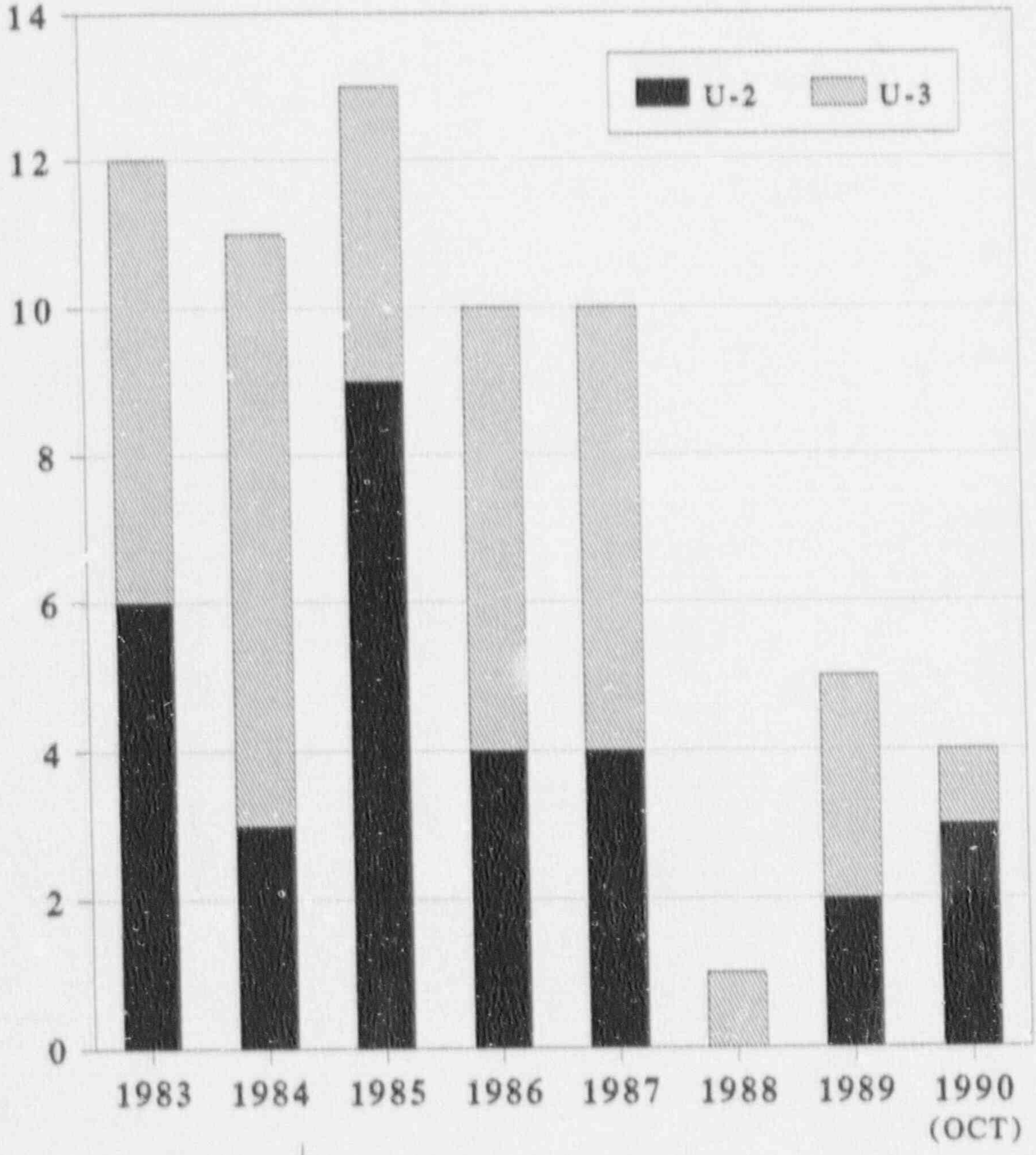
BBC33

DRESDEN STATION INPO EVALUATION



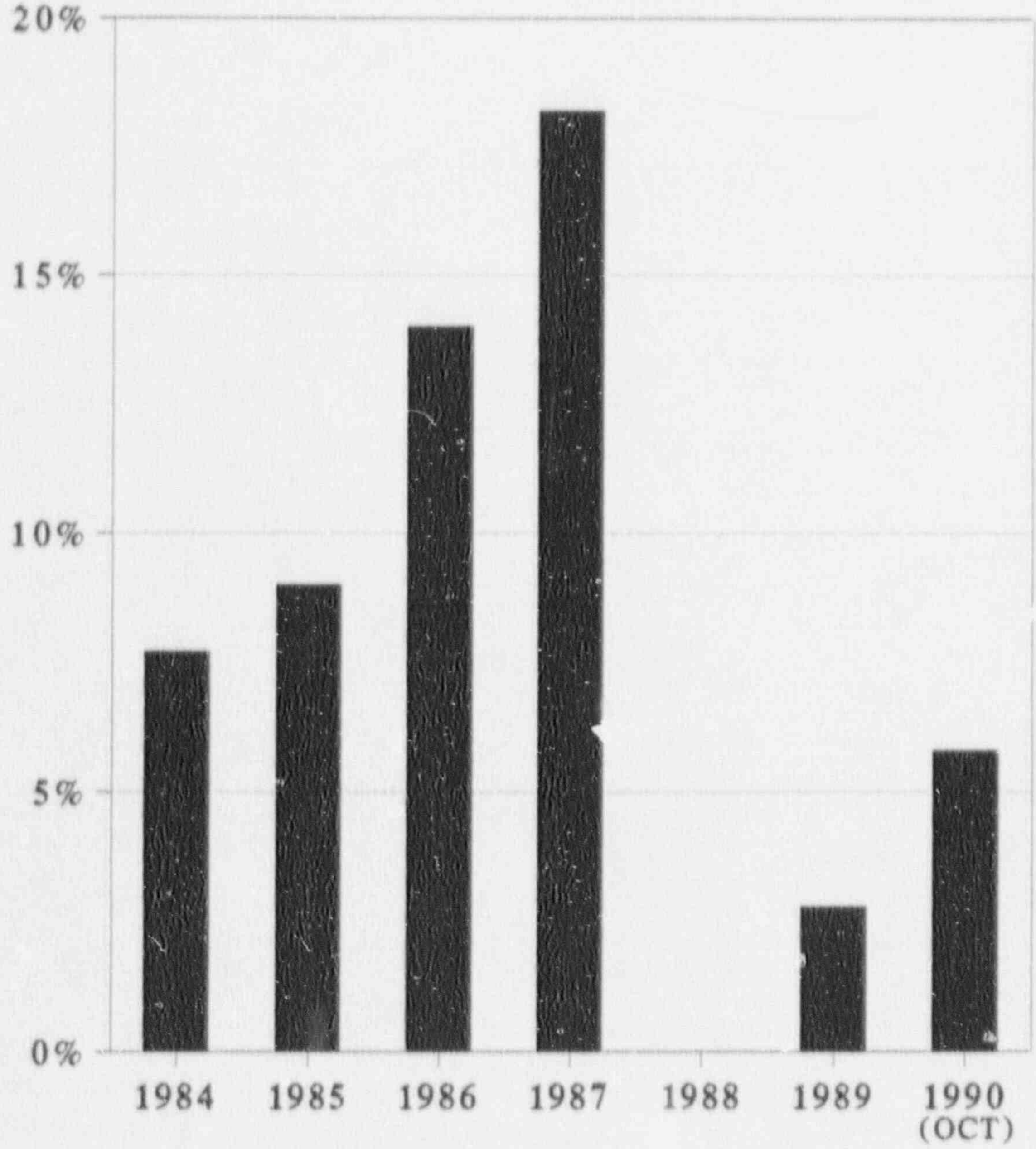
The Spirit to Succeed

SCRAMS WHILE CRITICAL



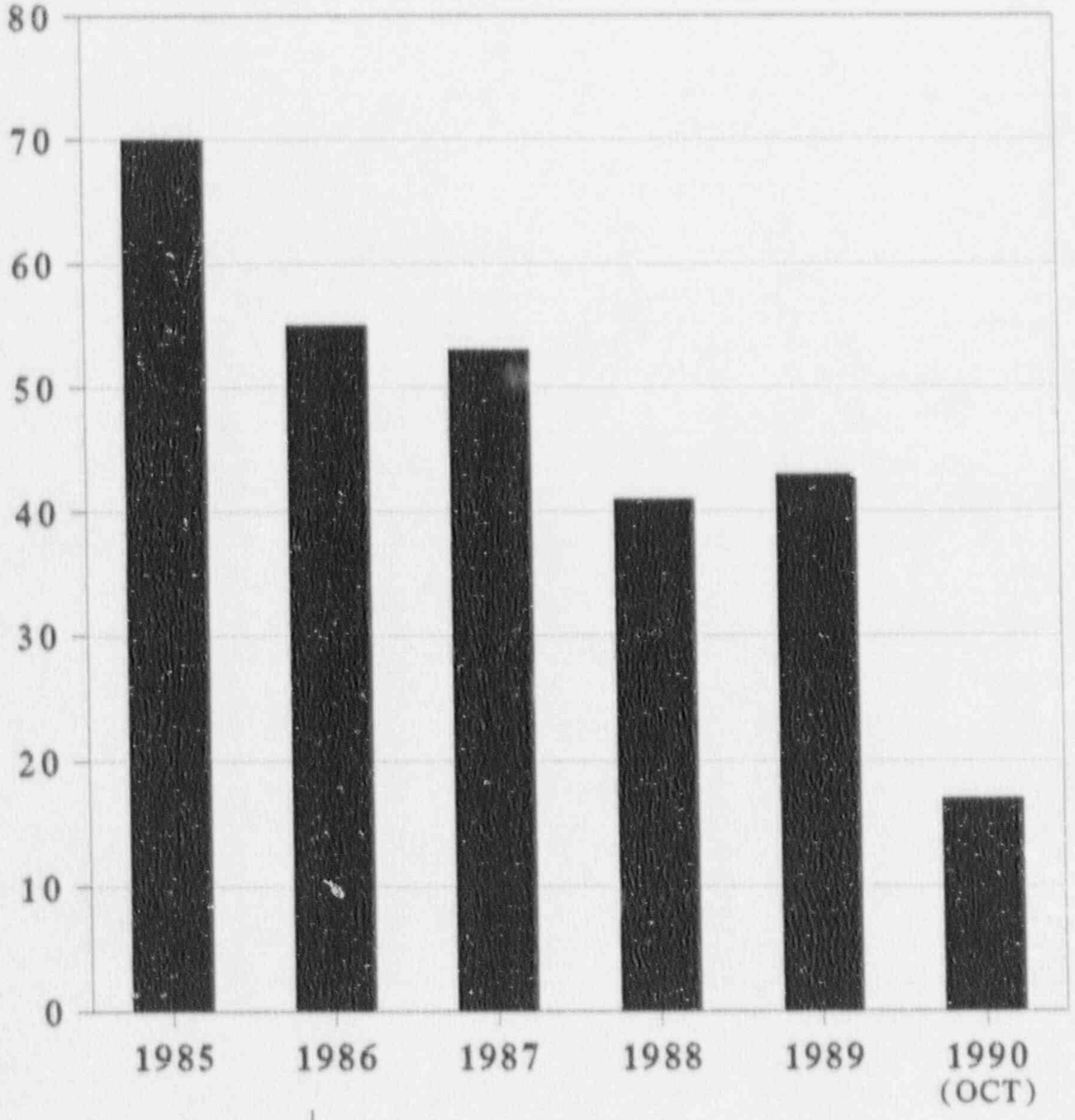
The Spirit to Succeed

FORCED OUTAGE RATE



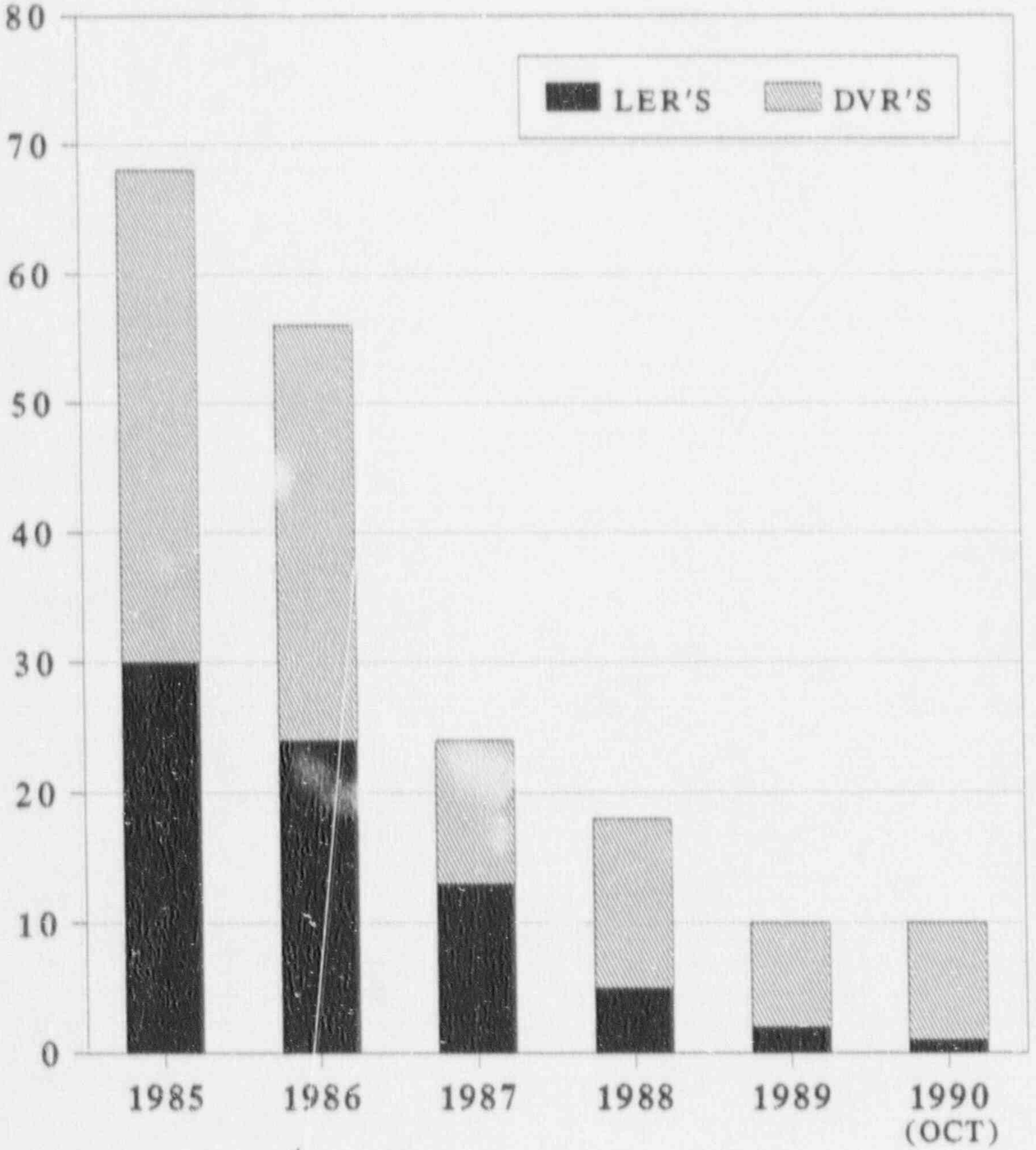
The Spirit to Succeed

LICENSEE EVENT REPORTS (LER's)



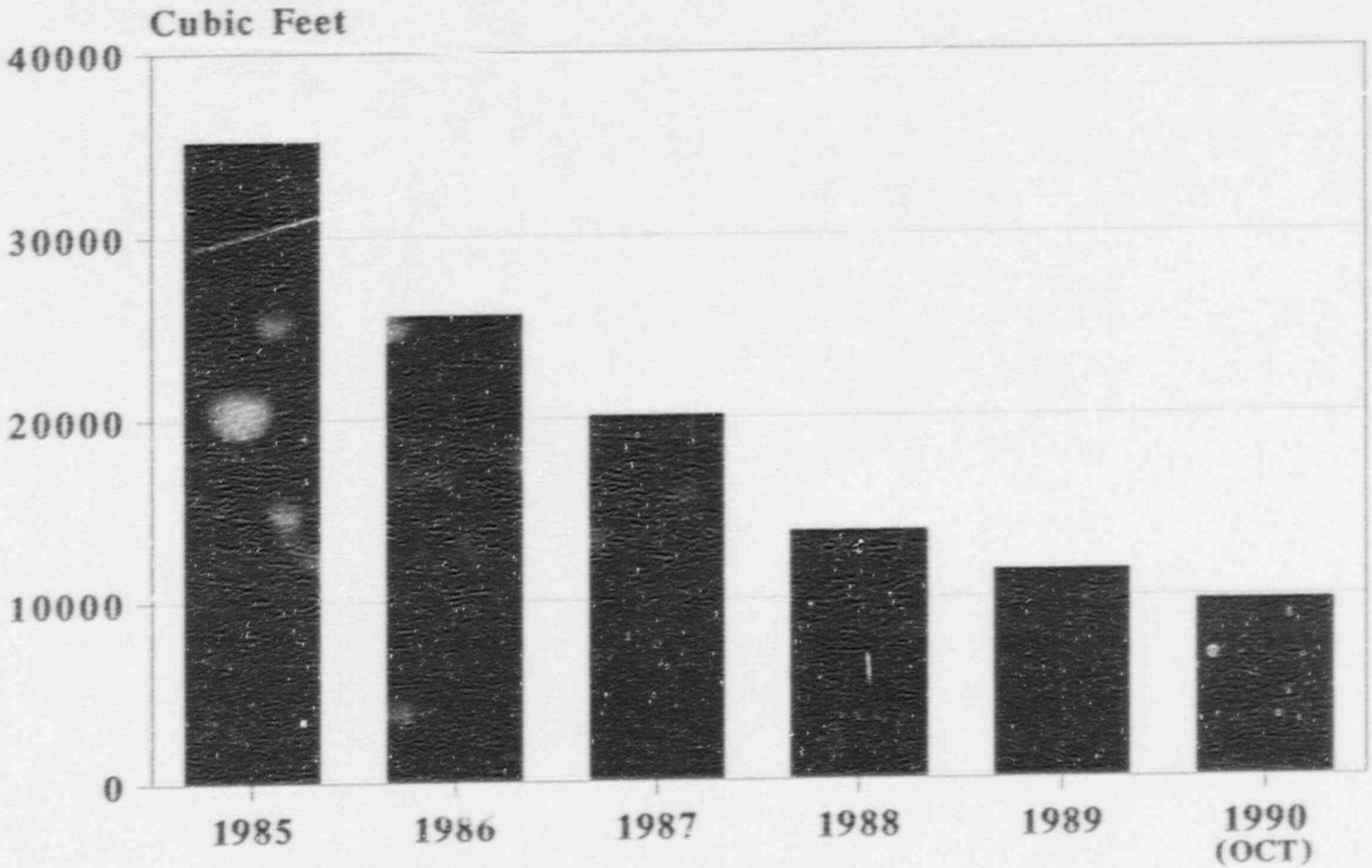
The Spirit to Succeed

PERSONNEL ERROR DVR'S



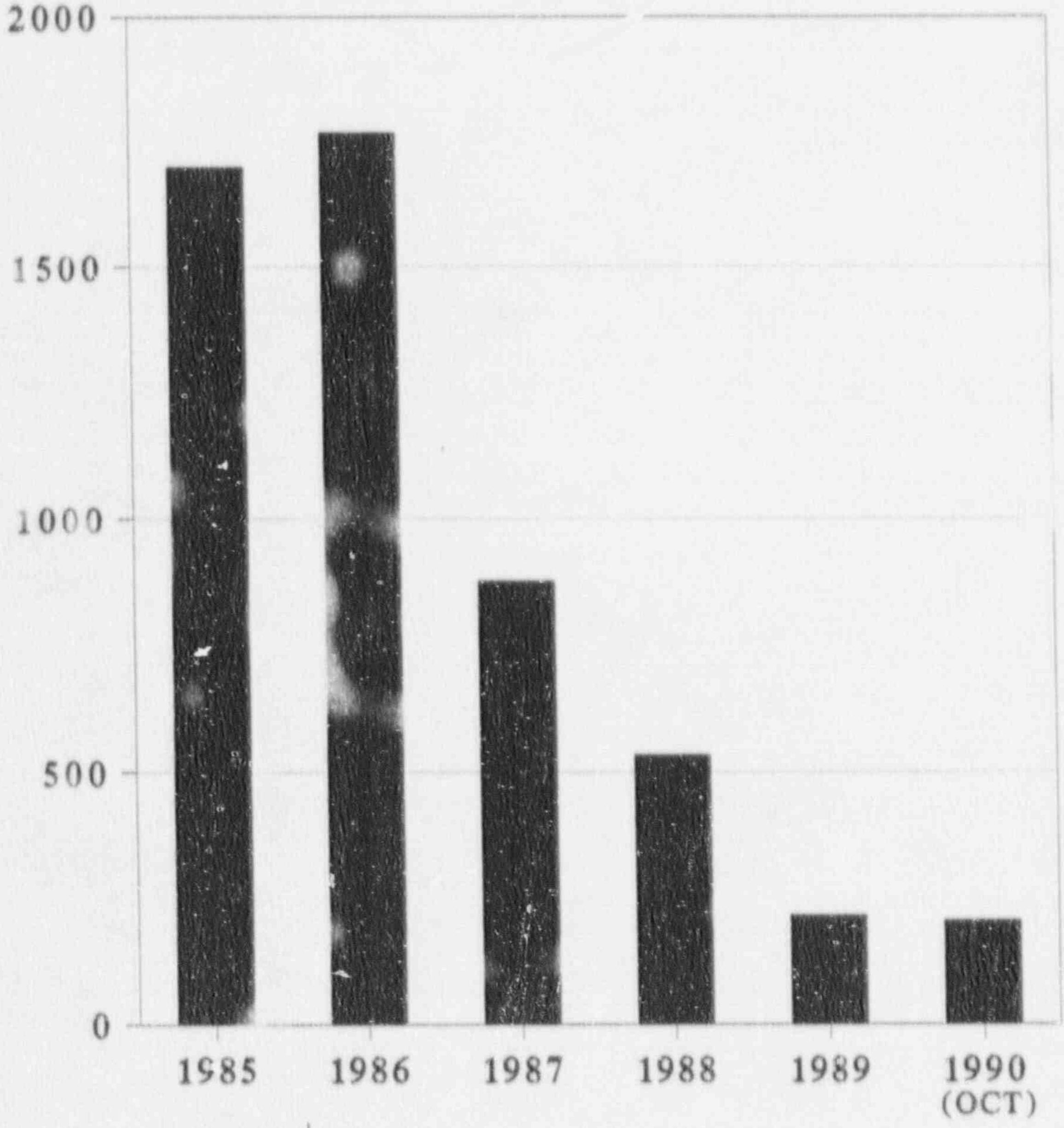
The Spirit to Succeed

DRY ACTIVE WASTE (DAW)

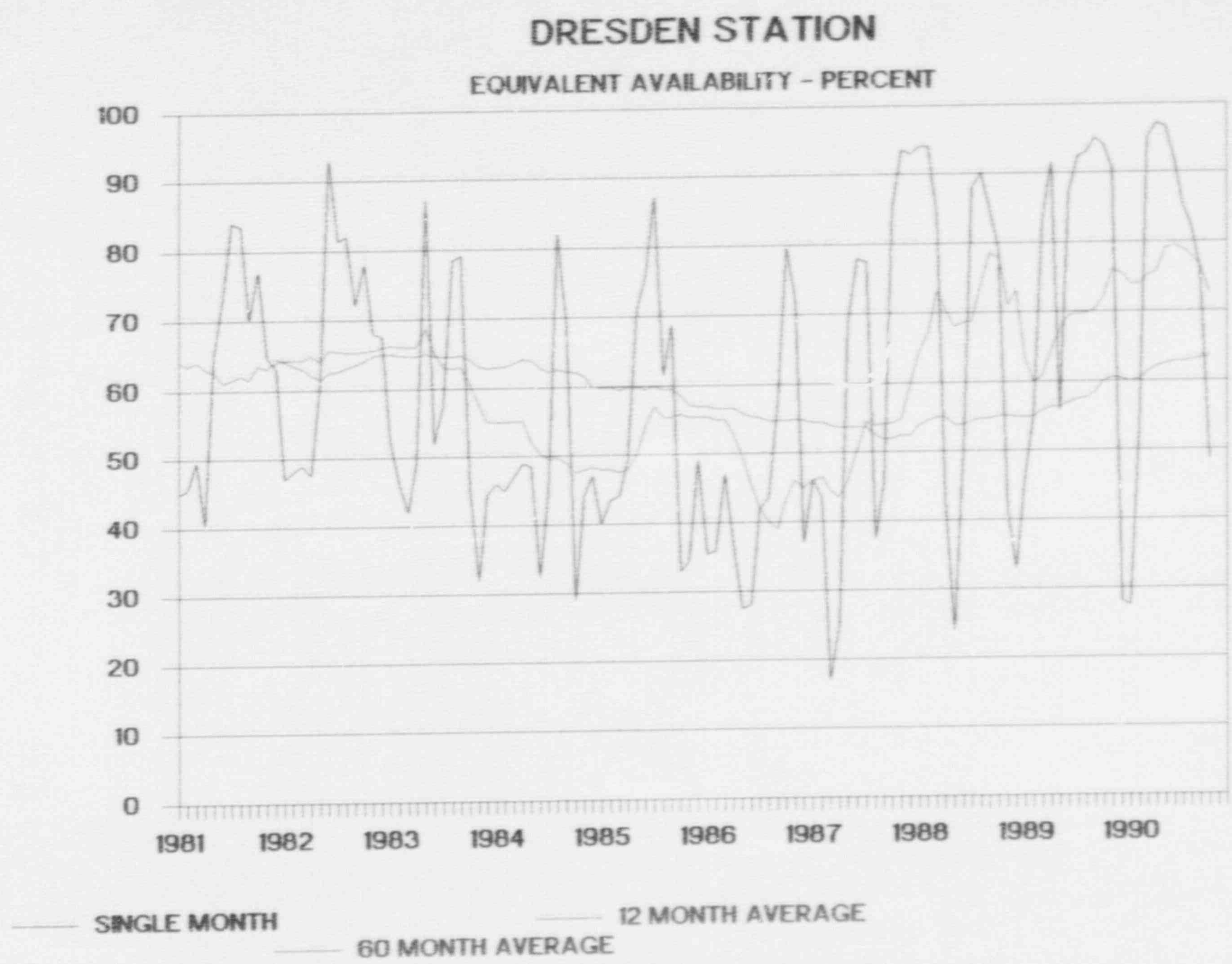


The Spirit to Succeed

PERSONNEL CONTAMINATION EVENTS



The Spirit to Succeed


DRESDEN STATION
EQUIVALENT AVAILABILITY - PERCENT
100
90
80
70
60
50
40
30
20
10
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
SINGLE MONTH
12 MONTH AVERAGE
60 MONTH AVERAGE

NRR STAFF PRESENTATION TO THE

ACRS

SUBJECT: CONVERSION OF PALISADES PROVISIONAL OPERATING LICENSE TO FULL TERM OPERATING LICENSE

DATE: DECEMBER 5-7, 1990

PRESENTER: ARMANDO MASCIANTONIO

PRESENTER'S TITLE/BRANCH/DIV: PROJECT MANAGER/PD III-1/DIVISION OF REACTOR AND SPECIAL PROJECTS

PRESENTER'S NRC TELEPHONE NO: 492-1337

CONVERSION OF PALISADES PROVISIONAL OPERATING LICENSE TO FULL TERM OPERATING LICENSE

- BACKGROUND
- HIGHLIGHTS OF OPERATING HISTORY
- SYSTEMATIC EVALUATION PROGRAM
- UNRESOLVED SAFETY ISSUES

PALISADES POL/FTOL CONVERSION

PLANT DESCRIPTION

- PRW OF CE/BECHTEL DESIGN
- 2530 MWt - 2 LOOPS - 2 STEAM GENERATORS
- PRESTRESSED CONCRETE CONTAINMENT DESIGNED TO 55 PSIG AND 283 DEG F INTERNAL PRESSURE/TEMPERATURE
- MECHANICAL DRAFT COOLING TOWERS
- LOCATED ON EASTERN SHORE OF LAKE MICHIGAN NEAR SOUTH HAVEN, MI

PALISADES POL/FTOL CONVERSION

BACKGROUND

- CP ISSUED MARCH 14, 1967

- POL ISSUED MARCH 24, 1971 TO EXPIRE MARCH 1, 1974
  (ALLOW AN INTERIM PERIOD OF ROUTINE OPERATION)

- FTOL CONVERSION APPLICATION JANUARY 22, 1974
  (ALSO REQUESTED POWER INCREASE IN CONFORMANCE WITH 10CFR2.109)

- STAFF REVIEW OF LICENSE CONVERSION STOPPED IN 1975
  - LARGE NUMBER OF UNRESOLVED GENERIC ISSUES
  - ESTABLISH APPROPRIATE SCOPE OF REVIEW

- SUBSUMED INTO SYSTEMATIC EVALUATION PROGRAM IN 1977
  - STAFF RECOMMENDATION
  - SIMILAR SCOPE OF SEP AND POL CONVERSION

- SEP RESULTS DOCUMENTED IN INTEGRATED PLANT SAFETY ASSESSMENT REPORT (NUREG-0820) AND SUPPLEMENT (NUREG-0820 SUPPLEMENT 1)

PALISADES POL/FTOL CONVERSION

HIGHLIGHTS OF OPERATING HISTORY

o MARCH 14, 1967	CP ISSUED
o MARCH 24, 1971	POL ISSUED
o JANUARY 22, 1974	FULL TERM LICENSE APPLICATION REQUESTED POWER INCREASE TO 2638 MWt (DENIED DUE TO SG PROBLEMS)
o NOVEMBER 1, 1977	NRC GRANTS POWER INCREASE TO 2530 MWt BASED ON REANALYSIS AND SG IMPROVEMENTS
o JULY 24, 1987	CAPACITY OF SPENT FUEL POOL INCREASED FROM 798 TO 892 FUEL ASSEMBLIES
o FALL 1990	STEAM GENERATOR REPLACEMENT PROJECT

PALISADES POL/FTOL CONVERSION

SYSTEMATIC EVALUATION PROGRAM

- o NRC INITIATED EFFORT IN 1977 WHICH PROVIDED
  - A) ASSESSMENT OF SIGNIFICANCE OF DIFFERENCES BETWEEN CURRENT POSITIONS AND THOSE HELD AT PLANT LICENSING
  - B) BASIS FOR RESOLVING DIFFERENCES IN AN INTEGRATED REVIEW

- o 137 TOPICS IDENTIFIED FOR REVIEW

  47 DELETED (USI, TMI, NOT APPLICABLE)

- o 90 TOPICS REVIEWED FOR PALISADES
  - 59 MET CURRENT CRITERIA
  - 31 PLANT DESIGN DIFFERENCES

- o RESULTS OF STAFF REVIEW PROVIDED IN
  - NUREG-0820 OCTOBER 1982
  - NUREG-0820 SUPPLEMENT 1 NOVEMBER 1983

- o ALL BUT THREE ISSUES CLOSED IN THESE DOCUMENTS

PALISADES POL/FTOL CONVERSION

SYSTEMATIC EVALUATION PROGRAM

1) TOPIC III-5A EFFECTS OF PIPE BREAKS INSIDE CONTAINMENT

- o CLOSED BY SER ISSUED FEBRUARY 4, 1987

2) TOPIC III-6 SEISMIC DESIGN ISSUES - ADEQUACY OF DESIGN OF CERTAIN STRUCTURES TO WITHSTAND SEISMIC MOTION

- o 4 OF 6 OPEN ISSUES ADDRESSED AND RESOLVED BY SER DATED AUGUST 31, 1990. REMAINING 2 ISSUES UNDER STAFF REVIEW.

3) TOPIC III-7B DESIGN CODES AND STANDARDS - EXTENT OF PALISADES CONFORMANCE TO REVISED DESIGN CODES AND STANDARDS

- o ONE ISSUE REMAINING - EXTREME SNOW LOADING ON ROOF OF SPENT FUEL BUILDING

PALISADES POL/FTOL CONVERSION

UNRESOLVED SAFETY ISSUES

- o STATUS OF USIs WAS ADDRESSED IN THE STAFF REVIEW OF RESPONSES TO GENERIC LETTER 89-21
- o RESULTS WERE PRESENTED TO THE COMMISSION AT A MEETING ON FEBRUARY 14, 1990
- o 6 OF 12 USIs WHICH ARE APPLICABLE TO PALISADES ARE CURRENTLY UNIMPLEMENTED

PALISADES POL/FTOL CONVERSION

UNIMPLEMENTED USIs

USI #	TITLE	STATUS
A-9	ATWS 10CFR50.62	MODS TO BE COMPLETED DURING 1990 REFUELING OUTAGE
A-11	REACTOR VESSEL MATERIAL TOUGHNESS	ALTERNATIVE APPROACH UNDER STAFF REVIEW (USING ACCELERATED IRRADIATED SPECIMENS)
A-44	STATION BLACKOUT	SER PENDING
A-46	SEISMIC QUALIFICATION OF EQUIPMENT	IMPLEMENTATION UNDER SQUG GUIDELINES
A-47	SAFETY IMPLICATIONS OF CONTROL SYSTEMS	CE OWNERS GROUP RESPONSE UNDER REVIEW
A-49	PRESSURIZED THERMAL SHOCK	ANALYSIS OF EFFECT OF FLUX REDUCTION UNDER STAFF REVIEW

NRR STAFF PRESENTATION TO THE

ACRS

SUBJECT: CONVERSION OF PALISADES PROVISIONAL OPERATING LICENSE TO FULL TERM OPERATING LICENSE

DATE: DECEMBER 5-7, 1990

PRESENTER: BRIAN HOLIAN

PRESENTER'S TITLE/BRANCH/DIV: PROJECT MANAGER/PD III-1/DIVISION OF REACTOR AND SPECIAL PROJECTS

PRESENTER'S NRC TELEPHONE NO: 492-1344

PALISADES POL/FTOL CONVERSION

PLANT SPECIFIC ACTIVITIES

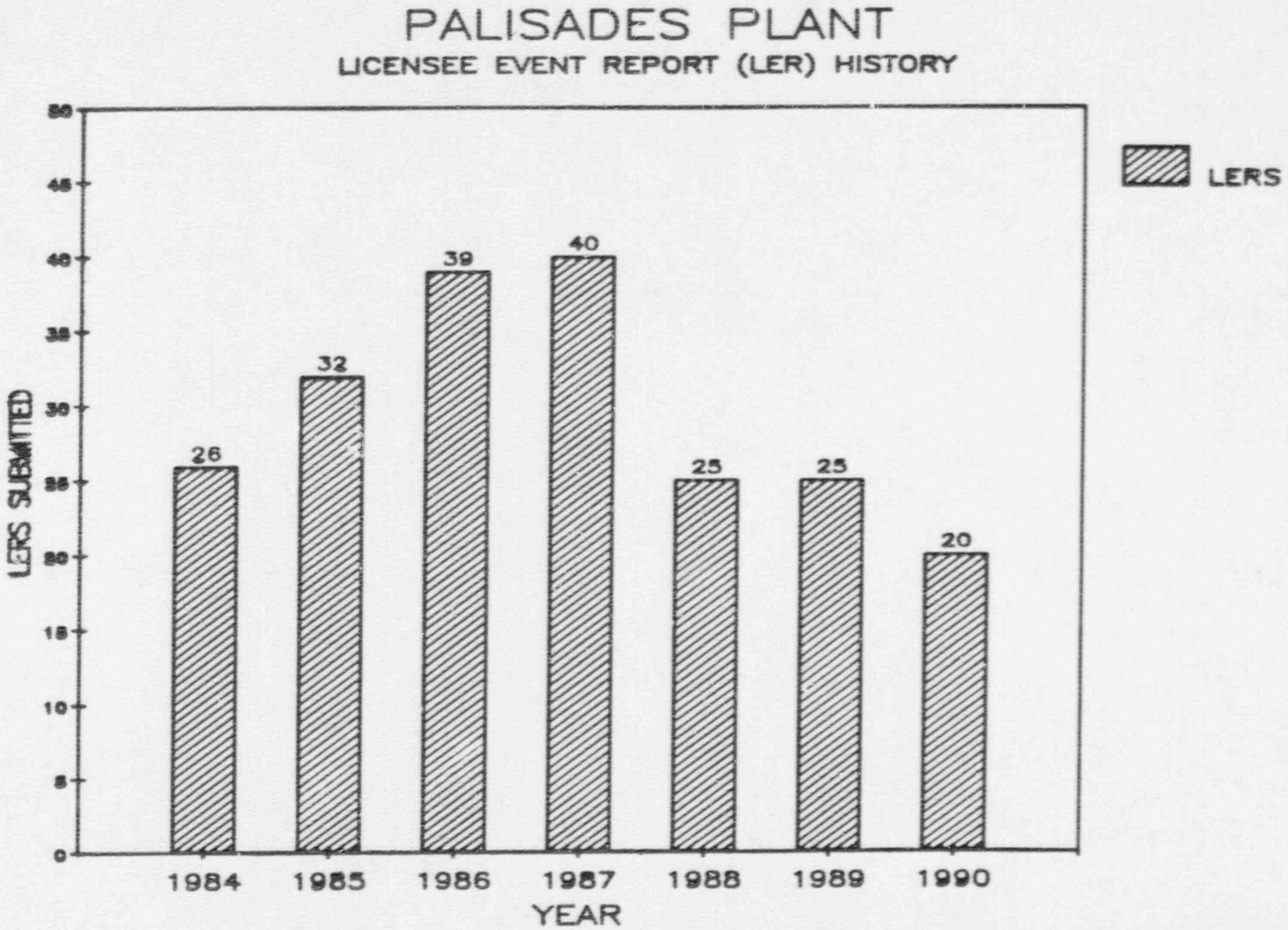
- o STEAM GENERATOR REPLACEMENT
  - UNDER 50.59 ANALYSIS
  - CONTAINMENT OPENING
  - NARROW GAP WELDING
  - PIPING MODIFICATIONS
  - TRANSIENT AND ACCIDENT ANALYSIS (MSLB, SG TUBE RUPTURE)
  - STEAM GENERATOR STORAGE

- o TRANSFER OF PLANT OWNERSHIP
  - FORMATION OF PALISADES GENERATING COMPANY

    CONSUMERS POWER COMPANY (44%)

    BECHTEL (33%)

    WESTINGHOUSE (23%)


PALISADES PLANT
LICENSEE EVENT REPORT (LER) HISTORY
LERS SUBMITTED
50
45
40
35
30
25
20
15
10
5
0
26
32
39
40
25
25
20
1984
1985
1986
1987
1988
1989
1990
YEAR
LERS

PALISADES SALP RATINGS

SALP	PERIOD	OPERATIONS	RADIOLOGICAL CONTROLS	MAINTENANCE	EMERGENCY PREPAREDNESS	SECURITY	E/TS	SA/QV
5	10/31/84	2	2	2	2	2	N	N
6	10/31/85	2	2	3	2	2	N	N
7	04/30/87	2	2	3	2	2	N	N
8	05/31/88	2 ↑	2	2	1	1	2	N
9	08/31/89	2 ↑	2	2 ↑	1	1	2	2

CONSUMERS POWER COMPANY

PALISADES PLANT

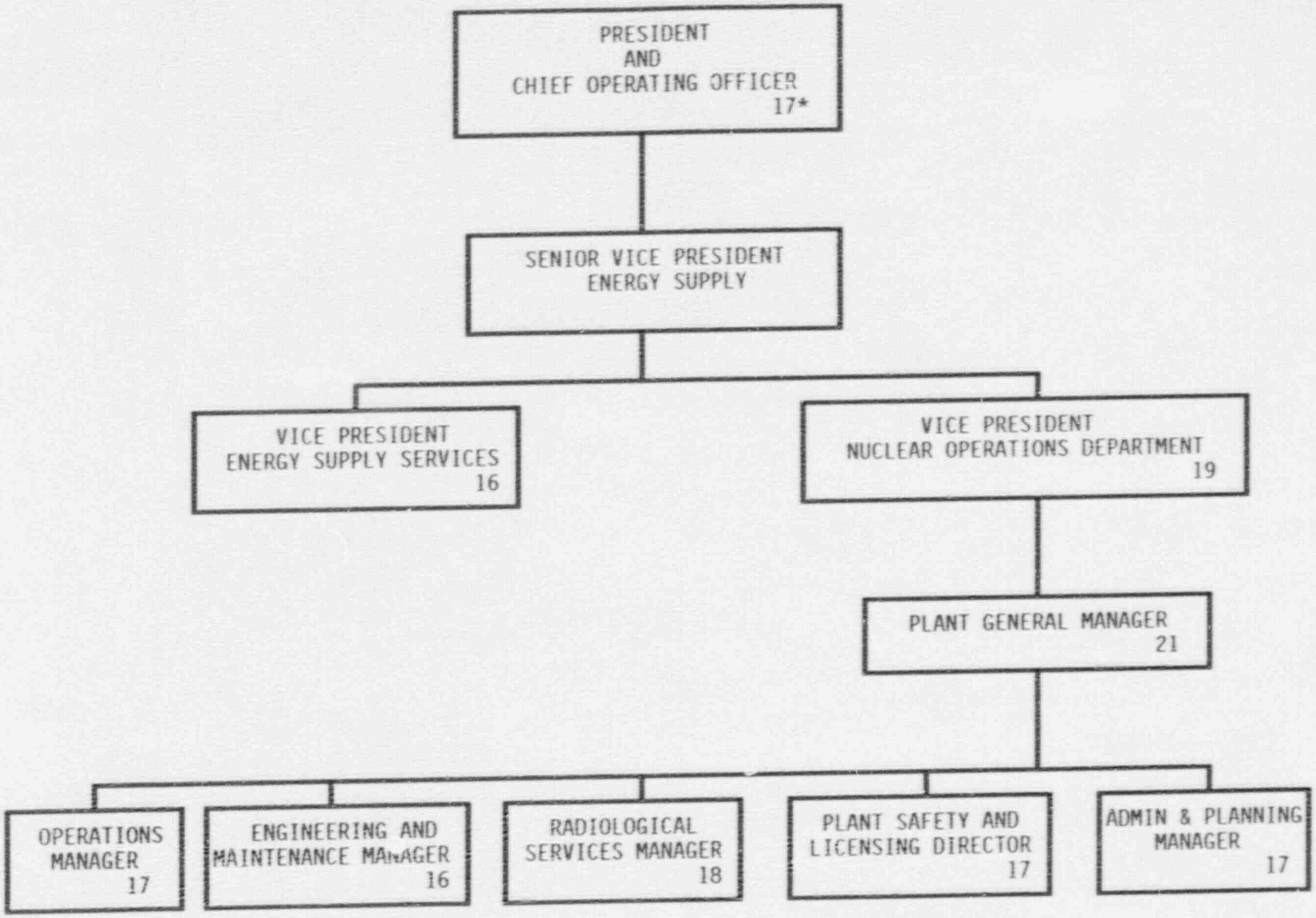
ACRS MEETING ON
FULL TERM OPERATING LICENSE

DAVID J VANDEWALLE
PALISADES SAFETY & LICENSING DIRECTOR
DECEMBER 5 AND 6, 1990

ACRS MEETING ON PALISADES
FULL TERM OPERATING LICENSE

- Consumers Power Company Nuclear Organization
- Plant Mission
- Plant Operating History
- Major Modifications
- Steam Generator Replacement Outage Status

CONSUMERS POWER COMPANY



*Years of Nuclear Experience

CONSUMERS POWER COMPANY

AT THE PALISADES PLANT OUR MISSION IS TO PROVIDE SAFE, RELIABLE AND COST-EFFECTIVE POWER SO THAT WE BECOME RECOGNIZED AS ONE OF THE TOP TEN NUCLEAR PLANTS IN THE UNITED STATES.

KEY PERFORMANCE AREAS:

- SAFETY - NUCLEAR, INDUSTRIAL, RADIOLOGICAL, ENVIRONMENTAL
- RELIABILITY
- ECONOMIC
- REGULATORY
- PEOPLE

OPERATING HISTORY

1971	COMMERCIAL OPERATION
1974	ADDITION OF COOLING TOWERS
1977	POWER INCREASE TO 2530 MWT
1978-1985	SYSTEMATIC EVALUATION PROGRAM
	PERIOD OF UNDISTINGUISHED PERFORMANCE
1986	MAY 19, 1986 REACTOR TRIP AND CONFIRMATORY ACTION LETTER
	- MATERIAL CONDITION TASK FORCE
	- SYSTEM FUNCTIONAL EVALUATION
	- CONFIGURATION CONTROL PROJECT
1987	RETURN TO OPERATION
1988-1989	IMPROVING OPERATIONAL PERFORMANCE
	DECISION TO REPLACE STEAM GENERATORS
1990	STEAM GENERATOR REPLACEMENT

MAJOR MODIFICATIONS
SINCE SEP

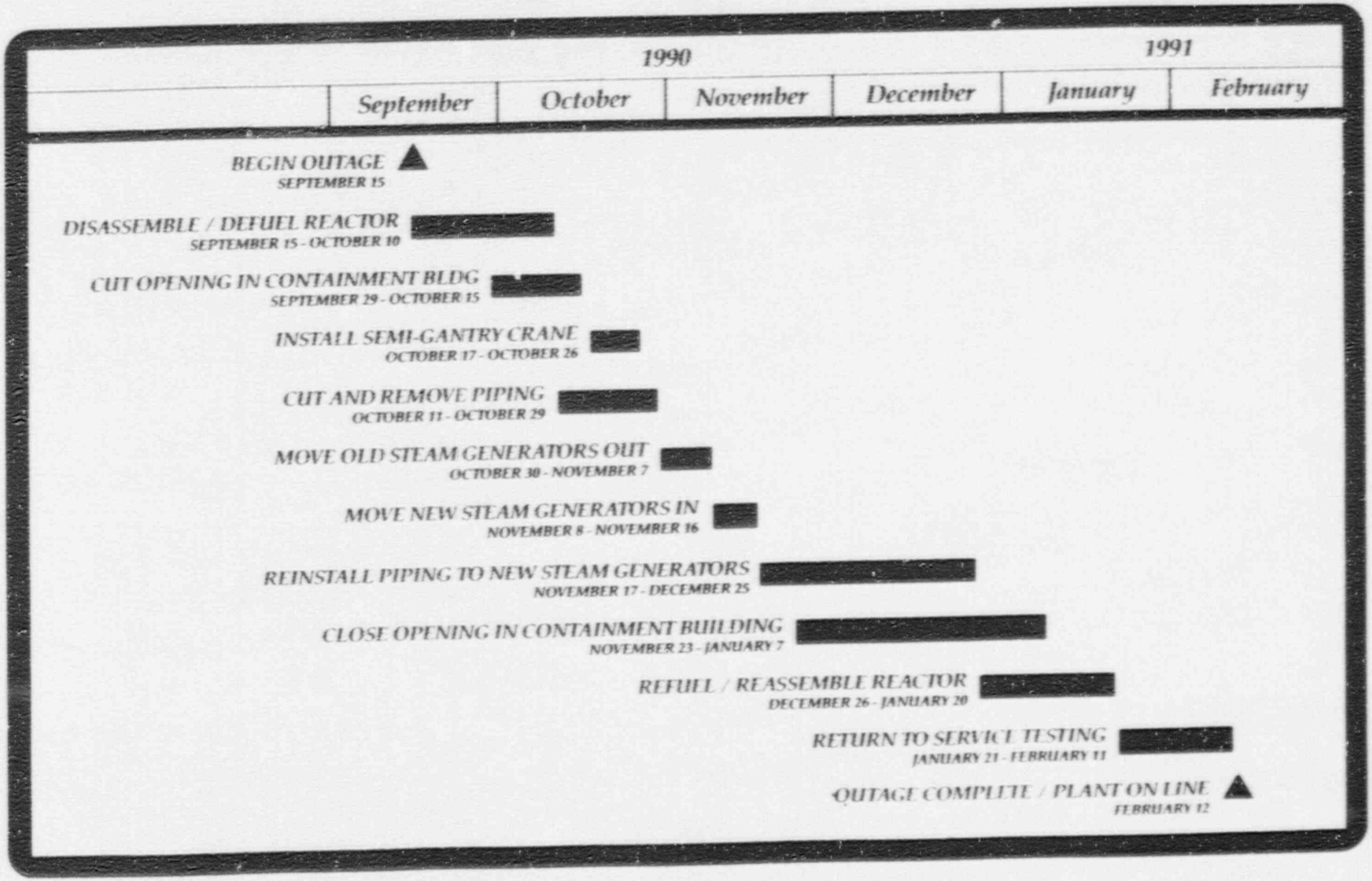
- Auxiliary Feedwater
- Offsite Power
- Pressurizer PORVs and Block Valves
- ATWS
- Instrumentation for System Performance Testing
- Secondary System Improvements

Consumers Power

POWERING MICHIGAN'S PROGRESS

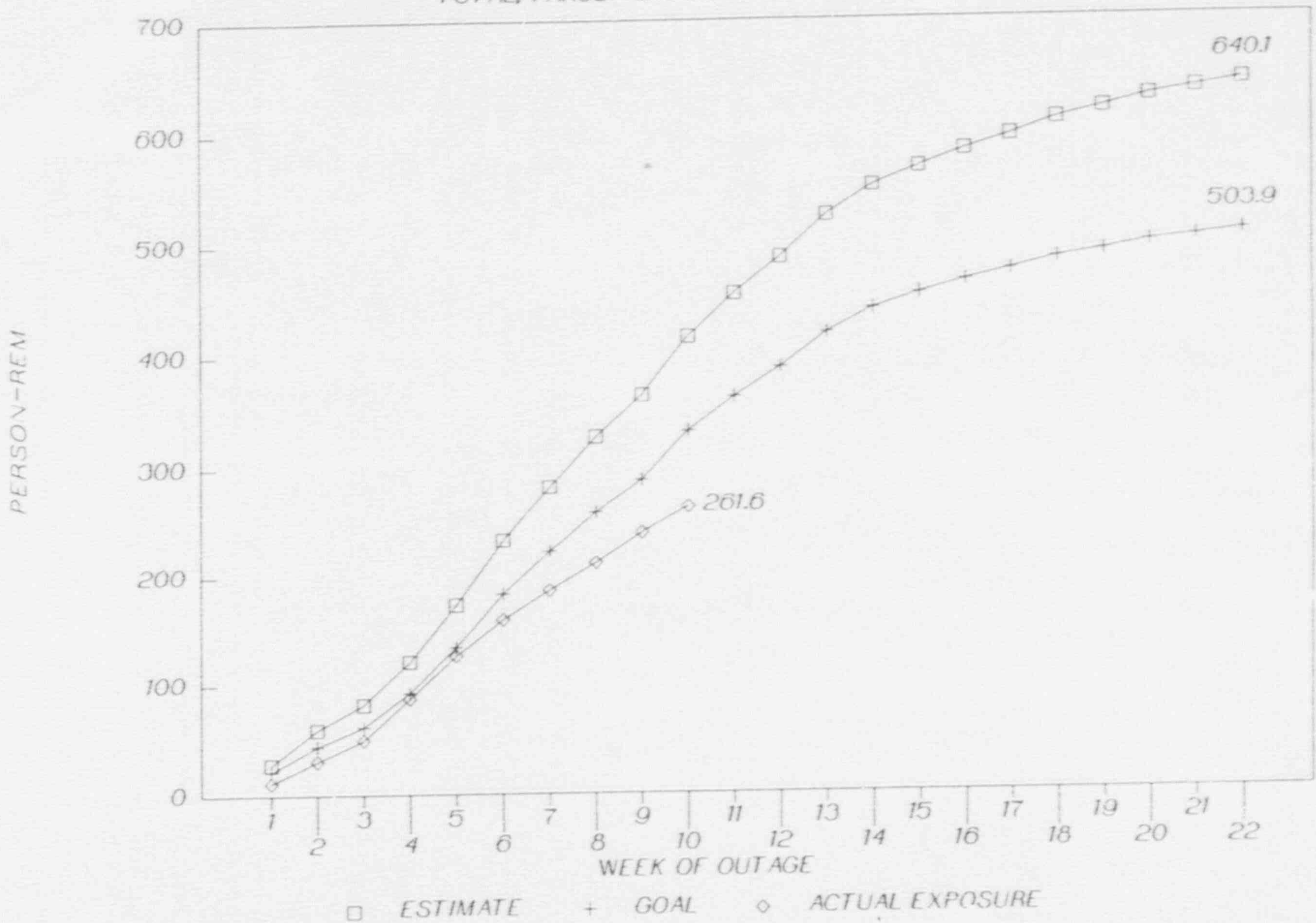
Palisades Nuclear Plant
Steam Generator Replacement Project

PALISADES SGRP

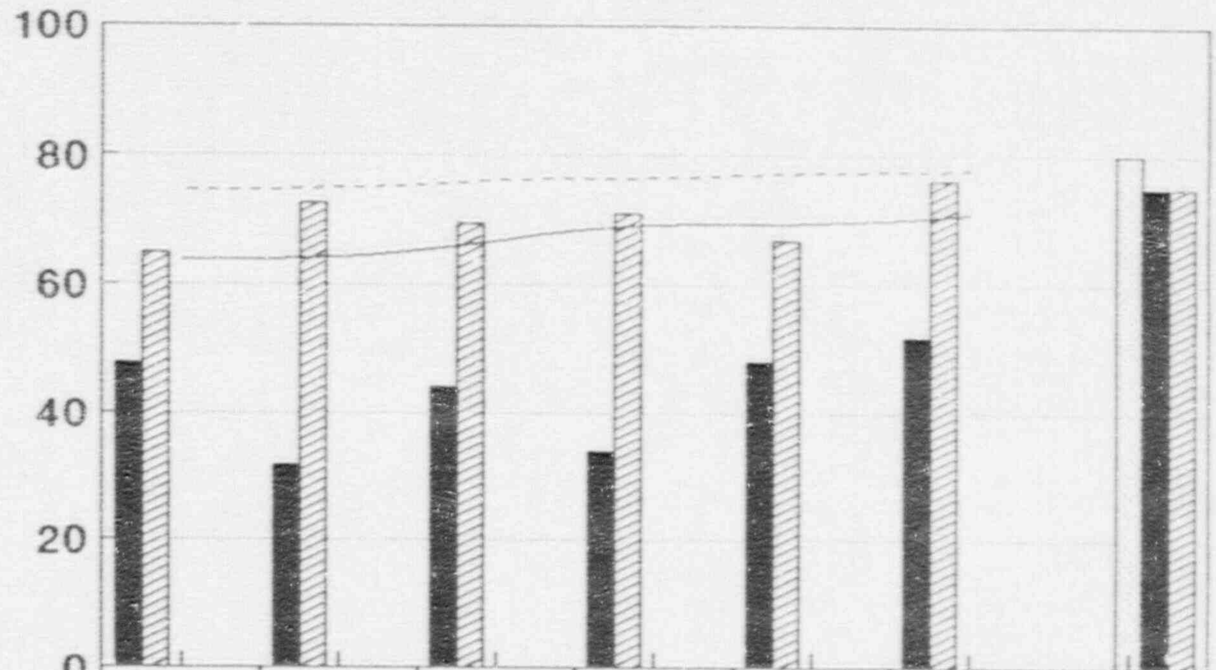


SGRP - FALL 1990

TOTAL, TARGET and ESTIMATED EXPOSURE



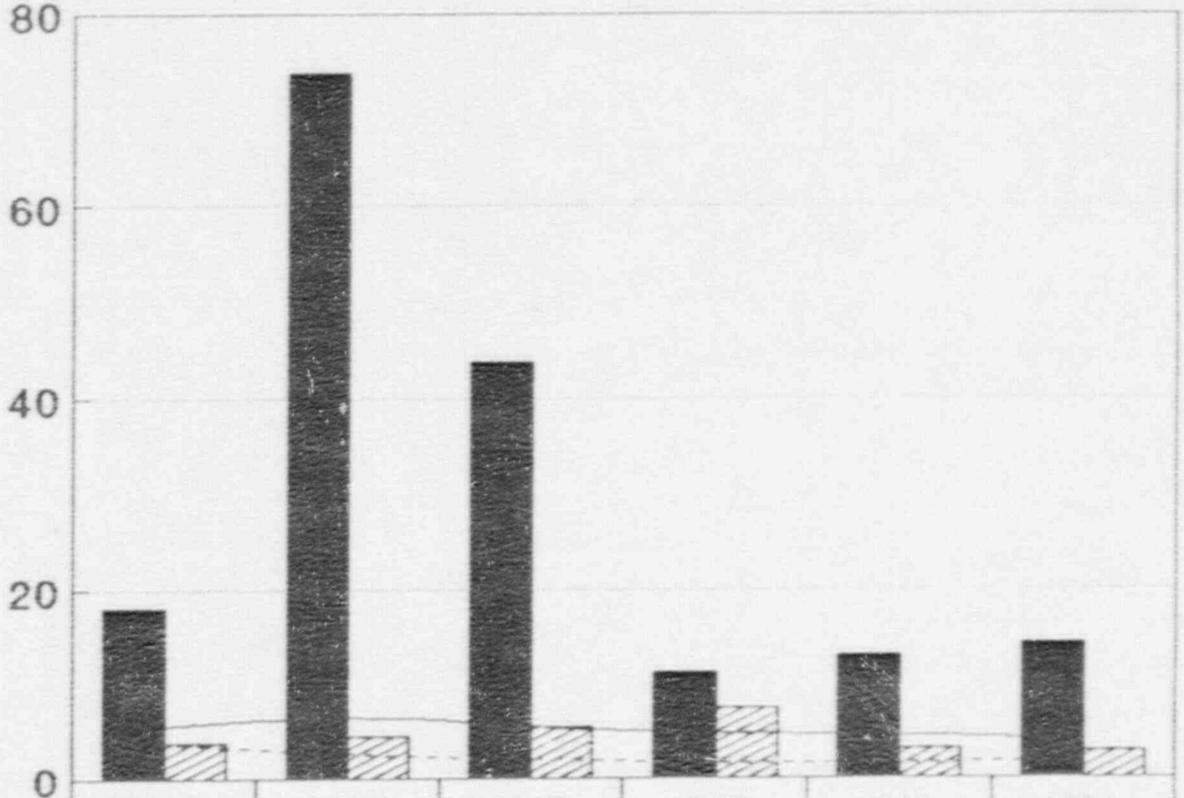
UNIT AVAILABILITY



		1985	1986	1987	1988	1989	1990	1995
PAL	■	47.7	31.6	43.9	34	47.8	51.7	
BRP	▨	64.8	72.6	69.3	70.9	66.3	76.3	
INDUSTRY MEDIAN	—	63.7	63.4	66.7	70.1	69	70.9	
BEST QUARTILE	- - -	74.6	74.6	76.6	76.2	77.6	77.8	
1995 INPO GOAL	░							80
1995 PAL GOAL	■							75
1995 BRP GOAL	▨							75

Equivalent Availability Factor (unit%)
1990 Data is thru June 1990
Data is a three year average 7/87-6/90

FORCED OUTAGE RATE



		1985	1986	1987	1988	1989	1990
PAL		18.1	73.9	43.8	11.3	13	14.3
BRP		3.8	4.6	5.5	7.5	3.1	2.8
INDUSTRY MEDIAN	——	5.6	7.2	5.3	4.7	4.6	4.1
BEST QUARTILE	- - -	3.8	2.4	2.2	1.5	1.6	1.9

Unit Percent
1990 data is thru June 1990
No 1995 Goals Established

NRR STAFF PRESENTATION TO THE ACRS

SUBJECT: DRESDEN 2 - POL TO FTOL CONVERSION

DATE: DECEMBER 6, 1990

PRESENTER: BYRON SIEGEL

PRESENTER'S TITLE/BRANCH/DIV: SENIOR PROJECT MANAGER/PDIII-2/
DIVISION OF REACTOR PROJECTS III/IV/V

PRESENTER'S NRC TEL. NO.: 492-3019

SUBCOMMITTEE:

ACRS PRESENTATION RELATED TO THE

DRESDEN 2 AND PALISADES POL TO FTOL CONVERSION

JOHN A. ZWOLINSKI - ASSISTANT DIRECTOR FOR REGION III REACTORS

RICHARD J. BARRETT - PROJECT DIRECTOR, PDIII-2 (DRESDEN)

JOHN F. STANG - ACTING PROJECT DIRECTOR, PDIII-1 (PALISADES)

BYRON L. SIEGEL - SENIOR PROJECT MANAGER, DRESDEN

BRIAN E. HOLIAN - PROJECT MANAGER, PALISADES

ARMANDO S. MASCIANTONIO - PROJECT MANAGER, PALISADES FTOL CONVERSION

BARRY J. ELLIOTT - TECHNICAL STAFF REVIEWER

POL TO FTOL CONVERSION HISTORY

- AEC ISSUED 15 PROVISIONAL OPERATING LICENSES (POLs)
- RULE CHANGE IN 1970 WHICH DELETED FROM REGULATIONS ISSUANCE OF POLs
- NO PROVISION IN RULE CHANGE FOR CONVERTING POLs
- PURSUANT TO 10 CFR 2.109 POL NOT EXPIRED IF LICENSEE FILED APPLICATION AT LEAST 30 DAYS PRIOR TO EXPIRATION DATE
- CECo FILED APPLICATION FOR CONVERSION OF DRESDEN 2 (D2) TO FULL TERM OPERATING LICENSE ON 11/15/72 (POL EXPIRED 12/22/72)
- 1975 - STAFF STOPPED REVIEW OF CONVERSIONS DUE TO BACKLOG OF UNRESOLVED GSIs RELEVANT TO POL PLANTS
- 1977 - COMMISSION ADOPTED STAFF RECOMMENDATION THAT POL FACILITIES BE INCLUDED IN PHASE II OF SEP.
- FEB. 1983 - ISSUANCE OF SEP REPORT FOR D2 (IPSAR-NUREG-0823)
- OCT. 1989 - ISSUANCE OF SUPPLEMENT 1 TO SEP REPORT FOR D2
- JUNE 1990 - ISSUANCE OF ENVIRONMENTAL ASSESSMENT FOR D2
- SEPT. 1990 - ISSUANCE OF SER TO SUPPORT CONVERSION FOR D2 (NUREG-1403)

NOTE - DRESDEN 2 IS IDENTICAL TO DRESDEN 3 WHICH HAS A FTOL BECAUSE LICENSE WAS ISSUED AFTER RULE CHANGE.

DRESDEN 2 PLANT INFORMATION

LICENSEE	COMMONWEALTH EDISON COMPANY
LOCATION	GRUNDY COUNTY, ILLINOIS
COMMERCIAL OPERATION	JUNE 1970
NSSS VENDOR	GE
REACTOR TYPE	BWR-3
POWER (MWT)	2527
(MWE)	772
CONSTRUCTOR	UNITED ENGINEERS AND CONSTRUCTORS
ARCHITECT-ENGINEER	SARGENT AND LUNDY
CONTAINMENT TYPE	MARK 1 - STEEL DRYWELL AND WETWELL
SIMILAR PLANTS	MILLSTONE 1, PILGRIM, QUAD CITIES, MONTICELLO

SAFETY EVALUATION REPORT (SER)

ADDRESSES

- TMI OPEN ISSUES
- SEP OPEN ISSUES
- SIGNIFICANT OPEN ISSUES
- UNRESOLVED SAFETY ISSUES

DOES NOT ADDRESS

- FACILITY IMPROVEMENTS AND MODIFICATIONS
- LICENSE AND TS AMENDMENTS APPROVED BY STAFF
- ALL CLOSED ISSUES (IE. TMI, USIs, SEP TOPICS)

TMI OPEN ISSUES

1.D.1.1 DETAILED CONTROL ROOM DESIGN REVIEW - ANNUNCIATOR MODIFICATIONS (CATEGORY 2 LEVEL B OR C, MINIMAL SAFETY SIGNIFICANCE)

II.F.2.4 INSTRUMENTATION FOR DETECTION OF INADEQUATE CORE COOLING - MODIFICATION OF EXISTING INSTRUMENTATION (REROUTING OF THE REACTOR WATER REFERENCE LEG FOR LEVEL DETERMINATION)

III.A.2.2 UPGRADE EMERGENCY PREPAREDNESS - METEOROLOGICAL DATA (UTILIZATION OF IMPROVED MODEL FOR CALCULATING METEOROLOGICAL DATA)

RG. 1.97 POST ACCIDENT MONITORING INSTRUMENTATION - INSTALLATION OF NEUTRON FLUX MONITORING INSTRUMENTATION THAT MEETS THE REQUIREMENTS OF RG 1.97 AND 10 CFR 50.49

SEP OPEN ISSUES

TOPIC III-1 CLASSIFICATION OF STRUCTURES, COMPONENTS AND SYSTEMS - LICENSEE PROVIDED SUPPLEMENTAL INFORMATION ON LPCI HEAT EXCHANGER LOWEST SERVICE TEMPERATURE, STAFF PREPARING SE WHICH FINDS HEAT EXCHANGER HAS ADEQUATE FRACTURE TOUGHNESS TO MEET ASME CODE REQUIREMENTS

TOPIC III-6 SEISMIC DESIGN CONSIDERATIONS - STAFF REVIEWING THE STRUCTURAL INTEGRITY OF REACTOR VESSEL AND INTERNAL SUPPORTS TO WITHSTAND SEISMIC EVENTS

TOPIC III-7.B DESIGN CODES, DESIGN CRITERIA, LOAD COMBINATIONS, AND REACTOR CAVITY DESIGN CRITERIA - STAFF ISSUED SER 8/23/90 CLOSING THIS ISSUE

SIGNIFICANT OPEN ITEMS

INTERGRANULAR STRESS CORROSION CRACKING - LICENSEE'S IGSCC INSPECTION AND MITIGATION PROGRAM IN RESPONSE TO GL 88-01 FOUND ACCEPTABLE, SE ISSUED 8/23/90

CONTROL ROOM HABITABILITY - TS AMENDMENT RELATED TO INSTALLATION OF A NEW CONTROL ROOM EMERGENCY AIR FILTERATION SYSTEM HAS BEEN SUBMITTED AND IS UNDER STAFF REVIEW

COMBUSTIBLE GAS CONTROL - 10 CFR 50.44 (DISCUSSED UNDER USI'S)

STATION BLACKOUT - 10 CFR 50.63 (DISCUSSED UNDER USI'S)

HARDENED WETWELL VENT - GL 89-16 - STAFF ISSUED LETTER ON 9/24/90 CONFIRMING LICENSEE'S COMMITMENT TO INSTALL VENTS AS PER GL 89-16

UNRESOLVED SAFETY ISSUES

ATWS(A-09) - DIVERSITY ISSUE ASSOCIATED WITH ARI AND RPT ANALOG TRIP UNITS - EDO AGREES WITH STAFF BWROG APPEAL DENIED

STATION BLACKOUT (A-44) - LICENSEES RESPONSE REVIEWED AND APPROVED BY THE STAFF - FOURTH DIESEL GENERATOR TO BE INSTALLED

SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS (A-46) SPECIFIC REQUIREMENTS AND APPROACH FOR IMPLEMENTATION BEING DEVELOPED JOINTLY BY THE STAFF AND THE SEISMIC QUALIFICATION UTILITY GROUP

SAFETY IMPLICATIONS OF CONTROL SYSTE[illegible]-47) - LICENSEES SUBMITTAL UNDER STAFF REVIEW

HYDROGEN CONTROL (A-48) - STAFF HAS DETERMINED LICENSEE DOES NOT SATISFY REQUIREMENTS OF 10 CFR 50.44 - MEETING TO BE HELD WITH LICENSEE IN JANUARY TO OBTAIN RESOLUTION

CONCLUSIONS

- APPLICATION FOR FTOL FOR D2 COMPLIES WITH THE COMMISSIONS REGULATIONS (EXCEPT AS DULY EXEMPTED) AND PROVISIONS OF ATOMIC ENERGY ACT.
- AN ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT HAS BEEN PREPARED AND PUBLISHED.
- REASONABLE ASSURANCE THAT THE ACTIVITIES AUTHORIZED BY THE FTOL CAN BE CONDUCTED WITHOUT ENDANGERING THE HEALTH AND SAFETY OF THE PUBLIC AND THAT SUCH ACTIVITIES WILL BE CONDUCTED IN COMPLIANCE WITH COMMISSION REGULATIONS.
- LICENSEE IS TECHNICALLY QUALIFIED TO ENGAGE IN ACTIVITIES AUTHORIZED BY FTOL.
- ISSUANCE OF THE FTOL WILL NOT BE INIMICAL TO THE COMMON DEFENSE AND SECURITY OR THE HEALTH AND SAFETY OF THE PUBLIC.
- D-3, WHICH IS AN IDENTICAL PLANT HAS BEEN ISSUED AN FTOL.
- D-2 HAS 20 YEARS OF SUCCESSFUL OPERATING EXPERIENCE
- FTOL FOR DRESDEN 2 SHOULD BE AUTHORIZED BY THE NRC

DRESDEN OPERATION HISTORY

DRESDEN PUT ON COMMISSION WATCH LIST IN 1987 AS A RESULT OF SSOMI, DET, MANY SCRAMS, POOR RADIATION PROTECTION PRACTICES, POOR MAINTENANCE

DRESDEN IN 1986 INITIATED MANAGEMENT CHANGES, MANY IMPROVEMENT PROGRAMS, INCLUDING MAINTENANCE, DIRECTED AT PLANT SAFETY AND PERFORMANCE

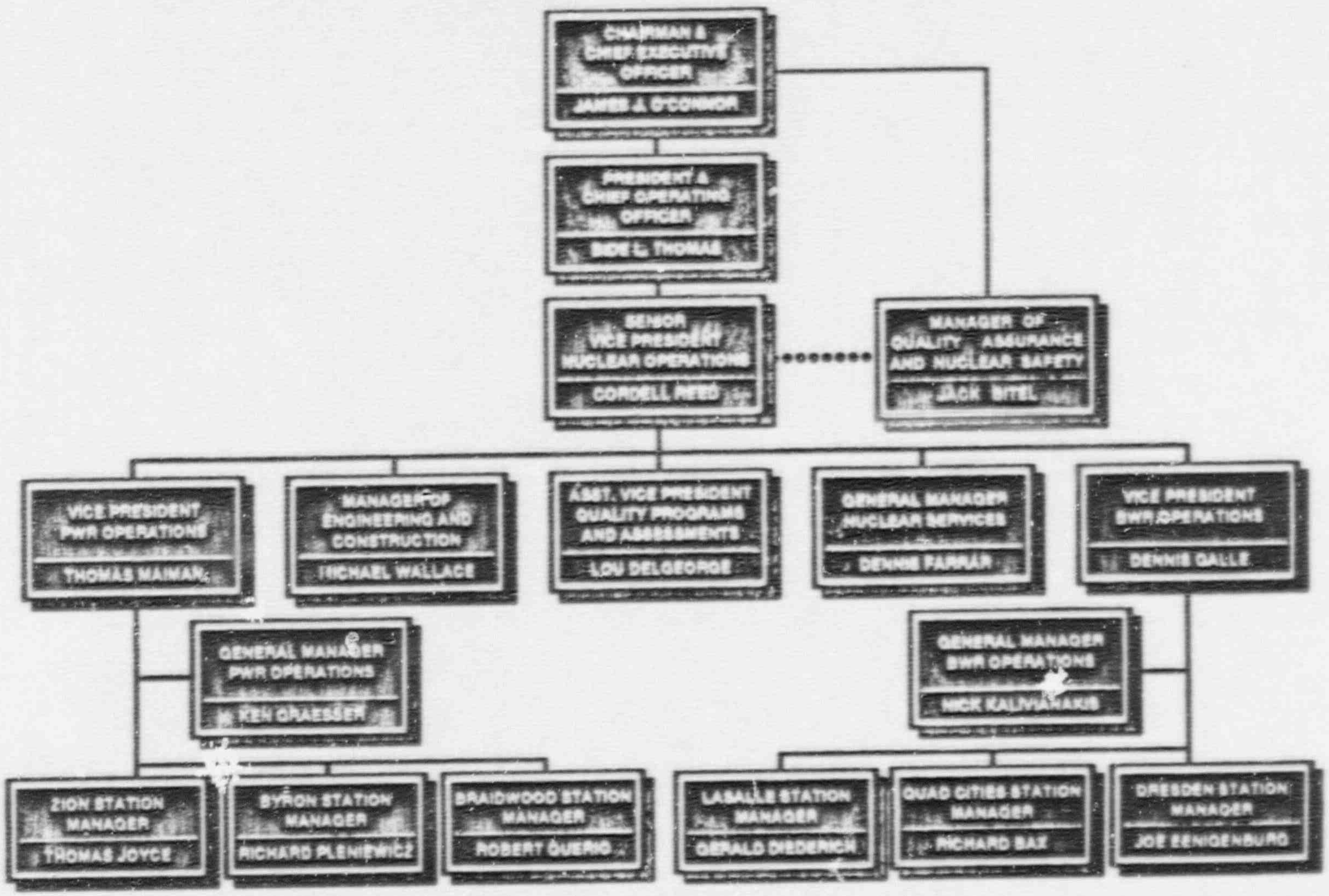
PRIOR TO 1986 DRESDEN WAS AN AVERAGE PERFORMING PLANT WITH UPS AND DOWNS, DID NOT SUSTAIN CONTINUED GOOD PERFORMANCE

SINCE OCTOBER 1987 DRESDEN HAS DEMONSTRATED SUSTAINED GOOD PLANT PERFORMANCE. THE NUMBER OF SCRAMS, ESF ACTUATIONS, HUMAN ERRORS HAVE BEEN SIGNIFICANTLY REDUCED AS A RESULT OF IMPROVEMENT PROGRAMS AND MANAGEMENT INVOLVEMENT

SALP RATINGS DURING THIS TIME PERIOD HAVE BEEN:

SALP NO.	1	2	3
6 (1986)	1	8	2
7 (1988)	0	9	1
8 (1989)	2	5	0
9 (1990)	3	4	0

Nuclear Operations



RETHINKING HIGH-LEVEL RADIOACTIVE WASTE DISPOSAL

A Position Statement

of the Board on Radioactive Waste Management

Commission on Geosciences, Environment, and Resources
National Research Council

NATIONAL ACADEMY PRESS
Washington, D.C. July 1990

6

HLW REPOSITORY PERFORMANCE CRITERIA

COUNTRY	CRITERION	COMMENTS
BELGIUM	NO DECISION	ID WILL PROBABLY BE LIMITED, BASED ON ICRP
CANADA	NO DECISION	ID WILL PROBABLY BE LIMITED TO FRACTION OF BACKGROUND
FRG	ID OF 0.3	THERE EXIST FUEL CYCLE DEADLINES. DE MINIMIS VALUE OF 1-10 μSv CONSIDERED
FRANCE	NO DECISION	ID WILL PROBABLY BE LIMITED, BASED ON ICRP
JAPAN	NO DECISION	ID LIMIT OF 0.05 CONSIDERED
SWEDEN	ID OF 0.1	FUTURE OF NUCLEAR POWER TIED LEGALLY TO SOLUTION OF WASTE DISPOSAL
SWITZERLAND	ID OF 0.1	FUTURE OF NUCLEAR POWER TIED LEGALLY TO SOLUTION OF WASTE DISPOSAL
UK	NO DECISION	ID OF 1 FOR ALL SOURCES. NO DECISION ON FRACTION FOR REPOSITORY. RISK TARGET OF 10^{-6} YR^{-1}, CORRESPONDING TO ID OF 0.1 PROPOSED FOR REPOSITORY
USA	CD OF 1000 DEATHS IN 10,000 YEARS	CDs TRANSLATED INTO RADIONUCLIDE LIMITS VIA CODES FOR GENERIC SITES. CRITERIA FOR EACH BARRIER.

ID=INDIVIDUAL DOSE; CD=COLLECTIVE DOSE; IDs IN mSv YR^{-1}

MODELING

COMPARE REALISTIC ALTERNATIVES -
NOT A DEBATE ON ABSOLUTE SAFETY

EQUITY

LABOR

LEGACY

LOCUS

ETHICS

NEED FOR REPOSITORY

SITING

INTERGOVERNMENTAL SHARING
OF POWER

SAFETY

IMPACTS

ALTERNATIVE APPROACH

IDENTIFY LARGEST & MOST SIGNIFICANT UNCERTAINTIES
(ITERATIVE PERFORMANCE ASSESSMENT)

MEET PROBLEMS AS THEY EMERGE
(FIXING PROBLEMS VS ANTICIPATING PROBLEMS)

PERFORMANCE NOT REQUIREMENTS DRIVEN
(DEFINE THE PROBLEM BROADLY)

IMPERFECT REALITY VS IDEAL SYSTEM

EQUITY

LABOR

LEGACY

LOCUS

ETHICS

NEED FOR REPOSITORY

SITING

INTERGOVERNMENTAL SHARING OF POWER

SAFETY

IMPACTS

MODELING

CONFIDENCE IN DISPOSAL:

REMOTENESS

ENGINEERING DESIGN

MATHEMATICAL MODELLING

PERFORMANCE ASSESSMENT

NATURAL ANALOGUES

REMEDIATION POSSIBILITIES

EXPERT OPINION

ALTERNATIVE APPROACH

IDENTIFY LARGEST & MOST SIGNIFICANT UNCERTAINTIES
(ITERATIVE PERFORMANCE ASSESSMENT)

MEET PROBLEMS AS THEY EMERGE
(FIXING PROBLEMS VS ANTICIPATING PROBLEMS)

PERFORMANCE NOT REQUIREMENTS DRIVEN
(DEFINE THE PROBLEM BROADLY)

IMPERFECT REALITY VS IDEAL SYSTEM

NRR STAFF PRESENTATION TO THE ACRS
STANDARDIZATION AND PART 52 LICENSING

DECEMBER 6, 1990

M. VIRGILIO, ASSISTANT DIRECTOR

REACTOR PROJECTS, NRR

301-492-1353

G. IMBRO, SECTION CHIEF

SPECIAL PROJECTS BRANCH, NRR

301-492-0954

1

OVERVIEW

* GRADED APPROACH TO DESIGN FINALITY
* CONTENT OF THE APPLICATION AND CERTIFICATION
* CHANGE PROCESS FOR MATERIAL IN APPLICATION, CERTIFICATION AND HELD FOR AUDIT

2

SECY 90-241

- CONTENTS OF THE APPLICATION
  TIER 1 & TIER 2
- CERTIFICATION - TIER 1
- MATERIAL AVAILABLE FOR AUDIT
- LEVELS 1, 2, 3, & 4

FOUR LEVELS FROM SECCY 90-241

- 1. IDENTICAL PHYSICAL, FUNCTIONAL & PERFORMANCE CHARACTERISTICS
- 2. PHYSICALLY SIMILAR / IDENTICAL FUNCTIONAL & PERFORMANCE CHARACTERISTICS
- 3. IDENTICAL FUNCTIONAL & PERFORMANCE CHARACTERISTICS
- 4. FUNCTIONALLY IDENTICAL / SIMILAR PRINCIPAL FEATURES

STAFF PROPOSAL - DETAIL

- LEVEL OF DESIGN DETAIL
  * GRADED APPROACH BASED ON SAFETY
- APPLICATION
  * FSAR MINUS AS-BUILT & SITE INFORMATION
  * ORGANIZED INTO TWO PARTS/TIERS
  * SUPPORTS SAFETY DETERMINATION
- AVAILABLE FOR AUDIT
  * FROM PROCUREMENT & C&I SPECS
  * CONFIRM TRANSLATION OF SAFETY CRITERIA INTO DESIGN

STAFF PROPOSAL - DETAIL

- GRADED APPROACH BASED ON SAFETY
  - \> LEVEL 2 FOR CERTAIN NUCLEAR ISLAND FEATURES
  - LEVEL 2 FOR KEY NUCLEAR ISLAND FEATURES
  - LEVEL 2 FOR KEY TURBINE ISLAND FEATURES
  - LEVEL 4 AT CERTIFICATION AND LEVEL 2 AT COL FOR SITE SPECIFIC FEATURES

6

STAFF PROPOSAL - FLEXIBILITY

- CERTIFIED PORTION OF THE DESIGN/TIER 1

  * RULEMAKING TO AMEND CERTIFICATION
  * EXEMPTION PER SECTION 52.63
  * WAIVER PER SECTION 2.758

7

STAFF PROPOSAL - FLEXIBILITY

- IN APPLICATION BUT NOT CERTIFIED/TIER 2

  * BETWEEN DESIGN CERTIFICATION AND COL

    AMENDMENT RULEMAKING, EXEMPTION, WAIVER

  * BETWEEN COL AND AUTHORIZATION TO OPERATE

    PROVISIONS PARALLELING SECTION 50.59

  * FOLLOWING AUTHORIZATION TO OPERATE

    SECTION 50.59

STAFF PROPOSAL - FLEXIBILITY

- INFORMATION AVAILABLE FOR AUDIT
  - 10 CFR PART 50, APPENDIX B
  - TIER 1 & 2
  - COST OF REDESIGN

RECOMMENDATIONS

- AGREE WITH THE GENERAL APPROACH ON:
  - GRADED APPROACH TO DESIGN FINALITY
  - CONTENT OF THE APPLICATION AND CERTIFICATION
  - CHANGE PROCESS FOR MATERIAL IN APPLICATION, CERTIFICATION AND HELD FOR AUDIT
- AUTHORIZE DEVELOPMENT OF REG. GUIDE

ECCS PUMP

CERTIFIED (TIER 1)

CODES AND STANDARDS
TYPE OF PUMP (CENTRIFUGAL, POSITIVE DISPLACEMENT)
PRIME MOVER (TURBINE-DRIVEN, MOTOR-DRIVEN)

SUBMITTED AND NOT CERTIFIED (TIER 2)

PIPING AND NOZZLE SIZES
PRESSURE, TEMPERATURE, STEAM QUALITY (TURBINE DRIVEN)
POWER REQ'TS, HP, SPEED, START TIME (MOTOR DRIVEN)
NPSH, DISCHARGE HEAD
SYSTEM PARAMETERS AT VARIOUS OPERATING MODES (T, P, Q)
COOLING REQ'TS (FLOW, HEAT REMOVAL)

AVAILABLE FOR AUDIT

PRELIMINARY STRESS ANALYSIS
SYSTEM ANALYSES (PRESSURE DROP, NPSH)
WEIGHT AND CENTER OF GRAVITY OF PUMP

NUCLEAR INDUSTRY'S PRESENTATION TO THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

ON

LEVEL OF DETAIL & COMMENTS ON SECY-90-377 REQUIREMENTS FOR DESIGN CERTIFICATION UNDER PART 52

Bill Rasin, Director, Technical Division, NUMARC

NUMARC PRESENTATION TO ACRS ON SECY-90-377

1. Introduction

2. Industry position on Level of Detail

3. Comments on SECY-90-377

4. Conclusions

INDUSTRY POSITION ON LEVEL OF DETAIL

- TIER 1, FSAR SECTION 1.2, AMPLIFIED TO A LEVEL EQUATING TO A CURRENT SER
- LEVEL OF DETAIL WILL VARY DEPENDENT UPON SAFETY SIGNIFICANCE OF SYSTEM

- o DESIGN MUST BE SUFFICIENTLY DETAILED TO ENABLE NRC TO:
  - COMPLETE SAFETY EVALUATIONS
  - ASSURE CONSTRUCTION CONFORMANCE
  - PREPARE INSPECTION PLANS AND SCHEDULES

- o LEVEL OF DETAIL IN A DESIGN CERTIFICATION FROM PART 52:

  "AN ISSUE THAT WILL HAVE TO BE RESOLVED IN EACH CERTIFICATION RULEMAKING"

COMMENTS ON SECY-90-377

GENERAL COMMENTS

- o INDUSTRY RECOGNIZES AND APPRECIATES THE EFFORT STAFF HAS MADE IN DRAFTING THE DOCUMENT
- o INDUSTRY NOTES NRC ACCEPTANCE OF:
  - TWO TIER APPROACH
  - FLEXIBILITY PROVISION, THE USE OF 50.59 DURING CONSTRUCTION FOR TIER 2 ITEMS
  - PHILOSOPHY OF A GRADED APPROACH TO LEVEL OF DETAIL
  - PHILOSOPHY OF THE LEVEL OF DETAIL SHOULD EQUATE TO: FSAR MINUS AS-BUILT & AS-PROCURED INFORMATION

GENERAL CONCERNS

o LEVEL OF DETAIL

- "FEASIBLE AND PRACTICAL" STANDARD INTRODUCED
- COMMENSURATE SAFETY BENEFITS FROM INCREMENTAL LEVEL OF DETAIL NOT DEMONSTRATED

o NEW AND SUBSTANTIAL REQUIREMENTS FOR DESIGN CERTIFICATION BEYOND PART 52

- INDEPENDENT DESIGN VERIFICATION PROGRAM
- TIER 3/AVAILABLE-FOR-AUDIT
- PROTOTYPE TESTING

CONCERNS CONT'D

- FINALITY STATEMENTS ARE AMBIGUOUS
  - FINALITY FOR TIER 1 INFORMATION ONLY
  - LEADS TO UNPREDICTABLE LICENSING PROCESS AND SCHEDULES
  - ALL ISSUES, EXCEPT SITE-SPECIFIC, MUST BE RESOLVED PRIOR TO DESIGN CERTIFICATION
- DEVELOPMENT OF REGULATORY GUIDE ON LEVEL OF DETAIL
  - SECTION 52.47(A)(1)(I) REFERENCES PART 50 - - REFERENCE FOR APPLICATION FOR DESIGN CERTIFICATION
  - SECTION 50.34 ADDRESSES CONTENTS AND REQUIREMENTS FOR FDA/DESIGN CERTIFICATION 50.34(G)

CONCERNS CONT'D

- SECTION 50.34(g) REFERENCES THE SRP AS THE ACCEPTANCE CRITERIA FOR REGULATIONS

o ADDITIONAL COSTS TO MEET THE LEVEL OF DETAIL REQUIRED BY THE SECY:

  - INDUSTRY ESTIMATES IN EXCESS OF $500 MILLION (4 ALWR PROJECTS IN PROGRESS)
  - EXTREMELY LOW PROBABILITY OF FINANCING THE ADDITIONAL WORK WITHOUT AN ORDER
  - NO POSSIBILITY OF AN ORDER UNTIL DESIGNS ARE CERTIFIED

CONCERNS CONT'D

- o SCHEDULE EXTENSIONS:
  - EVOLUTIONARY 3 TO 5 YRS
  - PASSIVE UNCERTAIN BUT WILL BE IMPACTED BY DELAYS IN EVOLUTIONARY SCHEDULES

CONCLUSIONS

1. COMMISSION SHOULD NOT APPROVE SECY-90-377 AS WRITTEN

   o CONCEPT OF FEASIBLE AND PRACTICAL IS A NEW REQUIREMENT BEYOND PART 52 - - REQUIRES SUBSTANTIAL ADDITIONAL COST WITH NO TIE TO SAFETY

   o IF SECY-90-377 IS ENDORSED, NPOC STRATEGIC PLAN AND NUCLEAR OPTION JEOPARDIZED

2. INDUSTRY INTENDS TO PROVIDE DETAILED COMMENTS ON SECY-90-377 TO NRC STAFF AND COMMISSIONERS AS SOON AS POSSIBLE