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**Agency:** U.S. Nuclear Regulatory Commission  
Advisory Committee on Reactory Safeguards

**Title:** Subcommittee On FTOL Conversions

**Docket No.**

**LOCATION:** Bethesda, Maryland

**DATE:** Wednesday, December 5, 1990 **PAGES:** 1 - 98

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PUBLIC NOTICE BY THE  
UNITED STATES NUCLEAR REGULATORY COMMISSION'S  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

DATE: December 5, 1990

The contents of this transcript of the  
proceedings of the United States Nuclear Regulatory  
Commission's Advisory Committee on Reactor Safeguards,  
(date) December 5, 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.

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

Subcommittee on FTOL Conversions

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

Wednesday, December 5, 1990

The above-entitled proceedings commenced at 1:00  
o'clock p.m., pursuant to notice, Chester P. Siess,  
Subcommittee Chairman, presiding.

PRESENT FOR THE ACRS SUBCOMMITTEE:

- Harold W. Lewis, Member
- James. C. Carroll, Member
- William Kerr, Member

## 1 PARTICIPANTS:

2

3

J. Zwolinski

T. Marsh

4

B. Siegel

A. Masciantonio

5

B. Holian

B. Elliott

6

R. Barrett

S. Chang

7

F. Nandy

D. Vandewalle

8

B. Kessler

D. Lewis

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D. Brannen

L. Lois

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## P R O C E E D I N G S

[1:00 p.m.]

1  
2  
3 MR. SIESS: The meeting will now come to order.  
4 This is a meeting of the ACRS Subcommittee on Full Term  
5 Operating License Conversions. I might point out that we  
6 assigned all of the FTOL Conversions to one Subcommittee  
7 rather than trying to do it with several subcommittees, and  
8 the Subcommittee that was chosen in effect was the  
9 Subcommittee that had handled the systematic evaluation  
10 program that presumably had a little background on these  
11 particular plants.

12 I am Chester Siess, Subcommittee Chairman. The  
13 other ACRS Members in attendance are Harold Lewis on my  
14 left, Bill Kerr sitting over here, and I assume that J.  
15 Carroll will come in a little later. The purpose of the  
16 meeting, as announced, is to discuss the FTOL Conversion for  
17 the Palisades Nuclear Plant. There might be, in the  
18 process, some reference to the Dresden 2 plant because the  
19 full Committee will be considering both of those tomorrow.  
20 Anything that we will have to say about Dresden will be sort  
21 of on the side, and it wasn't part of the announced scope of  
22 the meeting.

23 The cognizant ACRS Staff Member for the meeting is  
24 Dean Houston, who is sitting on my right. The rules for  
25 participation in today's meeting were announced as part of

1 the Federal Register Notice on November 20th. A transcript  
2 is being kept, and will be made available as stated in the  
3 Federal Register Notice. Because there is a transcript it  
4 is requested that each speaker first identify himself or  
5 herself, and then speak with sufficient clarity and volume  
6 so that he or she can be readily heard. That means speak  
7 about this far from these microphones. If you are sitting  
8 where there isn't a microphone and you need to speak, find  
9 one.

10 We received no written comments or requests to  
11 make oral statements from members of the public.

12 The staff I think in their introduction, will  
13 explain this peculiar thing called FTOL conversions. All of  
14 the plants that we will be looking at that have FTOL  
15 conversions were included as part of the systematic  
16 evaluation program, and for the Committee's information at  
17 least we have done two conversions previous to this. Ginna  
18 we did back in 1984 and Millstone I back in 1985. This  
19 Subcommittee meeting will deal with Palisades. The full  
20 Committee meeting tomorrow morning will deal with both  
21 Palisades and Dresden, and then we have two more to go, San  
22 Onofre I and Oyster Creek.

23 For the benefit of the Subcommittee members I have  
24 prepared a draft full Committee letter for Palisades, and  
25 you have copies of that. It's a letter that follows a

1 format that we used on the previous ones for Ginna and  
2 Millstone. We also have passed out for Palisades a May 11,  
3 1982 letter which is our report on the integrated IPSAR. I  
4 can't remember what IPSAR stands for. Integrated --

5 MR. KERR: Safety Assessment.

6 MR. SIESS: It wasn't probability in there, was  
7 it?

8 MR. KERR: No.

9 MR. SIESS: The integrated assessment from the  
10 SEP. In that letter you will recall that we said that we  
11 defer our FTOL review until the staff had completed its  
12 action. The actions to be completed were the outstanding  
13 SEP items, the USI, the GSI outstanding items, and TMI  
14 action plan items. The safety evaluation report that we  
15 have received from the staff on the FTOL conversion from  
16 Palisades addresses only those items of the SEP that were  
17 still outstanding at the time of the IPSAR plus the USI's,  
18 GSI's and the TMI action plan items. For some reason they  
19 include in that some exemptions from existing regulations  
20 which are relatively minor.

21 From my point of view, and I am certainly not  
22 expressing the opinion of the Full Committee, the FTOL  
23 conversion is more of a legal matter than it is a technical  
24 matter. At some point I expect to ask the staff whether the  
25 conversion from the POL to the FTOL either helps or hinders

1 their ability to ensure the safety of the plant.

2 Do any members of the Subcommittee have any  
3 questions or comments at this time?

4 [No response.]

5 MR. SIESS: John Zwolinski from NRR is going to  
6 introduce this and introduce his people that are here and  
7 lead into the review.

8 MR. ZWOLINSKI: Thank you very much, Dr. Siess. I  
9 am John Zwolinski, Assistant Director for Section III  
10 projects in the Office of Nuclear Reactor Regulation. I  
11 have asked a number of my staff to participate today in  
12 support of this particular discussion on Palisades, in  
13 particular our project director --

14 MR. SIESS: Excuse me, John. Do we have handouts?

15 MR. ZWOLINSKI: Yes you do, except for this one  
16 that I have up here.

17 MR. SIESS: Thank you.

18 [Slide.]

19 MR. ZWOLINSKI: Dr. Siess, I would like to take a  
20 couple of minutes to introduce the staff that is supporting  
21 this effort. In particular on the Palisades side of the  
22 house, our project director responsible for Palisades is Tad  
23 Marsh and our project manager is Brian Holian and Armand  
24 Masciantonio sitting across the table from me.

25 The Dresden project director, Rich Barrett, will



1 be in attendance tomorrow. He is responsible for Dresden.  
2 On his staff and responsible for Dresden as the project  
3 manager is Bryan Siegel. We also stand prepared to talk  
4 about pressurized thermal shock this afternoon. Barry  
5 Elliott of the staff, Lambrose Lois of the Staff and Sy  
6 Chang are here to discuss that particular issue to whatever  
7 extent you would like to hear.

8 We have structured our presentations today to  
9 pretty much follow the guidelines that we received from your  
10 staff. We do have some opening remarks that we would like  
11 to make about the evolution of POL's two FTOL's, and why we  
12 are here chatting with you maybe 20 years after the initial  
13 license was granted. I asked Byron Siegel of the staff to  
14 give that overview. You characterized early on in your  
15 comments the more legalistic approach. I think we will be  
16 able to probe that a little bit further in Byron's opening  
17 remarks.

18 With that as a very brief introduction, I would  
19 have staff again be sure that they state their names prior  
20 to speaking. I would like Mr. Siegel to go ahead.

21 MR. SIESS: You mentioned 20 years. I was  
22 Chairman of the ACRS Subcommittee for Operating License on  
23 Palisades. I have a photograph that I should have brought  
24 with me when the plant was under construction. It had a  
25 great big hole in the side of the containment. I hear they

1 have done that again.

2 MR. ZWOLINSKI: Right. They are in the process of  
3 filling the hole again.

4 MR. SIESS: Was it in the same place?

5 MR. HOLIAN: It was right above the original  
6 opening.

7 MR. SIESS: Okay. As I recall, that's the way  
8 they got the vessel in, the steam generator in, everything  
9 went in through the hole.

10 MR. HOLIAN: That's correct.

11 [Slide.]

12 Mr. SIEGEL: For some reason along the line I got  
13 inherited, I guess being the lead project manager for this  
14 effort of this conversion, I guess because I volunteered for  
15 something along the way. Basically like Mr. Siess said and  
16 like John said and reinforced, it is a legalistic issue.  
17 Basically, there were originally 15 provisional operating  
18 license's issued.

19 In 1970 there was a rule change made which deleted  
20 from the regulations the issuance of POL's. For some reason  
21 it was neglected to account for the fact that there were 15  
22 plants out there that had provisional operating licenses,  
23 and a result we ended up with a situation where these plants  
24 didn't have any means of converting to full term operating  
25 license.

1 Pursuant to 10 CFR 2.109, prior to 30 days before  
2 the provision license expires if you apply for a full term  
3 operating license, then your license essentially remains in  
4 effect until the Commission takes action. It has taken  
5 approximately 20 years for the Commission to take action for  
6 various reasons that are outlined below. This slide is  
7 really for tomorrow for Dresden, but it's applicable to  
8 Palisades too. Most of it is but there are a few things  
9 that are Dresden-specific.

10 Basically both Dresden and Palisades applied for  
11 full term operating licenses. In 1975 the staff stopped  
12 review of conversions due to backlog of un-reviewed USI's  
13 and GSI's. In 1977, the Commission adopted a staff  
14 recommendation that POL's be included as Phase II of SEP  
15 program. In fact, I believe that all of the remaining  
16 plants were part of Phase II of the SEP programs. There was  
17 one plant, I think Monticello, that got a license earlier  
18 that was not part of the SEP program.

19 Since that time when we completed the SEP program  
20 for both Dresden and Palisades, there were open issues on  
21 both Dresden and Palisades that -- Armand, there is no  
22 supplement for Palisades is there on a SEP?

23 MR. MASCIANTONIO: Yes, there is.

24 MR. SIEGEL: There were open issues -- a  
25 significant number of open issues on both Dresden and

1 Palisades which necessitated a supplement before we could go  
2 forward with the license conversion. Those supplements were  
3 issued for both Dresden and Palisades, and we also did an  
4 environmental assessment. We did not do an environmental  
5 statement because there were not significant plant changes  
6 to the site or to the plants during the time from its  
7 initial license to the time of this conversion. The changes  
8 were relatively minor, and as a result, we just did an  
9 environmental assessment.

10 Both for Dresden and Palisades we did  
11 environmental assessments and prepared safety evaluation  
12 reports this year for Dresden and Palisades in the fall of  
13 this year. We are prepared to essentially go forward with  
14 the process, the next step being to tell ACRS the status of  
15 these plants.

16 Basically both of these plants have been operating  
17 for 20 years or close to 20 years. The way the staff  
18 handles issues related to Dresden and Palisades is the same  
19 as any other plant. We don't distinguish between them with  
20 regard to any licensing actions or activities or any USI's,  
21 GSI's, or multi-plan action items. They are essentially the  
22 same as any other plant they are treated, and we don't  
23 distinguish between them.

24 It is a legalistic issue, and as a result there  
25 aren't any safety concerns specifically associated with

1 having a POL license as opposed to a full term operating  
2 license.

3 MR. CARROLL: Do both of the plants have custom  
4 tech specs?

5 MR. SIEGEL: Dresden has custom tech specs.

6 MR. HOLIAN: Palisades has custom tech specs.

7 MR. CARROLL: Neither of them have been backfitted  
8 with the STS?

9 MR. SIEGEL: Dresden is in the process of updating  
10 their tech specs as part of a tech spec improvement program.  
11 It isn't the one that the staff is working on, but they are  
12 upgrading the tech specs. It came out of a diagnostic  
13 evaluation team inspection, and they are going -- in some  
14 areas they are updating for standard tech specs. For  
15 instance, all the tables are being updated so that they have  
16 the format of the standard tech specs. Beyond that, I don't  
17 know if they have any plans when the new and improved tech  
18 specs come up, whether or not they are going to do anything.

19 MR. HOLIAN: Palisades is in a similar situation.  
20 They are evaluating the standard tech specs, the new  
21 restructured standard tech specs that Combustion Engineering  
22 is putting forth. They have one person working fulltime on  
23 that issue. They were looking forward to, in 1991, putting  
24 in a submittal but that's been delayed along with their  
25 program. They are still looking in that direction.

1 MR. ZWOLINSKI: If I might add, on the  
2 Commonwealth Edison --

3 MR. SIESS: You said new improved tech specs?

4 MR. SIEGEL: Yes, that's what the tech spec branch  
5 is working on.

6 MR. SIESS: Is that one word, new and improved?

7 MR. SIEGEL: Maybe it's just improved tech specs.  
8 It was an overkill.

9 MR. ZWOLINSKI: If I might add to your particular  
10 question on our new tech specs that are being sponsored by  
11 the staff, Commonwealth Edison is an active participant in  
12 the Industry Owners Group to speak to the needs of the  
13 industry and working with the staff, and it's our  
14 understanding that they will commit to standardized tech  
15 specs for all their units after the staff has completed  
16 their work.

17 MR. SIEGEL: What we try to do -- and you said  
18 that you were involved in the Ginna and Millstone  
19 Conversions -- the SER's on those were, relatively speaking,  
20 quite a bit bigger than these are. Basically they included  
21 a lot of things that we decided not to do. Back in 1988 we  
22 decided to take a look at this and decide if we could sort  
23 of streamline the process and not spend as much time as we  
24 had on the other plants.

25 Oyster Creek, which is coming up, actually is

1 using the old format because they were almost completed when  
2 we decided to do this. Palisades and Dresden and San Onofre  
3 will probably use the same format that is in this SER.  
4 Basically, we didn't feel that it was necessary to reiterate  
5 again all the facility improvements and modifications which  
6 the staff was aware of and the resident inspectors and  
7 regions have looked at. We had already approved all the  
8 license amendments and exemptions, and we had SER's on all  
9 closed issue TMI and USI SEP topics.

10 We didn't think it was necessary to essentially  
11 repeat all of those in this large document. We checked with  
12 OGC. OCC was of the feeling that it was never the intent in  
13 the first place to do that. So, what we ended up with is  
14 just identifying all the significant open items that still  
15 remain on the plant. A lot of these items with the  
16 exception of the SEP which is unique to the SEP plants, are  
17 basically -- for all the plants that are in operation now --  
18 there are very few of the items that are unique to Dresden  
19 or Palisades or Oyster Creek or San Onofre. They are  
20 basically issues that are in common with many plants for the  
21 most part. Those that aren't, we will identify as we go  
22 along.

23 The SER basically addresses just TMI open items,  
24 and there aren't very many left. We will describe what they  
25 are for the plant. SEP open issues -- I don't know if there

1 are many in Palisades and there are only about three in  
2 Dresden.

3 MR. MASCIANTONIO: We have two open issues.

4 MR. SIEGEL: Significant open items, those could  
5 be MPA items. A few of them, at least in Dresden's case,  
6 are somewhat unique to Dresden -- I will discuss those  
7 tomorrow -- and USI's, most of which are resolved. Just the  
8 open USI's. Essentially the USI's are resolved but they may  
9 not be completed on a plant-specific basis.

10 MR. SIESS: Resolved, but not implemented.

11 MR. SIEGEL: Exactly, yes. That's correct.

12 MR. SIESS: I admit that I didn't go back and look  
13 at the Millstone or Ginna SER's, assuming that I could even  
14 find them, but from looking at our letters that wrote on the  
15 FTOL conversion, do those SER's cover operating experience?

16 MR. SIEGEL: I think they did to some degree, yes.

17 MR. SIESS: I know the SEP had the extensive  
18 review of operating experience from Oak Ridge, and I can't  
19 recall whether that was covered in the SER or not.

20 MR. SIEGEL: I believe there was a limited amount  
21 of operating experienced included in those.

22 MR. SIESS: That is not addressed here?

23 MR. SIEGEL: No, it is not addressed here.

24 Tomorrow you will hear from Commonwealth Edison, and I  
25 believe Consumers Power is here too. Brian is going to give



1 a summary of the operating history for your benefit for  
2 both. You will get that tomorrow for both the Dresden and  
3 Palisades.

4 MR. SIESS: Okay, thank you.

5 MR. SIEGEL: With that, I am concluded.

6 MR. KERR: Let me ask, on page 1-11 of the SER I  
7 guess it is --

8 MR. MASCIANTONIO: Is that for -- which plant?

9 MR. KERR: Palisades. I have a draft. SEP Topic  
10 III-6 seismic design is --

11 MR. SIESS: That's on page 16 if you have the  
12 final version.

13 MR. KERR: Anyway, the statement is made that  
14 after IPSAR supplement I is issued, CP Company submitted  
15 information related to the first, second and third and six  
16 issues above. The staff reviewed the information and issued  
17 SER on October 20th. On the basis of that review, all six  
18 of the issues remain unresolved. Is that a typo?  
19 Admittedly I have a draft, because I somehow --

20 MR. MASCIANTONIO: Could you point me to the right  
21 --

22 MR. SIESS: The wording isn't changed.

23 MR. KERR: What am I being told in that sentence  
24 then?

25 MR. MASCIANTONIO: Could you point me to the right

1 section?

2 MR. CARROLL: It's on page six.

3 MR. SIESS: It's on 1-7, right under the Roman VI.  
4 There is a sentence that begins after IPSAR supplement I was  
5 issued --

6 MR. MASCIANTONIO: The staff reviewed information  
7 on SER on October 20. That is a typo.

8 MR. SIESS: What should it read?

9 MR. KERR: Are all six of the issues remain  
10 unresolved? If so, I guess I don't --

11 MR. MASCIANTONIO: That is 1990 that should be.

12 MR. KERR: On the basis of the review, all six of  
13 the issues remain unresolved? Is that a valid statement?

14 MR. MASCIANTONIO: Yes. Let me go back to try and  
15 get my place here. The staff reviewed the information and  
16 issued an SER on October 20, 1986, that is correct. This  
17 year in 1990, we issued an SER closing our four of these six  
18 issues. There are two issues which now remain un-  
19 implemented.

20 MR. SIESS: This is completely confusing or  
21 completely wrong. What is the date that should be changed?

22 MR. MASCIANTONIO: I have the final version of the  
23 SER, this one --

24 MR. SIESS: I have the final version of the SER  
25 too, the blue cover.

1 MR. LEWIS: I think what he said, and I could be  
2 wrong, as of 1986 all six were unresolved but four have just  
3 been resolved.

4 MR. MASCIANTONIO: Right. Four have been  
5 resolved.

6 MR. SIESS: Where does it say that?

7 MR. LEWIS: It doesn't say that.

8 MR. SIESS: The January 21, 1987 date is still the  
9 correct date?

10 MR. MASCIANTONIO: Yes. Brian, help me out a  
11 little bit. These were just resolved with the SER that we  
12 just issued and developed two months ago; is that correct.

13 MR. LEWIS: That's the one that we are looking at.

14 MR. MASCIANTONIO: There are two --

15 MR. SIESS: I'm sorry. Will you hold up what you  
16 are looking at, please? Is there a later issue that this?

17 MR. MASCIANTONIO: No, that is the same one.

18 MR. LEWIS: This is --

19 MR. CARROLL: We are talking NUREG 1424 dated  
20 November, 1990.

21 MR. MASCIANTONIO: Right.

22 MR. SIESS: According to that NUREG, SEP topic  
23 III-6 is under review.

24 MR. MASCIANTONIO: That is correct. It is still  
25 not completely resolved. There are two issues still to be

1 resolved on that dealing with motor control centers. Four  
2 of those issues have been resolved.

3 MR. LEWIS: Is the situation that there should be  
4 another sentence in this which says elsewhere in this SER  
5 four of these issues are resolved; is that what it should  
6 say?

7 MR. HOLIAN: This SER was I guess written and  
8 drafted before the staff review. The final staff SER has  
9 not gone out addressing any of the six issues.

10 MR. SIESS: You are using something that is  
11 confusing some of us. This is an SER for the FTOL. The  
12 staff also writes SER's on the resolution of each issue.  
13 That's what you are talking about?

14 MR. HOLIAN: That's correct. That SER addressing  
15 all six of these issues has not gone out. In the internal  
16 staff review, four of those have been resolved. We are  
17 waiting for the final two to be resolved right now. We are  
18 waiting for licensee to address the final two issues, and  
19 then a full SER will be sent out addressing all six issues.

20 MR. SIESS: I would suggest in that particular  
21 stuff we have been looking at you have more detail than is  
22 needed to give information that is wrong.

23 MR. HOLIAN: The information is not up-to-date.

24 MR. CARROLL: The next sentence makes it even  
25 murkier. You are talking all six of the issues remained

1 unresolved. The sixth issue -- will be resolved. How about  
2 the other five?

3 MR. HOLIAN: The status, as I said, up-to-date  
4 status as I said. We can refine that paragraph. You are  
5 right, that paragraph doesn't say everything up-to-date as  
6 it is now.

7 MR. SIESS: It's confusing.

8 MR. MASCIANTONIO: You have to understand that  
9 this was printed in October, and we did not have the final  
10 resolution at that time.

11 MR. SIESS: For example, the next topic, III-7B  
12 has been resolved. The staff has issued its safety  
13 evaluation report on that SEP item; am I correct?

14 MR. MASCIANTONIO: III-7B?

15 MR. SIESS: Yes.

16 MR. MASCIANTONIO: That has not been resolved, no.

17

18 MR. SIESS: It has not?

19 MR. MASCIANTONIO: It has not. The staff SER has  
20 not been issued to reflect the current status.

21 MR. SIESS: I have a letter from -- I didn't bring  
22 it with me, I guess. I thought I had a letter from  
23 Crutchfield saying that the issue had been resolved.

24 MR. SIEGEL: I had sent you out a letter from  
25 Dresden. It may have been for Dresden.

1 MR. SIESS: I'm sorry, okay.

2 MR. LEWIS: There's an additional trivial point,  
3 which is that you say this was drafted in October but it's  
4 dated November. If it's not to be regarded as current  
5 through the actual date on it, it would be worth saying in  
6 it that the information in this is correct as of October or  
7 something like that. A casual reader looking at the date  
8 would think it's up-to-date as of that date.

9 MR. SIESS: I agree. In order to simplify what we  
10 are doing, gentlemen, I would suggest that we really don't  
11 care whether these things have been resolved or not; that  
12 is, whether they have been resolved or not has no  
13 significant bearing on whether they are issued an FTOL or  
14 not. The process of resolving those issues will go on  
15 exactly the same whether the plant has an POL or FTOL; am I  
16 correct?

17 MR. MASCIANTONIO: That is true.

18 MR. SIESS: It has a minor bearing on what I put  
19 in our letter, as to what was open.

20 MR. HOLIAN: Right. That paragraph is correct as  
21 it stands. I mean, we have given you additional information  
22 now on current staff review. It is correct as it stands  
23 there.

24 MR. SIESS: I just needed some editing though.  
25 When it says that they got information for the first,

1 second, third and sixth and the staff reviewed that, and on  
2 the basis of the review all six issues -- I go from six  
3 issues to four issues to six issues to one issue -- it is a  
4 pretty good example of bad writing, providing information we  
5 really didn't need.

6 MR. LEWIS: He is right. It is technically  
7 correct because of the "ed" on remained.

8 MR. ZWOLINSKI: I will accept responsibility for  
9 the product as written.

10 MR. SIESS: I should note though, that I am  
11 pleased that you are making such rapid progress that we  
12 can't keep these things up-to-date.

13 MR. MASCIANTONIO: I would like to begin. Maybe  
14 some of the questions that come up will be answered as we go  
15 through the presentation. My name is Armand Masciantonio.  
16 I am a project manager in PD-III-1. My presentation this  
17 afternoon will summarize the information in the safety  
18 evaluation report which was previously provided to the ACRS.

19 [Slide.]

20 MR. MASCIANTONIO: The topics that I will be  
21 covering today are, I will give some background information  
22 on the license conversion, I will highlight some of the  
23 major events in the Palisades operating history, discuss the  
24 systematic evaluation program and its impact on license  
25 conversion, and review the un-implemented, unresolved safety

1 issues applicable to Palisades.

2 It wasn't our intent to go into a detailed  
3 technical discussion on these topics, but simply to provide  
4 an overview of the issues significant to license conversion.  
5 I would like to begin by providing some historical  
6 background to supplement the information that was provided  
7 by Byron just a few minutes ago.

8 [Slide.]

9 Between 1959 and 1971, the Atomic Energy  
10 Commission issued provisional licenses to 15 power reactors.  
11 These POL's were for periods of up to 18 months to allow an  
12 interim time of routine operation, during which both the  
13 licensee and the staff could assess plant operations and  
14 resolve any generic concerns identified during the licensing  
15 process. Palisades was issued a construction permit in  
16 March of 1967. The provisional license was issued in March  
17 of 1971, and was due to expire in March of 1974.

18 However, on January 22 of 1974, Consumers Power  
19 applied for the conversion of the license. According to the  
20 provisions of 10 CFR Part 2109, it was allowed to continue  
21 operating the plant beyond the license expiration date,  
22 pending the disposition of the application. As Byron  
23 mentioned, because of the large number of unresolved generic  
24 issues relevant to the operation of those plants operating  
25 under provisional licenses, the staff stopped reviewing



1 provisional license conversions in 1975 and instead set out  
2 to establish the appropriate review scope to support license  
3 conversions.

4           It turned out that much of the review necessary  
5 for the license conversion was similar to the scope that was  
6 proposed for the systematic evaluation program. The staff  
7 recommended to the Commission in 1977, that the provisional  
8 license facilities be included in the systematic license  
9 evaluation program. The results of the technical evaluation  
10 provided under the SEP which support the issuance of the  
11 full term license are documented in the integrated plant  
12 safety assessment report, the IPSAR, and the supplement to  
13 the IPSAR which was issued a year later and resolved a lot  
14 of the SEP items.

15           [Slide.]

16           MR. SIESS: Excuse me. The ACRS traditionally  
17 does not deal with environmental considerations.

18           MR. MASCIANTONIO: Okay. Do you want me to skip  
19 right over that?

20           MR. SIESS: Yes.

21           [Slide.]

22           MR. MASCIANTONIO: Palisades is a combustion  
23 engineering Bechtel pressurized water reactor. It is  
24 licensed at a power level of 2,530 megawatts, has two hot  
25 legs and two steam generators, and four cold legs with four

1 coolant circulation pumps. The secondary side consists  
2 basically of the turbine generator, the condenser, and the  
3 feedwater system. The reactor containment is a concrete  
4 dome and cylinder on a concrete slab, with a one-quarter  
5 inch steel liner on the inside containment walls. It uses  
6 mechanical draft cooling towers.

7 The plant is located on the Eastern Shore of Lake  
8 Michigan near South Haven.

9 MR. SIESS: You might note that it didn't start  
10 out with mechanical draft cooling towers.

11 MR. MASCIANTONIO: Yes, sir. I will have a few  
12 words on that a little bit later when the change was made.  
13 The nearest population center is the combined twin cities of  
14 Benton Harbor and St. Joseph, located about 16 miles to the  
15 South of the plant.

16 [Slide.]

17 A little bit about the plant history. Along with  
18 the application for a full term license in January of 1974,  
19 the licensee requested a power increase from the original  
20 license power of 2,200 megawatts to 2,638 megawatts. That  
21 power increase was denied at the time because of steam  
22 generator problems. In March of 1974 the plant was modified  
23 to allow operation with a closed cooling cycle using the  
24 mechanical cooling towers which previously had used once  
25 through cooling from Lake Michigan.

1           In December of 1977, Palisades was granted a power  
2 increase after a new application to 2,530 megawatts, based  
3 this time on improvements to the steam generators. Another  
4 major event was the approval in July of 1987 to increase the  
5 amount of spent fuel storage in the fuel pool by about 200  
6 fuel assemblies to its present capacity of 892 fuel  
7 assemblies.

8           MR. SIESS: That seems almost trivial, in view of  
9 some of the changes. How much will that accommodate?

10          MR. MASCIANTONIO: That will accommodate a full  
11 core offload until about 1992.

12          MR. SIESS: Next year -- two years.

13          MR. MASCIANTONIO: Right, two years. That's for  
14 full core offload. For the future --

15          MR. SIESS: This was just condensed --

16          MR. MASCIANTONIO: Yes. Re-racking and condensing  
17 of the existing. In the future for future storage --

18          MR. CARROLL: Did they ship spent fuel in the  
19 early days?

20          MR. MASCIANTONIO: That, I don't know.

21          MR. HOLIAN: No, they did not.

22          MR. CARROLL: This is all the fuel they have  
23 discharged?

24          MR. HOLIAN: That's correct.

25          MR. SIESS: This is not very big, 2,230.

1 MR. CARROLL: How many fuel assemblies are in the  
2 core?

3 MR. MASCIANTONIO: Mr. Vandewalle could help us  
4 out.

5 MR. VANDEWALLE: It's 204.

6 MR. MASCIANTONIO: For future storage, the  
7 licensee has indicated that it will apply for a general  
8 license under the new Subpart K for the on-site storage in  
9 dry casks. The steam generators -- the other item worth  
10 noting -- they have had a long history of tube leaks which  
11 led the utility to replace both steam generators during the  
12 current outage. We will have more detail on this a little  
13 bit later.

14 MR. KERR: You mentioned when you began that the  
15 temporary operating license or preliminary -- whatever at  
16 the time -- was granted to give the licensee and the staff  
17 about an 18 month to two year period to evaluate operating  
18 experience. Did that evaluation occur?

19 MR. MASCIANTONIO: Yes, it did. The license was  
20 issued in steps. The original license was for very little  
21 power. I don't know the exact numbers, but the power  
22 increase was granted in steps over a maybe three or four  
23 different license upgrades. As the upgrading history  
24 started to develop the power increase was allowed. The last  
25 provisional license that was issued granted full power at

1 that time to 2,200 megawatts. There was a period of  
2 learning with gradual increase in power to higher levels.

3 MR. KERR: At least sufficient evaluation took  
4 place to approve operation at the -- what was it --

5 MR. MASCIANTONIO: It was 2,200.

6 MR. KERR: Thank you.

7 MR. CARROLL: This was the first commercial  
8 Combustion Engineering design; is that right?

9 MR. HOLIAN: The first full scale Combustion.

10 MR. SIESS: At the time it was licensed it was the  
11 largest plant?

12 MR. HOLIAN: By Combustion?

13 MR. SIESS: By anybody.

14 MR. HOLIAN: Okay, thank you.

15 MR. SIESS: I think Haddam Neck had gone to 600  
16 just before that. This is at 800.

17 [Slide.]

18 MR. MASCIANTONIO: The systematic evaluation  
19 program, I will give you a little bit of background on that.  
20 I don't know if that's necessary, but just for the sake of  
21 completeness. The Commission initiated the systematic  
22 evaluation program to provide a framework for reviewing the  
23 design of older operating plants, to reconfirm and document  
24 their safety.

25 The review provided first of all, and assessment

1 of the significance of the differences between current  
2 technical positions on safety issues and those that existed  
3 when the plant was licensed. Secondly, a basis for making  
4 decisions on how these differences should be resolved in an  
5 integrated plant review. The review compared the as-built  
6 plant design with the then current review criteria in 137  
7 different topic areas. During the SEP review, 47 of the  
8 topics were deleted for Palisades because either the topics  
9 were being reviewed under another program or else the topic  
10 was not applicable to the Palisades plant.

11 So, of the original 137 topics, 90 were reviewed  
12 for Palisades. Of these, 59 met the current criteria or  
13 were acceptable on some other defined basis. The review of  
14 the 31 remaining topics found that some aspects of the plant  
15 design differed from the current criteria. Evaluation of  
16 these topics and their status is addressed in NUREG-0820,  
17 Supplement 1 which was a supplement to the SEP. That  
18 supplement was published in November of 1983. Of the 90  
19 topics that were reviewed, all but three were closed in  
20 Supplement 1.

21 [Slide.]

22 Those three topics -- maybe this will clear some  
23 of the misunderstandings at the beginning. Topic III-5A,  
24 the effects of pipe breaks in site containment; Topic III-6,  
25 seismic design issues; Topic III-7B, design codes and

1 standards, at that time were left unresolved. They were  
2 open at the end of Supplement 1.

3 Topic III-5A was subsequently closed out based on  
4 a staff SER which was issued in February of 1987. Topic  
5 III-6A relates to the seismic design issues -- III-6 relates  
6 to seismic design issues and addresses the adequacy of the  
7 design of certain structures to withstand seismic motions.  
8 There were six open issues under that topic at the time of  
9 the SEP supplement. Four of these issues were resolved by a  
10 staff SER which was published internally in August of 1990 -  
11 - we received the SER for that. The remaining two issues  
12 are still under review, dealing primarily with the seismic  
13 adequacy of motor control centers.

14 Topic III-7B deals with the extent of Palisades  
15 conformance to revised design codes and standards. The only  
16 issue not resolved at the time of the SEP supplement was  
17 extreme snow loading on the roof the spent fuel building.  
18 This issue still needs to be resolved, and the staff is  
19 working on that. These two remaining topics --

20 MR. CARROLL: There is a design code or standard  
21 dealing with snow loading?

22 MR. MASCIANTONIO: There was a change in the  
23 requirements, and we are addressing that based on what  
24 Consumers is providing us. Again, the technical details, we  
25 will have to find out for you.

1 MR. CARROLL: The only thing that I was curious  
2 about was when you say design code and standards, are you  
3 talking about ASME, ASTM as standards or are you talking  
4 about some internal staff standards?

5 MR. MASCIANTONIO: No, it's the industry codes,  
6 the building codes and industry codes.

7 MR. CARROLL: There is an industry code of some  
8 sort on extreme snow loading?

9 MR. MASCIANTONIO: Yes, sir. These two remaining  
10 topics will be reviewed and are being reviewed, and will be  
11 resolved through normal licensing action.

12 [Slide.]

13 The unresolved safety issues, the status of the  
14 USI's was addressed in staff review of the responses to a  
15 generic letter that went out last year, Generic Letter 89-  
16 21. The results were presented to the Commission in  
17 February of 1990. Of the USI's, 12 were applicable to  
18 Palisades. Of those 12, six have not yet been fully  
19 implemented at Palisades.

20 [Slide.]

21 The six USI's remaining; USI A-9, the ATWS rule,  
22 the status of that is that the staff issued an SER in  
23 December of 1989 which accepted the Palisades ATWS design.  
24 The modifications implementing the design are currently in  
25 progress during the current outage.



1 MR. SIESS: Excuse me. You are updating us now,  
2 right, because the SER included A-2.

3 MR. MASCIANTONIO: A-2 -- the SER includes all of  
4 the USI's which are applicable to Palisades. These six are  
5 the ones that are not fully implemented. The other ones  
6 have been fully implemented.

7 MR. SIESS: A-2 then, you have issued an SER and  
8 you are satisfied; right?

9 MR. MASCIANTONIO: Yes. The six USI's that I am  
10 not addressing today have been implemented.

11 MR. SIESS: Okay, thank you.

12 MR. MASCIANTONIO: The next USI, A-11, reactor  
13 vessel material toughness, Consumers Power joined a CE  
14 Owners group to determine the effects of low upper shelf  
15 energy values. The staff will be working with the licensee,  
16 the Owners Group and ASME code subgroup to resolve the issue  
17 of low CHARPY values. Consumers is also pursuing an  
18 alternate approach using accelerated irradiation specimens  
19 from other plate material along with justification as to the  
20 chemical similarity to the limiting plate material. The  
21 licensee has completed the efforts on the alternate approach  
22 and has submitted the results to the staff for review, and  
23 those results are now under review.

24 MR. SIESS: I have a little trouble getting  
25 straight in my mind the difference between A-11 and the LTOP

1 issue. Are they as separable as you have made them here?

2 MR. MASCIANTONIO: They are all inter-related, and  
3 I will defer to Barry a little bit later and maybe he can  
4 explain the differences between them all.

5 MR. ELLIOTT: Excuse me. The two issues  
6 identified up there, the reactor vessel issues are A-11 and  
7 A-49. A-11 is a low upper shelf energy issue. There is a  
8 regulatory requirement in Appendix G --

9 MR. SIESS: I know that. That has no relation now  
10 to PTS at all?

11 MR. ELLIOTT: PTS, it does not. It is a different  
12 issue. One is an upper shelf --

13 MR. SIESS: I didn't ask if they were different  
14 issues. I said is there any relation physically,  
15 metallurgically, structurally?

16 MR. ELLIOTT: Yes, there is a relationship.

17 MR. SIESS: You just want to discuss them  
18 separately because they are separately defined issues?

19 MR. ELLIOTT: Right.

20 MR. SIESS: We will discuss the PTS when we get to  
21 it under A-49.

22 MR. ELLIOTT: Yes.

23 MR. MASCIANTONIO: A-44, station blackout --

24 MR. KERR: Excuse me. If you are leaving A-11, I  
25 got the impression that there was not a problem at present

1 but that there would be before the license expired; is that  
2 a correct interpretation?

3 MR. MASCIANTONIO: Dresden, I can't speak to.

4 MR. KERR: No. We are not talking about Palisades  
5 anymore?

6 MR. MASCIANTONIO: Yes. Palisades, on the A-49 --

7 MR. KERR: No, I am at A-11.

8 MR. SIESS: The question relates to A-11 for  
9 Palisades, the one you are talking about right now.

10 MR. MASCIANTONIO: Palisades has not indicated a  
11 problem right now. Barry, would you like to add?

12 MR. ELLIOTT: A-11 is the low upper shelf. If you  
13 follow just the Reg Guide 1.99 methodology, it would be a  
14 problem for Palisades towards the end of their license.

15 MR. KERR: But it is not now?

16 MR. ELLIOTT: Palisades has submitted a document--

17 MR. KERR: I am trying to find out the present  
18 operating situation of the plant, and my impression is that  
19 the plant is within the guidelines at the present time.

20 MR. ELLIOTT: Yes.

21 MR. KERR: That's all I wanted to know.

22 MR. ELLIOTT: We just haven't finished reviewing  
23 it.

24 MR. SIESS: That doesn't mean it isn't a problem.  
25 If they are going to run out --

1 MR. KERR: Of course, but if one is looking at  
2 assuming this has something to do with safety which may not  
3 be a valid interpretation, it is not in the staff's view a  
4 safety problem now.

5 MR. ELLIOTT: Right.

6 MR. KERR: That's all I wanted to find out. Thank  
7 you.

8 MR. MASCIANTONIO: On USI A-44, station blackout,  
9 the final modifications in response to the rule have been  
10 completed now during this outage. The staff is reviewing  
11 the Consumers Power response to the rule which was submitted  
12 in April of 1989, and we will issue an SER.

13 On USI A-46, seismic qualification of equipment,  
14 the issue is being resolved through the seismic  
15 qualification utility group. Consumers Power, as a member  
16 of that group, will follow the recommendations when that  
17 issue is resolved and when the guidelines are issued. On A-  
18 47, safety implications of control systems, this issue was  
19 resolved by Generic Letter 89-19. Consumers Power responded  
20 as part of a CE Owners Group in March of 1990, and concluded  
21 at the time that the recommendations should not be  
22 implemented at Palisades at this time but they will be  
23 addressed under the IPE program. That issue or that  
24 response is being reviewed by the staff at the present time.  
25

1 MR. CARROLL: I had the impression that the staff  
2 had taken a very strong position on that; that it told the  
3 Owners Group that is not acceptable. That is not the case?

4 MR. MASCIANTONIO: I can't speak to the --

5 MR. HOLIAN: The Owners Group, they have just met  
6 within the last month and tech staff is still taking a look  
7 at that. The Owners Group together gave a presentation that  
8 said that they didn't think it was of the safety  
9 significance that the staff had deemed, staff looking at all  
10 CE plants together. That issue is still under review.

11 MR. CARROLL: I thought I read in the Weekly  
12 Report in the last week or two that NRR had gotten San  
13 Onofre II and III to agree to put in the overfill  
14 protection.

15 MR. HOLIAN: That's correct. A few of the plants  
16 are abandoning the Owners Group, if you want to put it that  
17 way, and coming in with their own individual reasons.

18 MR. CARROLL: I guess I also had the impression  
19 that it sounded to me like they had made a pretty good case  
20 that the protection may have some negative safety impacts.

21 MR. HOLIAN: That's correct. That's the Owners  
22 Group position, and that's why the staff is taking their  
23 time in reviewing it in full. The result on the rest of the  
24 plants is still up in the air.

25 MR. CARROLL: It shuts main feedwater off they

1 argue.

2 MR. SIESS: It wasn't as good as Davis-Besse.

3 MR. MASCIANTONIO: The last issue, A-49,  
4 pressurized thermal shock, Consumers Power submitted  
5 information on its fluency reduction efforts to comply with  
6 the PTS rule.

7 MR. SIESS: Which rule?

8 MR. MASCIANTONIO: 10 CFR 50.61.

9 MR. SIESS: Wasn't it just revised, the final  
10 rule?

11 MR. ELLIOTT: They submitted information for the  
12 proposed revised rule.

13 MR. SIESS: The revised rule.

14 MR. ELLIOTT: Right.

15 MR. SIESS: Which put them up --

16 MR. ELLIOTT: At the top of the list.

17 MR. SIESS: Have we seen copies of what they  
18 submitted?

19 MR. ELLIOTT: Yes, I have.

20 MR. SIESS: Have we seen them? The reason I am  
21 asking is that --

22 MR. ELLIOTT: I was going to present some of this  
23 information if you are interested.

24 MR. SIESS: The thing is that Dr. Shewmon who is  
25 the expert on this is not able to be here today. Is Bill

1 going to be here tomorrow --

2 MR. KERR: Yes.

3 MR. SIESS: We will hear your presentation, and at  
4 least decided if we want the same thing when he's here  
5 tomorrow or whether we can handle it some other way.

6 MR. MASCIANTONIO: The submittal concluded that  
7 the flux reduction achieved to date is insufficient to allow  
8 plant operation to the end of the nominal license term.  
9 Consumers is following the procedures in the PTS rule to  
10 assure adequate lifetime -- vessel lifetime to allow  
11 operation to the end of plant life.

12 The measures being considered are greater flux  
13 reduction, analysis per Reg Guide 1.154, and vessel  
14 shielding. This item, as Barry mentioned, is under staff  
15 review and NRC approval is required for any operation beyond  
16 the PTS screening criteria.

17 MR. SIESS: If you give them an FTOL they may not  
18 get to use it?

19 MR. MASCIANTONIO: Correct.

20 MR. SIESS: If you gave them an FTOL it wouldn't  
21 prevent you from shutting them down anyway.

22 MR. MASCIANTONIO: That's correct. It really has  
23 no bearing on what license they have.

24 MR. SIESS: You used some sort of euphemism there,  
25 that they might not be able to operate until the end of the

1 expected lifetime. I got the impression that under the  
2 revised rule they might not be able to operate next year.

3 MR. ELLIOTT: That's not true.

4 MR. SIESS: When would they hit their limit?

5 MR. ELLIOTT: In 2001.

6 MR. SIESS: With the revised rule?

7 MR. ELLIOTT: With the revised rule. I am going  
8 to go through all of that.

9 MR. SIESS: Just a minute, while I find a piece of  
10 paper. It was 2007 and it backs off to 2001 under the  
11 revised rule. They have six years lopped off of that.

12 MR. ELLIOTT: I don't know where the 2007 came  
13 from, but I know it's --

14 MR. SIESS: The 2007 came from 10 CFR Part --

15 MR. ELLIOTT: The old rule, okay.

16 MR. SIESS: Part 50.61 Reg analysis.

17 MR. ELLIOTT: Maybe the old rule.

18 MR. SIESS: Yes, that's what I said.

19 MR. MASCIANTONIO: Just to conclude --

20 MR. SIESS: When will the screening criteria be  
21 reached under the new rules?

22 MR. ELLIOTT: Two thousand-one.

23 MR. SIESS: That's the same as the end of license  
24 life?

25 MR. ELLIOTT: The license current is 2007.



1 MR. SIESS: Before they were the same, and that's  
2 what I was confused by. You are going to talk more about  
3 this later?

4 MR. ELLIOTT: If you want me to, yes.

5 MR. SIESS: I have some other numbers on here that  
6 I want to check with you. We will come back to this. Go  
7 ahead.

8 MR. MASCIANTONIO: Just to conclude, on the basis  
9 of our evaluation the staff has determined that the timely  
10 application for the full term license was made by Consumers  
11 Power Company. The technical issues and the environmental  
12 issues have been addressed. The provisions of the existing  
13 license have been met. Facility will operate in conformance  
14 with the full term license application.

15 We have reasonable assurance that the activities  
16 authorized by the full term license can be conducted without  
17 endangering the health and safety of the public, and that  
18 those activities will be conducted in compliance with the  
19 regulations of the Commission.

20 The licensee is technically qualified to engage in  
21 the activities authorized by the full term license.

22 MR. CARROLL: How did you make that finding?

23 MR. MASCIANTONIO: The fact that the plant has  
24 been operating for almost 20 years.

25 MR. CARROLL: Maybe they were just lucky.

1 MR. MASCIANTONIO: Twenty years.

2 MR. CARROLL: Agree. Benign and forgiving  
3 technology

4 MR. MASCIANTONIO: Based on these findings the  
5 staff recommends that --

6 MR. CARROLL: I am serious. That is the whole  
7 basis? I am not picking on Consumers at Palisades, but when  
8 you make that finding that the licensee is technically  
9 qualified you just say it must be because the plant has run  
10 for 20 years; is that all?

11 MR. MASCIANTONIO: No. They are meeting all the  
12 present requirements just like any other plant that is  
13 operating under a full term license.

14 MR. HOLIAN: I will also be going over SALP scores  
15 and other indicators that the staff has in judging them from  
16 that aspect.

17 MR. ZWOLINSKI: We will address our inspection  
18 program over the past 15 years.

19 MR. CARROLL: It's all of those things taken  
20 together that decides you guys are technically qualified at  
21 this point in time?

22 MR. HOLIAN: That's correct.

23 MR. SIESS: I guess I am a little confused in how  
24 this is being presented. Is somebody else going to cover  
25 the items in 2.3, plant-specific licensing issues?

1 MR. MASCIANTONIO: Yes. There were two issues  
2 that we wanted to address on that. Brian will address those  
3 issues.

4 MR. SIESS: Okay. What else are you going to  
5 address?

6 MR. HOLIAN: The way we had it planned was, Barry  
7 Elliott would go next talking about pressurized thermal  
8 shock. Then, I would go talking about a couple of plant-  
9 specific activities that are going on, and the operational  
10 history of the plant for specifically the last five years.  
11 Dave Vandewalle from the Palisades plant will speak for  
12 about five minutes.

13 MR. SIESS: Okay.

14 MR. LEWIS: Could I ask a question -- maybe I am  
15 just too attentive to language --

16 MR. SIESS: If it's a stupid question you can ask  
17 it.

18 MR. LEWIS: It's a bad question, but I will ask it  
19 anyway. I am sensitive to the use of words. The viewgraph  
20 said the public health and safety will not be endangered,  
21 which I find an interesting choice of words. It doesn't say  
22 can be operated without undue risk, just can be operated  
23 without risk. That can't be true, of course.

24 Then I looked at the SER, and the SER has even  
25 classier words. It says the issuance of the FTOL will not

1 be inimical to the health and safety of the public, which I  
2 find a very interesting choice of words. Are these in some  
3 way traditional, or is this being treated in a different way  
4 from the issuance of an original operating license; and why  
5 are these statements which are on the face of them untrue,  
6 part of the documentation? Is nobody sensitive to what the  
7 meaning of words is?

8 MR. MASCIANTONIO: To my knowledge, the words are  
9 no different than as being used in Palisades.

10 MR. LEWIS: You mean all licenses are issued with  
11 the statement that there is no risk? I can't believe that.

12 MR. SIESS: The requirement is, and it's a finding  
13 the ACRS makes, that there's reasonable assurance it can be  
14 operated without undue risk to the health and safety of the  
15 public.

16 MR. LEWIS: That's why I am raising the question.  
17 This is different.

18 MR. SIEGEL: All I can address is Millstone and  
19 Ginna, and the wording in these are both -- both these SER's  
20 are essentially identical to what is in there. I assume --  
21 and I don't know the history of where it came from -- I  
22 assume it was done with the assistance of our legal counsel  
23 with regard to the use of those words. I honestly do not  
24 know.

25 MR. LEWIS: That gives me a great deal of comfort,

1 but I will manage to conceal the level of the comfort.

2 [Laughter.]

3 MR. LEWIS: Seriously, the --

4 MR. SIEGEL: I could use the statement that you  
5 proved it before so we figured you would prove it again.

6 MR. LEWIS: This is a serious issue. You are  
7 making a legal statement which is easily challengeable,  
8 which just isn't true.

9 MR. SIESS: Hal, I am not so sure. It doesn't say  
10 that the operation of the plant or continued operation of  
11 the plant will not be inimical. It says the issuance of the  
12 FTOL will not be inimical. I can't argue with that  
13 statement because I think the issuance of the FTOL has no  
14 effect whatsoever on the health and safety.

15 MR. LEWIS: I understand. If that were the staff  
16 position and stated specifically, I probably wouldn't have  
17 asked my question.

18 MR. SIESS: It says the issuance of the --

19 MR. LEWIS: I understand that's what it says. The  
20 viewgraph says something different.

21 MR. SIESS: That's once removed.

22 MR. LEWIS: I am trying to -- I think that if this  
23 is the way it was done for the other plants it would pay to  
24 find out what the history is. If the Commission goes on  
25 record with a statement that there is no risk in nuclear

1 power, the Commission is in deep trouble.

2 MR. KERR: Notice though that this slide does not  
3 say that public health and safety will not be endangered.  
4 It says that the staff review has determined that. That's  
5 quite a different thing.

6 MR. LEWIS: It also says that the staff review has  
7 determined that Palisades has been operating since 1971, and  
8 I am proud of them for having found that out. It is sort of  
9 a mixed bag, the viewgraph. I am interested in the real  
10 words of the SER.

11 MR. SIESS: The SER though, there's nothing wrong  
12 with that.

13 MR. LEWIS: I know. If you read it in the narrow  
14 sense --

15 MR. CARROLL: You are reading six. Read four.

16 MR. LEWIS: That's right. III-4 is even more  
17 explicit.

18 MR. SIESS: That one, I have a problem with.

19 MR. LEWIS: I think it's worth looking back at  
20 these words. These are legal documents.

21 MR. SIEGEL: The Commission is not going to vote  
22 on this. I don't know if you are aware of the process or  
23 not. On these, the Commission is made aware of the fact  
24 that we are going to issue the license and Dr. Murley has  
25 the authority to sign off on the license. It does not

1 require a vote' by the Commission to approve the conversion.

2 MR. SIESS: It does require review by the ACRS.

3 MR. SIEGEL: That's correct.

4 MR. LEWIS: We have the right to --

5 MR. SIESS: Who reads that, Dr. Murley?

6 MR. SIEGEL: I would -- yes, I would assume so.

7 Until we get a letter from the ACRS a license would not be  
8 issued. I would assume that unless it was favorable we would  
9 not issue it.

10 MR. LEWIS: Of course, a letter from the ACRS  
11 would conceivably -- I won't say it will -- could  
12 conceivably contain a comment saying in spite of the fact  
13 that the assertion above is demonstrably false, in which  
14 case I think someone would probably notice.

15 MR. SIESS: The ACRS doesn't usually comment on  
16 the staff's review and announce our decision. It's in the  
17 same language that we use on operating license. In my draft  
18 and in the previous letters that we wrote, we did not make a  
19 finding about it endangering the health. We just simply  
20 found that there is reasonable assurance that it can be  
21 operated without undue risk. Don't ask us what either of  
22 those terms means.

23 MR. LEWIS: I have asked it often and people sneer  
24 at me. Flat statements -- that's why I raised the point.

25 MR. KERR: Incidentally, in the Dresden SER, the

1 language is there is reasonable assurance that the  
2 activities authorized with the FTOL can be conducted without  
3 endangering health and safety of the public.

4 MR. SIESS: That's what it says in Palisades.  
5 Palisades is the same in the final version.

6 MR. LEWIS: I have more concern for the meaning of  
7 words that most of us, but I think it's good to use the  
8 words that mean what you say.

9 MR. MARSH: Why don't we just look up the history  
10 for you and see if we can get back to you on where it came  
11 from, whether it has some derivation of the regulations or  
12 what rather than spending any more time on it.

13 MR. CARROLL: You might, between now and tomorrow,  
14 if you can, get somebody in OGC if they feel comfortable  
15 with these words or whether they sort of evolved --

16 MR. LEWIS: I might predict the future by saying  
17 that if that isn't clarified by tomorrow, it could  
18 conceivably come up at the full meeting tomorrow. In fact,  
19 I would almost guarantee that it would.

20 MR. MASCIANTONIO: Barry Elliott will address the  
21 pressurized thermal shock issue.

22 MR. ELLIOTT: My name is Barry Elliott, I am with  
23 the Materials Engineering Branch of NRR. I will be  
24 discussing the pressurized thermal shock issue and the  
25 revised PTS rule and how it affects Palisades.



1 [Slide.]

2 MR. SIESS: Excuse me. Is this a presentation  
3 that you had made previously to Materials and Metallurgy  
4 Subcommittee?

5 MR. ELLIOTT: No, it is not. This is the first  
6 time that I am giving it.

7 MR. SIESS: You just have the wrong title on it.  
8 I just wanted to be sure, because if you had presented it to  
9 that Subcommittee I wouldn't have to listen as much.

10 MR. ELLIOTT: No, this is brand new. The proposed  
11 pressurized thermal shock rule, 10 CFR 50.61 will have the  
12 same screening criteria as we presently have. Plates and  
13 axial welds, the RT PTS will limit it to 270, and for  
14 circumferential welds, the RT PTS will be limited to 300.

15 The revised rule will have an RT PTS, one in the  
16 same formula. The difference will be in the chemistry  
17 factor which is CF, and the fluency factor and the margin  
18 terms. These new terms were derived from the Reg Guide 1.99  
19 Rev.2 and are currently being implemented into the PTS rule.  
20 An additional requirement in the new rule will be to assess  
21 the operating temperature and surveillance test results to  
22 determine their effect upon the RT PTS. This came from our  
23 review of the Yankee Row reactor vessel.

24 The NRC may approve operation of values of RT PTS  
25 above the screening criteria.

1 MR. SIESS: The screening criteria mean what?  
2 Meaning when you start thinking about or when you stop  
3 operating?

4 MR. ELLIOTT: It is a screening criteria that --  
5 If you reach it, you have to demonstrate to us that you can  
6 continue to operate.

7 MR. SIESS: You can use the simple procedures to  
8 get it, and if it doesn't look right you can go back and try  
9 another way of doing it?

10 MR. ELLIOTT: If initially at the end of the  
11 license you can't meet the screening criteria, we strongly  
12 recommend flux reduction. Then if you can't meet flux  
13 reduction, we have a probabilistic method of evaluating the  
14 plant and its acceptability to pressurized thermal shock.

15 The first attempt is to try to meet the screening  
16 criteria with flux reduction, and the second is that if you  
17 can't meet the flux reduction look at it probabilistically  
18 to see what the risks are.

19 MR. SIESS: The screening criteria now is 350  
20 degrees fahrenheit for circumferential welds. You compare  
21 the predicted end of life value with that.

22 MR. ELLIOTT: Yes, that's exactly what you do for  
23 a circumferential weld. For an axial weld you would compare  
24 it to 270 for a plate, you would compare it to 270.

25 MR. SIESS: If Palisades is going to hit that

1 point at -- end of life is 2007, and under the revised rule  
2 that is this calculation, they would hit the 300 at 2001;  
3 right?

4 MR. ELLIOTT: It is not the circumferential weld  
5 that is limiting, it's the axial weld. I will get to that  
6 eventually. Axial weld is limiting.

7 MR. SIESS: Okay, go ahead.

8 [Slide.]

9 MR. ELLIOTT: This is a drawing looking down at  
10 the core of the Palisades reactor vessel. The beltline of  
11 the reactor vessel has two shell segments which are made of  
12 three shelves each. They have three longitudinal axial  
13 welds and there is one circumferential weld which combines  
14 the two shells. Basically this is off the center line of  
15 the vessel at zero degree orientations with respect to the  
16 core with 30 degree orientations with respect to the core,  
17 the axial welds.

18 The current -- Palisades currently uses a low  
19 leakage core in which they put the thrice burned fuel on the  
20 outside of the core, the periphery. In the thrice burned  
21 fuel, they are using zircaloid hafnium rods in the eight  
22 guide tube locations. This reduces the flux to the critical  
23 welds.

24 MR. SIESS: While you have that slide on, would  
25 you say something about the thermal shield that ain't there?

1 Where was it, and does it have any bearing on the problem  
2 they have now?

3 MR. ELLIOTT: It has a bearing on the problem, it  
4 increased the flux.

5 MR. SIESS: At the time they took that ought, I  
6 thought they made some calculations that either it would not  
7 increase the flux or wouldn't increase it very much.

8 MR. ELLIOTT: I will have to go back and look at  
9 that in a little more detail. If you take out stainless  
10 steel you are taking --

11 MR. SIESS: I know, but they knew they were  
12 increasing the flux but it wasn't a problem then; is that  
13 right?

14 MR. ELLIOTT: Back then they probably had the old  
15 PTS rule, and they didn't have a big problem. It's the new  
16 PTS rule that --

17 MR. SIESS: I don't think we had any PTS rule  
18 because that thermal shield was taken out within a year or  
19 two of operation.

20 MR. LOIS: Dr. Siess, at the time that this  
21 evaluation was made the calculation techniques were not up  
22 to standards that we have today. Probably that evaluation  
23 was performed in a manner which was not as accurate and is  
24 probably somewhat misleading.

25 MR. SIESS: You mean they didn't have the ability

1 then to compare an inch and one-half of steel with an inch  
2 and one-half of water?

3 MR. LOIS: We did have the ability. However, it  
4 was not that accurate because of penetration of neutrons  
5 from the edge of the core to the pressure vessel is quite  
6 significant. The reduction in the absolute value of the  
7 flux is by about seven or eight orders of magnitude. The  
8 exact phenomena are very difficult to calculate.

9 Now we have -- we have developed them actually --  
10 for the needs of the pressurized thermal shock issue in the  
11 early 1980's. We have good quantified uncertainty codes  
12 such that we know exactly what the results are.

13 MR. SIESS: It wasn't that the difference was  
14 wrong but that the basic calculation was

15 MR. LOIS: Right. The difference between these  
16 two calculations -- in other words substituting water for  
17 steel is not very much. The difference there consists  
18 primarily in the number of neutrons which are above 1 MEV.  
19 That is even a more difficult calculation to do accurately.  
20 The total number of neutrons that reach the plate are not  
21 that different. However, the total number of neutrons that  
22 reaches the pressure vessel at both 1 MEV which is the ones  
23 that really count, those are somewhat different. That is  
24 not a great deal.

25 There were a number of difficulties involved in

1 site examination which was not able to do accurately in  
2 those days.

3 MR. SIESS: It wouldn't help if they put the  
4 thermal shield back in.

5 MR. LOIS: It would help a little, not a great  
6 deal.

7 MR. SIESS: The last I heard it was still there.

8 MR. KERR: The water is probably better than the  
9 thermal shield for fast neutrons.

10 MR. LOIS: Dr. Kerr is correct. However, the  
11 steel removes more neutrons above 1 MEV than the water does.  
12 That is where the difference lies.

13 MR. SIESS: Thank you.

14 [Slide.]

15 MR. ELLIOTT: Cycle 7, the licensee utilized the  
16 regular out/in fuel scheme, and this is basically the flux  
17 for the critical -- for the welds and base metal. Cycle 8,  
18 the licensee went to a low leakage core and used thrice  
19 burned stainless steel shielded assemblies on the periphery.  
20 This is the reduction in flux. On the ninth fuel cycle, as  
21 I said before, they are using thrice burned assemblies with  
22 zircaloid clad hafnium rods in the eight guide tube  
23 locations around the periphery of the core.

24 MR. SIESS: I am trying to -- the first three  
25 columns are flux, right?

1 MR. ELLIOTT: Right.

2 MR. SIESS: It goes from 474 to 208.

3 MR. ELLIOTT: Right.

4 MR. SIESS: In that neighborhood. Cycle 9 goes  
5 even lower.

6 MR. ELLIOTT: Right.

7 MR. SIESS: Have the calculations been made to end  
8 the life using those new --

9 MR. ELLIOTT: Yes, it has. We are getting there.

10 [Slide.]

11 This is a slide for the axial welds and  
12 circumferential welds. It tells you the screening criteria.  
13 The critical elements are the copper and nickel in the welds  
14 and the plates. Based on the copper and nickel I show the  
15 chemistry number for each one of the materials. Finally, to  
16 reach this screening criteria the axial welds would require  
17 this amount of fluency, circumferential weld that fluency,  
18 and lower shell plate the fluency to reach its screening  
19 criteria.

20 When the data will reach the screen criteria is  
21 indicated on the far right column. The 2040 should be  
22 greater than 2040.

23 MR. SIESS: Leave that up there. The 2001 that  
24 you mentioned earlier, this includes the flux improvement?

25 MR. ELLIOTT: Yes, it is, considering cycle 9

1 continuing until 2001.

2 MR. SIESS: What is the nine in front of 2001?

3 MR. ELLIOTT: September. September, 2001.

4 MR. SIESS: You really know it that well?

5 MR. ELLIOTT: That's the calculation.

6 MR. SIESS: On the question of knowing it that  
7 well, is the chemistry that well known here?

8 MR. ELLIOTT: Yes. In this case we know the heats  
9 of wire. This wire is in other plants, and we have a lot of  
10 samples to look at.

11 [Slide.]

12 As I talked about before, our experience at Yankee  
13 Row is that you have to be very careful of RT PTS formula  
14 was a nice formula but you have to look at how the plant  
15 operates, temperature and surveillance results. This chart  
16 shows the critical welds for Palisades. The axial welds  
17 were made with RAC03, two different heats of wire with  
18 nickel added into the weld puddle. We used Linde 1092 flux,  
19 and these are the properties for that material.

20 The circumferential weld was made with a different  
21 type of wire, it was a MILB4 modified heat 27204, Linde 1092  
22 flux. The difference is that in the MILB4 modified the  
23 nickel is in the wire and is not added as a separate  
24 electrode.

25 The surveillance weld is a RAC03 wire heat number



1 3277 with nickel added. It is not in the reactor vessel at  
2 Palisades. It is just a surveillance weld.

3 MR. SIESS: What do you mean by surveillance weld?

4 MR. ELLIOTT: In other words, it is a weld that  
5 they made specifically to put in their capsule in the  
6 vessel. They pull out the capsules periodically to test  
7 them. This weld pretty much represents the axial weld. It  
8 does not represent the circumferential weld. I would like  
9 to have seen the actual heat of wire in the surveillance  
10 capsule but it is not. We can infer from these surveillance  
11 results some information which is useful.

12 [Slide.]

13 This is the surveillance results from the two  
14 capsule withdrawn from Palisades. There are two capsules.  
15 The fluency or capsules received is indicated. They are  
16 both transverse and longitudinally in CHARPY specimens.  
17 There are weld metal specimens. Again, as I told you, weld  
18 metal is not exactly from their -- the exact heat of wire  
19 from their vessel but it is representative of their axial  
20 welds.

21 If you compare the increase in reference  
22 temperature measured from irradiation from the CHARPY test  
23 and compare it to the values predicted by the Reg Guide, it  
24 shows that these surveillance results, both for the plain  
25 and weld metal, is accurately predicted by the Reg Guide.

1 The Reg Guide methodology is sort of proven out.

2 MR. SIESS: That's true for W-290. How do you  
3 reach that conclusion on A-240?

4 MR. ELLIOTT: On A-240?

5 MR. SIESS: Yes.

6 MR. ELLIOTT: The increase in temperature measured  
7 was 30 degrees lower than the Reg Guide predicted, so the  
8 Reg Guide should be conservative for the mean value.

9 MR. SIESS: You said correct before.

10 MR. ELLIOTT: Thirty degrees in this test is  
11 pretty close. The standard deviation here is 24, one  
12 segment. Being off by 30 from one point in this test is not  
13 that much.

14 MR. SIESS: The figures that we have been looking  
15 at predicted end of life of screening are based on the Reg  
16 Guide?

17 MR. ELLIOTT: Yes, it was.

18 [Slide.]

19 I wanted to show you one more piece of information  
20 that I found a few minutes ago. It turns out that the MILB+  
21 modified heat 27204 weld metal is in the surveillance  
22 program for Diablo Canyon. It is the exact heat of wire  
23 which is in the Palisades reactor vessel. Again, if you  
24 compare the increase in reference temperature measured  
25 versus the value predicted by the Reg Guide, the Reg Guide

1 is conservative.

2 This supports the Reg Guide that the Palisades  
3 appears -- the Palisades materials are conservatively  
4 predicted by the Reg Guide.

5 MR. SIESS: That's not going to be exactly a  
6 surprise, is it?

7 MR. ELLIOTT: It was a surprise for Yankee Row,  
8 and that's why I brought it up. You remember Yankee Row,  
9 their surveillance results were very -- much higher than the  
10 mean value. In fact, it was much higher than the mean value  
11 plus two standard deviations.

12 MR. SIESS: Than the Reg Guide.

13 MR. ELLIOTT: Than the Reg Guide. That's why I  
14 brought this up. This is one of the changes that we are  
15 making in the PTS rule, is to look at the surveillance  
16 results and operating temperature.

17 MR. SIESS: You take the surveillance results or  
18 the Reg Guide, whichever is larger.

19 MR. ELLIOTT: Excuse me?

20 MR. SIESS: Surveillance results or the Reg Guide  
21 predictions, whichever is larger.

22 MR. ELLIOTT: The current rule just says to use  
23 the PTS rule, and then we have to make an adjustment for the  
24 surveillance. If it was much higher then we would use the  
25 higher surveillance results.

1 MR. SIESS: Okay.

2 [Slide.]

3 MR. ELLIOTT: In conclusion, Palisades  
4 surveillance data indicates that radiation embrittlement  
5 predicted by Reg Guide 1.99 Rev. 2 and proposed PT rule  
6 accurately predicts radiation embrittlement to Palisades  
7 beltline materials. With current flux reductions, Palisades  
8 will reach the PTS screening criteria in 2001. To operate  
9 until 2007, licensee is evaluating greater flux reduction,  
10 doing a Reg Guide 1.154 probabilistic fracture mechanics  
11 analysis, and are evaluating vessel shielding which will be  
12 welding of neutron pads onto the core support barrel.

13 MR. SIESS: That is replacing water with steel.

14 MR. ELLIOTT: Right, but it would reduce the flux  
15 in particular in key locations.

16 MR. SIESS: The flux reduction from cycles 8 and 9  
17 was done by what, moving fuel?

18 MR. ELLIOTT: Yes. Seven was an in/out pattern.  
19 Then in Cycle 8 they used thrice burned fuel in the  
20 periphery which would change the fuel pattern. In addition,  
21 they used stainless steel on certain assemblies. It  
22 combined two things in Cycle 8.

23 Cycle 9 they used the same fuel pattern which is  
24 thrice burned fuel on the periphery which reduces your flux,  
25 but in addition, used hafnium rods in certain assemblies.

1 MR. SIESS: On that figure where you showed the  
2 fuel layout, you have two's and three's. It says that the  
3 three's are thrice burned, and could I assume that the two's  
4 are twice burned?

5 MR. ELLIOTT: Yes, they are.

6 MR. CARROLL: Do they close down at the end of a  
7 cycle?

8 MR. ELLIOTT: No, they do not.

9 MR. CARROLL: They never have and they don't  
10 intend to?

11 MR. ELLIOTT: They have limitations on -- I talked  
12 to them about that.

13 MR. CARROLL: Why did you do that?

14 [Laughter.]

15 MR. ELLIOTT: They have limitations. They cannot  
16 go below -- on the tech specs they cannot go below 525.

17 MR. SIESS: This is temperature.

18 MR. ELLIOTT: Yes. The problem that we have with  
19 Yankee Row is that they coast down to 490 or even lower.  
20 The Palisades people have a limitation in their tech specs,  
21 they cannot be critical below 525.

22 MR. SIESS: If they can't reduce the flux and they  
23 don't do anything else, then in 2001 they would shut down.

24 MR. ELLIOTT: The rule says within three years of  
25 reaching the screening criteria you have to justify

1 continued operation. The justification for continued  
2 operation, if they couldn't reduce flux -- I talked to them  
3 and they think they can. They think that the --

4 MR. SIESS: I know, but let's just -- don't do  
5 nothing.

6 MR. ELLIOTT: If they don't do anything, three  
7 years prior to reaching the screening criteria they have to  
8 justified continued operation, and they would have to do a  
9 probabilistic fracture mechanics evaluation to the Reg  
10 Guide.

11 MR. SIESS: To go those last three years?

12 MR. ELLIOTT: No. They can go much further than  
13 2001, they are going to go to 2007 or whatever.

14 MR. SIESS: Let's postulate do nothing. That  
15 means that they could run to 2001, period.

16 MR. ELLIOTT: That's right.

17 MR. SIESS: If they want to run past 2001 --

18 MR. ELLIOTT: They have to do something else.

19 MR. SIESS: -- they can either reduce their shift,  
20 they can come back with better data, fracture mechanics  
21 analysis, probabilistic -- things get fuzzier and fuzzier.

22 MR. LEWIS: Can I ask a trivial question? This  
23 seems to be my afternoon for trying to understand the  
24 meaning of words. Your last viewgraph said that the Reg  
25 Guide accurately predicts the embrittlement and that's

1 because the Reg Guide predicted 145 degrees and the  
2 surveillance results showed 110 degrees. By accurately, I  
3 assume you mean it over-estimates.

4 I wonder if the Reg Guide had predicted 300  
5 degrees and surveillance showed 110 it would still be  
6 accurate?

7 MR. ELLIOTT: It wouldn't be accurate, but it  
8 would be conservative in that case.

9 MR. LEWIS: The word used was accurate.

10 MR. ELLIOTT: Accurately -- 30 degrees here is --

11 MR. KERR: He discussed this while you were out.

12 MR. LEWIS: Forgive me.

13 MR. KERR: Within one standard deviation he says.

14 MR. SIESS: It's more complicated than that. He  
15 was countering the Oyster Creek Case, where the Reg Guide  
16 seemed to be less conservative than the surveillance.

17 MR. LEWIS: I understand that, but accurate means  
18 the sign and not the number.

19 MR. ELLIOTT: I was clarifying -- I was showing  
20 the important point is to compare this with our Yankee Row  
21 experience.

22 MR. LEWIS: No, I understand. I heard you say  
23 that.

24 MR. ELLIOTT: We talked about Yankee Row and it  
25 had a different experience, where the PTS rule was non-

1 conservative. That's why Yankee Row had trouble.

2 MR. LEWIS: I understand all of that. The thing  
3 that I am trying to understand is that by accurate you  
4 simply mean it had the right sign.

5 MR. KERR: No, he said that it meant it was within  
6 30 degrees which is pretty good in this --

7 MR. SIESS: That's not --

8 MR. LEWIS: Actually it wasn't, it was 35.

9 MR. SIESS: What he means by accurately is that it  
10 is in the right direction and it's not so far off that he's  
11 worried about it.

12 MR. ELLIOTT: That's right.

13 MR. SIESS: If it was twice as big you would  
14 probably get an argument anyway. Is that all?

15 MR. ELLIOTT: That's all I have.

16 MR. CARROLL: Any update on Yankee Row, as long as  
17 the subject has come up.

18 MR. ELLIOTT: It is still operating. We are still  
19 working on inspection.

20 MR. SIESS: If I am not mistaken, Yankee Row which  
21 somebody is inquiring about, received its full term  
22 operating license in 1961. Apparently, whether or not the  
23 plant has an FTOL doesn't seem to help.

24 MR. MARSH: Before we get started on this one,  
25 this is Tad Marsh from the staff. We tried to find the



1 derivation of the words that we used in the conclusion of  
2 the safety evaluation and as you can tell, I have the book  
3 out in front of me, and that is from whence it comes  
4 directly.

5 MR. SIESS: Where?

6 MR. LEWIS: I saw that.

7 MR. MARSH: Quoted directly.

8 MR. LEWIS: That's CFR 50.57.

9 MR. MARSH: It's a direct quote, right out of the  
10 book.

11 MR. LEWIS: There's a problem within the rule.  
12 You are not to blame.

13 MR. SIESS: What is 50.57 --

14 MR. MARSH: I thought you were asking us --

15 MR. SIESS: What is the heading --

16 MR. LEWIS: No, that's right.

17 MR. SIESS: Unless you explain what you are  
18 talking about I will call you out of order. Tell me what  
19 you are quoting, please.

20 MR. MARSH: All right, 50.57 in the regulations.

21 MR. SIESS: Heading. Numbers don't mean a thing.

22 MR. MARSH: If you will let me answer your  
23 question, I will be glad to.

24 MR. SIESS: I have asked it four times and you  
25 repeat 50.57. Get to the point, sir.

1 MR. MARSH: 10 CFR 50.57 is titled the Issuance of  
2 an Operating License. It follows 10 CFR 50.56, which is  
3 titled Conversion of a Construction Permit to a License or  
4 Amendment of a License. That is on page 587.

5 MR. SIESS: Which subsection?

6 MR. MARSH: The conclusions that are in the safety  
7 evaluation report -- there are about five of them that are  
8 quoted directly from 50.57.

9 MR. SIESS: I see what you are reading now.  
10 Without endangering -- and is the one about inimical in  
11 there?

12 MR. MARSH: Yes.

13 MR. LEWIS: I'll be darned.

14 MR. LEWIS: I conclude that you are absolved.

15 MR. MARSH: I wanted to make sure that you knew  
16 where it came from.

17 MR. LEWIS: No, I understood and I appreciate  
18 that. The sin was committed before you repeated it.

19 MR. SIESS: Complete agreement with the law.

20 MR. HOLIAN: The rest of the agenda would be  
21 myself, Brian Holian, the project manager. And then we  
22 would hear from the licensee I expect five minutes, and then  
23 another five minutes for timing sake.

24 [Slide.]

25 MR. ZWOLINSKI: Excuse me, Dr. Siess. Is there a

1 question on the table regarding Yankee Row and the status of  
2 PTC that you would like the staff to address?

3 MR. SIESS: Not in this meeting.

4 MR. ZWOLINSKI: Thank you.

5 MR. HOLIAN: My name is Brian Holian, Project  
6 Manager. I have been in that position since about April of  
7 this year. Palisades has had about three project managers  
8 over about a ten year period, so it's been pretty stable  
9 monitoring by headquarters staff. The comments I have on  
10 the operational history of the Palisades plant are called  
11 from senior staff management and the region management.

12 MR. SIESS: Do I have piece of paper with your  
13 name and phone number on it.

14 MR. HOLIAN: No. you do not. I don't believe  
15 Armand added it on to the original one.

16 MR. SIESS: Would you repeat your name, please?

17 MR. HOLIAN: Yes. My name is Brian Holian. The  
18 phone number is 492-1344.

19 MR. SIESS: Thank you. Go ahead.

20 MR. HOLIAN: Palisades, historically is an average  
21 plant. They have shown a marked improvement over the course  
22 of the last two to three years, both material condition of  
23 the plant and their operational runs.

24 [Slide.]

25 The first slide I would like to show you, and we

1 will talk through some of the years, is the capacity factor  
2 of the Palisades plant. Once again, we have the first full  
3 scale large combustion engineering plant. They started off  
4 well in 1972 and 1973, but they started off with phosphate  
5 control, coordinate phosphate control for their steam  
6 generators. In the years of 1973 and 1974 they had outages  
7 that ended up plugging over 2,600 steam generator tubes.

8 They shut down in 1974 there and had an extended  
9 shutdown to plug some additional tubes and also to change  
10 over their phosphate control to all volatile chemistry  
11 control from the steam generators. It is out of that aspect  
12 there that they continued having minimal steam generator  
13 plugging in the years that followed but changing over the  
14 chemistry control arrested the original problems that they  
15 had with the tubes.

16 Their capacity factor for 1972 to 1990, as you can  
17 see on the graph, shows an average of 47 percent. The plant  
18 operated pretty well as I said until 1984, when they again  
19 shut down for an extended outage where they plugged an  
20 additional approximately 300 steam generator tubes. It was  
21 at this time that they were already looking at the fact that  
22 for the future runs of their plant they would have to  
23 replace the steam generators. Combustion Engineering at  
24 this time, had already started production of two replacement  
25 generators for the Palisades plant.

1           In 1985 they had a very good run, and that  
2 culminated in a refueling outage in 1986. The next bar  
3 chart you see in 1986 is the fact that they were shut down  
4 for quite a portion of that year. In the start up following  
5 the good production run in 1985 they had some material  
6 problems; feed isolation valve didn't shut, reactor trip  
7 feed isolation valve didn't shut, atmospheric dump valves  
8 shut open. The staff took a close look at the material  
9 condition of their plant and they were down for the  
10 remainder of that year correcting problems that they had.

11           It was in October of 1986 that the senior  
12 management at the NRC placed Palisades plant on the problem  
13 plant list. They were down until -- they stayed shut down  
14 and in June of the next year, 1987, they started up and had  
15 a pretty good run after that. In November of 1987 they were  
16 removed from the problem plant list.

17           In December of 1989 again, they had a steam  
18 generator outage. They had a total of eight steam generator  
19 forced outages due to leaking steam generator tubes. In  
20 December of 1989 they went in and plugged an additional 100  
21 tubes I believe, and laid two limits on themselves to come  
22 out of that outage. One was a reduced leakage limit to  
23 monitor in their tech specs. Also, they volunteered an 80  
24 percent power limit on themselves. They ran that way  
25 through 1990 and shut down in September, September 15, 1990

1 for a five month outage that they are in right now.

2 [Slide.]

3 As I mentioned, the Palisades plant is an average  
4 plant. They have also been categorized as a checkered in  
5 plant, an average plant with their ups and down. When you  
6 look overall, the next slide takes a look that Palisades has  
7 historically had a large number of small or short production  
8 runs. As you can see in the bottom slide, this does not  
9 give any historical perspective but the next slide will, and  
10 it's set up similar to this slide.

11 [Slide.]

12 You can tell that they have had a majority of less  
13 than 20 day power runs. Up at the top the information that  
14 is given is that the 90.3 day run which was in 1990  
15 culminated in the September 15 shutdown for the steam  
16 generator replacement refueling outage was their seventh  
17 longest run in history.

18 The next slide gives a little bit more information  
19 on where they have been in the last four to five years.

20 [Slide.]

21 It's a little bit confusing, but I will go through  
22 the agenda. Once again, the axis are the same. There is  
23 your less than 20 day run that we used as a marker before.  
24 What you see is that in 1987 their runs are still relatively  
25 short. The majority of them are less than 20 days all the

1 way down to less than five days, and that's the number of  
2 runs on the y-axis. In 1988 and in 1989 with the cross-  
3 stitch, you can see that in the last few years they have  
4 bettered the material condition of their plant and have had  
5 better operating runs. In 1989 it was a 155 day run here.  
6 In 1990 they had two runs in the middle of the screen there.

7 Some of the problems they had early in their  
8 history besides the steam generator tube problems were some  
9 EHC tubing problems that were the cause of them shutting  
10 down for a number of outages at that time.

11 MR. CARROLL: What kind of tubing problems?

12 MR. HOLIAN: They had some EHC tubing problems  
13 that the fasteners were incorrect and it took them a couple  
14 of cycles to resolve that. That was early in their history.  
15 Electric hydraulic control problems.

16 MR. CARROLL: That's a Westinghouse machine, isn't  
17 it?

18 MR. HOLIAN: Westinghouse turbine, correct.

19 [Slide.]

20 The next graph gives you a historical chart since  
21 1984 of the number of LER's submitted. Once again, that is  
22 probably an average around here. In 1986 and 1987 when they  
23 had a lot of material condition problems that were  
24 identified by the staff and by themselves, you can see an  
25 increase in LER's. In 1988 through 1990 they were very

1 close to industry average, approximately 20 LER's.

2 The next slide gives the SALP history over the  
3 last five years. I categorized Palisades as an average  
4 plant, particularly that is what that graph shows. A lot of  
5 two's overall. In the middle of the chart it shows in  
6 maintenance and, once again, corresponding to that time  
7 where the material condition of the plant fell below par in  
8 1985 to 1987.

9 They are due for another SALP, SALP cycle ten.  
10 The SALP board will have pre-board meetings in December of  
11 this year with the SALP report probably coming out in  
12 January or February of next year. Their last SALP had a  
13 variety of two's and one's where a couple of the arrows are  
14 marked with improving trends. Just for the ACRS,  
15 preliminary review of the operating history both from the  
16 region and headquarters doesn't show a marked difference in  
17 their 1990 performance than these numbers.

18 MR. KERR: Remind me what E/TS and SA/QV mean.

19 MR. HOLIAN: Engineering, technical support.  
20 Safety assessment and qualify verification.

21 MR. KERR: Thank you.

22 MR. HOLIAN: Those were new categories that were  
23 picked up in 1987 and 1988.

24 Plant specific activities that I would like to  
25 talk about relatively shortly, these are two of the major



1 activities that are ongoing now with Palisades from the  
2 staff perspective and their perspective. The steam  
3 generator placement -- they shut down in September for this  
4 five month outage -- refueling and replacement of two steam  
5 generators. They are performing it under 10 CFR 50.59.

6 There's a second steam generator placement to be  
7 formed under 10 CFR 50.59 and there have been eight steam  
8 generator placements to date.

9 MR. SIESS: Eight plants or eight steam  
10 generators?

11 MR. HOLIAN: Eight plants.

12 MR. CARROLL: How are they performed?

13 MR. HOLIAN: They were performed, the first seven  
14 of them, I have a back up slide on that I could show you if  
15 you are interested. Basically, the differences that I  
16 highlighted was that the last one prior to Palisades came in  
17 under 10 CFR 50.59 which means they are performed without  
18 prior staff review. The first seven came in with a package  
19 for the staff to review.

20 MR. SIESS: Where do they cut them?

21 MR. HOLIAN: Where do they cut?

22 MR. SIESS: Yes, they have a big hole. Did they  
23 take the whole steam generator out or just the bottom?

24 MR. HOLIAN: No, they didn't cut the steam  
25 generators. The whole steam generators came out in one

1 piece.

2 MR. SIESS: Is this the first plant that has done  
3 that?

4 MR. HOLIAN: No. There has been some replacements  
5 that have come out, and they have been able to come through.  
6 The first CE plant like this with the large steam  
7 generators, the Westinghouse steam generators have been able  
8 to fit through their containment opening accesses. A couple  
9 of plants did choose to cut them up inside containment and  
10 replace them.

11 MR. SIESS: They just replaced the tubes.

12 MR. HOLIAN: Correct.

13 MR. SIESS: They didn't replace the upper part.

14 MR. HOLIAN: Correct.

15 MR. SIESS: The welds here were all made in the  
16 piping then?

17 MR. HOLIAN: That's correct.

18 MR. SIESS: The nozzles.

19 MR. HOLIAN: Correct. The two significant issues  
20 that are -- I have a backup slide showing different plants  
21 if you would like to see that.

22 MR. CARROLL: That's okay.

23 MR. HOLIAN: The two significant issues that were

24 --

25 MR. CARROLL: I guess I did have one follow up

1 question. If I sent you in a package did you respond to it  
2 in some -- by some vehicle, SER or something?

3 MR. HOLIAN: Specifically on a Palisades  
4 replacement?

5 MR. CARROLL: No.

6 MR. HOLIAN: On the first six steam generator  
7 replacements that's correct. The package came in from the  
8 licensee saying we plan on doing this and at that time, a  
9 lot of the review was based on man-REM, on what would happen  
10 with the project and other things. The staff reviewed that  
11 and sent out a letter approving their steam generator  
12 replacement package.

13 Indian Point came through with one. After the  
14 lessons were learned they decided that it was possible to do  
15 it on 10 CFR 50.59, and the staff would review it by the  
16 inspection process which is what is ongoing now.

17 Two differences with Palisades or at least unique  
18 aspects of the Palisades steam generator replacement is once  
19 again the containment opening. The first time in this  
20 country that the containment has been reopened in that  
21 aspect in an approximately 30 by 30 foot hole for the steam  
22 generators to be replaced or to be transferred through.  
23 That was done overseas at a nuclear reactor.

24 MR. SISS: Sweden, to be exact.

25 MR. HOLIAN: Correct. The narrow gap welding

1 process which is a code approved or code reconciliatory  
2 process went through on the narrow gap welding process which  
3 is a new automated welding technique to be used. Both of  
4 those were used during this outage at the steam generator  
5 replacement -- for this steam generator replacement.

6 Piping modifications in particular, that just  
7 refers to the main steam piping. The new generators are  
8 almost exact to the old generators. They had a main steam  
9 flow restricter that was integral to the top of the  
10 generator, and that just caused some main steam piping mods  
11 to be done.

12 Transient accident analysis were redone by the  
13 Palisades staff and reviewed by the NRC staff. Steam  
14 generator storage is similar to the other steam generators  
15 that are stored on-site in a concrete building that was  
16 built for that purpose.

17 Status of this on-site right now is that the steam  
18 generators have been removed and stored, new steam  
19 generators are in place. All the piping modifications are  
20 in tact, and they are in the process of weld RT examinations  
21 now. The liner plate has been reinstalled, and they were  
22 doing weld examinations on that over the weekend. The  
23 concrete poured to repour the containment or close the  
24 containment hole will be performed this week.

25 MR. CARROLL: How hot were the inside of the

1 channel heads?

2 MR. HOLIAN: Mr. Vandewalle will be covering that  
3 later on one of his slides. I forget the numbers. What  
4 they did was -- it was 2-R right away. I was down there a  
5 month ago and was from here to Mr. Masciantonio and it was  
6 less than 40 millirem an hour. It was in the region 25 to  
7 30 millirem an hour. They had substantial decontamination  
8 and it looks like they are on a record pace for man-REM  
9 reduction during steam generator project.

10 [Slide.]

11 The next issue of particular to the Palisades  
12 plant is the transfer of plant ownership. That is the  
13 formation of the Palisades generating company. A license  
14 amendment was submitted in February of 1989 -- correction --  
15 to form the Palisades generating company which is a new  
16 company made up of Consumers Power, Bechtel and Westinghouse  
17 which was just named as a third party this year.

18 In general right now, they are going through their  
19 Michigan public Service Commission hearings and they will be  
20 starting next week I believe with the Federal Energy  
21 Regulatory Commission, the FERC hearings. The staff is  
22 reviewing their application at this time.

23 Once again, Consumers Power will maintain the  
24 operation of the plant and will be the operator of the plant  
25 in the license. That is the most important part of the

1 generating company from our view. Our financial group is  
2 doing a review of that in the antitrust aspect of the  
3 Palisades generating company.

4 MR. CARROLL: Bechtel and Westinghouse have no say  
5 in the operation or Board of Directors --

6 MR. HOLIAN: There will be a board of directors,  
7 but it is mentioned in your SER there -- Palisades  
8 Generating Company of approximately 12 people, maybe seven  
9 on the board of directors I believe is what they are  
10 planning right now. That will be more of a review process  
11 of reviewing what Consumers is doing as the operator. They  
12 would need -- to change operators they would need to come  
13 back into the staff to request a change of the operator  
14 function.

15 [Slide.]

16 The last slide that I have is to show that the  
17 Palisades staff -- it's a simple organization chart. Also,  
18 a very experienced organization chart. Their President and  
19 Chief Operating Officer has a doctorate in Nuclear  
20 Engineering through Mr. Slade -- Mr. Hoffman, the Vice  
21 President of Nuclear Operations has been in the past the  
22 Palisades' general manager and Big Rock Point general  
23 manager.

24 Mr. Vandewalle is with us today as the director of  
25 Plant Safety and Licensing, and he has 17 years of nuclear

1 experience and approximately 12 of it at Consumers  
2 organization or Palisades. With that, if there are no other  
3 questions, I will introduce Mr. Vandewalle.

4 MR. SIESS: Are there any other questions. Bill?

5 MR. KERR: What is the current status of the  
6 Palisades IPE program?

7 MR. HOLIAN: The IPE program?

8 MR. KERR: Yes.

9 MR. HOLIAN: Upcoming, in one word for staff  
10 review process. I don't know what else I can give you other  
11 than that.

12 MR. SIESS: Are they doing a PRA and who is doing  
13 it?

14 MR. HOLIAN: Yes. I am not sure -- Dave, you can  
15 cover that when you up here?

16 MR. VANDEWALLE: Yes.

17 MR. HOLIAN: Okay.

18 MR. SIESS: Are there any other questions?

19 [No response.]

20 MR. VANDEWALLE: As Brian said, I am Dave  
21 Vandewalle, the Plant Safety and Licensing Director at  
22 Palisades plant. I wanted to just speak briefly with you,  
23 and if I am talking about something that you are not  
24 interested in Dr. Siess, please just raise your hand and I  
25 will stop.

1 [Slide.]

2 In intended to briefly cover the Palisades --  
3 Consumers Power Company Nuclear Organization, our plant  
4 mission, a little bit on the recent plant history and Brian  
5 touched on that pretty well. Some of the major  
6 modifications to the plant since the systematic modification  
7 program and status on the steam generator replacement  
8 project that is presently ongoing.

9 Regarding the organization, it is the same  
10 organization chart Brian Holian just showed you. I have  
11 shown on here the years of nuclear experience in the  
12 organization at Consumers Power Company from our President,  
13 who has 17 years of nuclear experience -- we stopped  
14 counting that when he left the position of Vice President of  
15 Nuclear Operations. He has been with Consumers since 1970.

16 The Vice President of Energy Supply Services, who  
17 is responsible for our major modification projects at the  
18 plant also has a considerable amount of nuclear experience.  
19 He was on the Palisades staff as the planning administrative  
20 manager before he was promoted to this new position of Vice  
21 President of Energy Supply Services. In that capacity he is  
22 also the outage manager for our steam generator replacement  
23 project at this time.

24 All of the rest of the organization I won't talk  
25 about it, unless you want to hear more about the



1 individuals. They have considerable amount of operating  
2 experience.

3 [Slide.]

4 Palisades mission. At Palisades our mission is to  
5 provide safe, reliable, cost-effective power so that we can  
6 be recognized as one of the top ten nuclear plants in the  
7 United States. That may sound like motherhood, but it's  
8 very important to us and very important to the staff at  
9 Palisades, all 500 people.

10 MR. KERR: How will you know when you have become  
11 one of those?

12 MR. VANDEWALLE: I will talk about that. We look  
13 at five performance key areas. In measuring our -- in  
14 measuring when we have reached the top ten performance, we  
15 look at the first three in particular in those first three  
16 performance areas. We are using the INPO performance  
17 indicators that relate to those three areas to measure our  
18 performance against the rest of the industry.

19 We believe that if we can obtain top quartile  
20 performance, meaning we are in the top quartile in each of  
21 those areas -- there are eight INPO performance indicators  
22 that relate to those areas -- we will become top ten. We  
23 don't believe that we need to be top ten in each of those  
24 eight areas. We believe we need to be top quartile in each  
25 of those eight areas, at which point we believe that we will

1 be recognized by the regulators as being one of the top ten  
2 plants in this country.

3 MR. CARROLL: Where are you now?

4 MR. VANDEWALLE: In 1989 we were top quartile in  
5 two out of the nine areas. We are -- our goal is to be top  
6 ten in 1992, so we have a ways to go. We feel that we are  
7 well on our way in getting there.

8 MR. CARROLL: You feel that you can justify the  
9 expenditure of money and resources to reach that objective?

10 MR. VANDEWALLE: A lot of resources have been  
11 spent to improve the operation of the Palisades and I will  
12 get to that in a moment. Yes.

13 MR. CARROLL: There are utilities out there that  
14 say I can't afford to keep up with what is a moving target.  
15 My plant is safe enough, I feel good about the plant, but I  
16 can't afford to become one of the top ten percent plants in  
17 the country. You can't get the money from -- whatever.

18 MR. SIESS: Besides, somebody has got to be on the  
19 bottom.

20 MR. CARROLL: You are taking a different attack  
21 than the one that I described.

22 MR. VANDEWALLE: I believe there is a lot of  
23 capability in the people that we have, and we can obtain top  
24 ten within the budget limitations that we have. We believe  
25 that we can do that.

MR. CARROLL: Good luck.

2 MR. VANDEWALLE: Operating history of the plant, I  
3 won't go into the early history. People have discussed  
4 that. Brian mentioned --

5 MR. CARROLL: One thing that wasn't discussed in  
6 your early history was all the core internal vibration  
7 problems. That all got solved.

8 MR. VANDEWALLE: We did make some modifications to  
9 the core to solve that problem, and we did monitor and  
10 continue to monitor the situation there using our nuclear  
11 instrumentation. We haven't seen a recurrence of that  
12 problem. MR. CARROLL: Since the early 1970's.

13 MR. VANDEWALLE: Brian used the word average, I  
14 have used the word undistinguished in the period up until  
15 1985.

16 MR. CARROLL: Shall we ask Dr. Lewis what word he  
17 likes the best.

18 [Laughter.]

19 MR. VANDEWALLE: In 1986 Brian alluded to what we  
20 had -- we had a reactor trip on May 19th. That was followed  
21 quickly by a confirmatory action letter. At that time  
22 regulatory scrutiny -- prior to that time and as a result of  
23 that trip, regulatory scrutiny at Palisades was changing  
24 dramatically because of NRC concern with effectiveness of  
25 the maintenance at Palisades and the plant condition,

1 material condition of the plant.

2           The reactor trip occurred and a number of other  
3 pieces of equipment failed to function properly in that  
4 event. That led to the confirmatory action letter which  
5 required that the plant be shut down until certain things  
6 were accomplished. I have listed three major areas of  
7 emphasis during that shutdown that followed that lasted for  
8 about a year. We undertook a material condition task force  
9 which -- that's what we called it. It was an effort to  
10 identify and correct all known and potential operability and  
11 maintenance problems for systems that were important to  
12 plant safety and reliability.

13           Consider effort went into identifying all of those  
14 issues. We then went about correcting those issues before  
15 we took the plant back to service. Some of the issues  
16 remained open after we returned the plant to operation.  
17 They were issues such as replacement of aging equipment  
18 which we planned to do and since have done, but we did not  
19 do that at that time. We incorporated those other issues  
20 into our five year plan, and we have been working those  
21 other issues off in the intervening years.

22           We also undertook what we called a system  
23 functional evaluation. That was an evaluation to assure  
24 that the testing we were performing at the plant adequately  
25 demonstrated the ability of important plant systems to

1 operate -- to meet operating and functional requirements.  
2 This review resulted in a number of new performance tests --  
3 over 100 -- including full flow testing of safety related  
4 pumps that we have not been previously performing. They  
5 weren't required by our tech specs and we have not been  
6 testing the plant in that way in the past.

7 The majority of these new tests were performed  
8 prior to start up from that lengthy outage, and are  
9 subsequently being performed on a periodic basis. In a  
10 number of cases there we had to make plant modifications in  
11 order to permit us to measure those tasks and we have added  
12 additional instrumentation. We also had to add alternate  
13 flow paths in order to perform that full flow testing of the  
14 plant safety systems.

15 Third, because we did not have a good  
16 understanding of our plant design basis -- our understanding  
17 of our plant design basis was incomplete to say the least,  
18 we commenced what we called our configuration control  
19 project. This project was initiated in 1987 after that  
20 outage was over. It has as its primary objective, the  
21 recovery of the plant design documentation and plant design  
22 basis for important plant safety systems.

23 [Slide.]

24 The plant returned to service in 198 --

25 MR. CARROLL: Going back to something that you

1 said in describing one of the earlier issues here, you  
2 mentioned a five year plan.

3 MR. VANDEWALLE: Yes, sir.

4 MR. CARROLL: This is your planning of major  
5 expenditures when you are going to satisfy commitments you  
6 have made for licensing issues and that sort of thing?

7 MR. VANDEWALLE: Exactly. It also includes other  
8 improvements that we feel are necessary to maintain a highly  
9 reliable plant beyond regulatory commitments, licensing the  
10 plants.

11 MR. CARROLL: You are not at present involving the  
12 NRC in that planning process?

13 MR. VANDEWALLE: If you are asking do we have a  
14 living schedule that has been approved by the NRC, no, we do  
15 not.

16 MR. CARROLL: Do you see advantages to getting  
17 into that kind of arrangement?

18 MR. VANDEWALLE: I haven't really thought about  
19 it. I think we considered that at one point when the NRC  
20 issued a generic letter, and I think we chose not to at that  
21 time. We do have a living schedule which is the license  
22 condition for our Big Rock Point Plant. We have experience  
23 with it through our Big Rock Point Plant, and we elected not  
24 to at Palisades.

25 MR. CARROLL: How is it working at Big Rock?

1 MR. VANDEWALLE: I believe it's working very well  
2 for Big Rock.

3 MR. CARROLL: You don't think it would be useful  
4 or work well for Palisades?

5 MR. VANDEWALLE: We feel we have the NRC  
6 requirements as well as the other things we want to do to  
7 improve plant reliability under good control. I don't know  
8 that it would add a lot to our planning and scheduling of  
9 that work.

10 As Brian alluded to, we have seen improving  
11 operational performance in the years since that extended  
12 outage. We did make a decision to replace the steam  
13 generators in late 1989. That is probably the one area or  
14 is the one area where the plant continues to be a lower  
15 performer because of the condition of its steam generators.  
16 The steam generator replacement is ongoing.

17 Before I go on to that, I would just like to go  
18 back to Dr. Kerr's question. He asked how we will measure  
19 performance. I talked about the INPO performance  
20 indicators. Also, how do we measure the results of this  
21 extended outage and all the work that we did to improve the  
22 material condition of the plant is a good question as well.  
23 We have measured that in a lot of ways. Brian talked about  
24 the increased length of our operating runs. Except for the  
25 steam generators, plant equipment since those outages, has

1 performed very well.

2 The capacity factor is still low. It is low in  
3 part because of the four steam generator outages. It is  
4 also low because we planned several maintenance outages  
5 outside of our normal refueling outages to continue our  
6 material condition improvements at the plant. We hadn't  
7 accomplished all that we wanted to back in 1986 and 1987.  
8 We wanted to accomplish more in the area of material  
9 improvement, so we scheduled some outages between refueling  
10 outages to do that. So, our material condition is low.

11 Aside from the fact that our capacity factor is  
12 low, we are continuing to see improvement in the operation  
13 of the plant. That's an indicator to us of how we have been  
14 successful. We also see an improving trend in the number of  
15 automatic scrams. Again, Brian mentioned our efforts with  
16 our turbine generators to improve our reliability of our  
17 turbine generator system. We believe those efforts have been  
18 very good in terms of reducing the number of automatic  
19 scrams that the reactor has experienced.

20 We also looked at preventive maintenance  
21 activities as a percentage of total maintenance activities.  
22 Before the 1986 outage, Palisades -- preventive maintenance  
23 activity at Palisades comprised about ten percent of the  
24 total maintenance activities. Today, preventive maintenance  
25 comprises 50 to 60 percent of total maintenance activities.



1 In some maintenance disciplines, INC, it may be even higher  
2 than that. So, we are devoting a lot more of our effort to  
3 preventive maintenance today as opposed to corrective  
4 maintenance.

5 MR. CARROLL: Are you involved with any of the  
6 reliability center maintenance?

7 MR. VANDEWALLE: We are beginning in that area.  
8 We have two pilot systems, one of them being the diesel  
9 generators, where we are performing a reliability center  
10 maintenance study to determine how we can best streamline  
11 our maintenance activities for the diesel generators.

12 We also looked at the huge reduction and our  
13 corrective maintenance backlog that occurred. We don't  
14 really like to talk about numbers, because numbers are  
15 difficult to equate between plants. There has been a  
16 dramatic reduction in the maintenance backlog. Also, we  
17 look at maintenance rework rate at Palisades. Today, our  
18 maintenance rework rate is a very small percentage of our  
19 total maintenance. What we mean by rework rate are the  
20 number of maintenance activities that we have to go back and  
21 do a second time because we didn't do it correctly the first  
22 time. We are much improved in that area.

23 Last, both INPO and NRC have commented and we have  
24 recognized it ourselves, that we have been able to develop  
25 an extreme high level of teamwork at Palisades among the

1 maintenance, operations and engineering people involved in  
2 the problems that we are facing day-to-day at Palisades.  
3 That teamwork is paying big benefits at Palisades.

4 The next thing that I had on the agenda -- and I  
5 won't go into it in any amount of detail unless you have  
6 some questions -- I have listed six significant or major  
7 modifications to the plant since the time of SEP. Very  
8 briefly, we installed the third auxiliary feedwater pump in  
9 response to TMI action plan, and also to address some of the  
10 single failure vulnerabilities in the original system. We  
11 greatly upgraded our off-site power ties.

12 MR. CARROLL: Meaning that you have more ties than  
13 you had before?

14 MR. VANDEWALLE: We now have two immediate access  
15 circuits between our plant safety buses and our switchyard  
16 and one delayed access circuit, when originally we had one  
17 immediate access circuit and one delayed access circuit that  
18 required considerable time to access.

MR. CARROLL: You are talking about switchyard.

20 MR. VANDEWALLE: Switchyard into the plant.

21 MR. CARROLL: I would have read off-site power to  
22 mean number of transmission lines and where they go, and  
23 that sort of thing.

24 MR. VANDEWALLE: We haven't changed that. We  
25 still have essentially three transmission lines. We are

1 implementing the off-site power or ATWS modifications this  
2 outage. As I mentioned earlier, we installed a lot of  
3 instrumentation for system performance testing. We have  
4 also made a number of improvements and are continuing to  
5 make improvements in the secondary system. If I could just  
6 mention those briefly.

7 [Slide.]

8 We installed a reverse osmosis unit to provide  
9 adequate supplies of high quality water at Palisades for our  
10 secondary system. We have done a great amount of  
11 maintenance on our secondary system valves. The result of  
12 that has been an extremely tight secondary system, such that  
13 we consistently through the last cycle operated with less  
14 than 2 SCFM leakage to the condenser.

15 During the current outage we are replacing the  
16 main condenser and the feedwater heaters with new units that  
17 do not contain copper bearing materials. We believe that  
18 all of these efforts should greatly enhance the operation of  
19 our steam generators in the future.

20 MR. CARROLL: You do or don't have polishers?

21 MR. VANDEWALLE: We don't use polishers. We did  
22 install a polishing unit and elected not to use it because  
23 of problems that we had with it.

24 MR. CARROLL: With your brand new steam generators  
25 you are going to rely on the change of materials --

1 MR. VANDEWALLE: Yes, and strict control over  
2 chemistry and oxygen.

3 [Slide.]

4 The last thing that I wanted to talk about briefly  
5 was our steam generator replacement project. I handed a few  
6 brochures out up there that show an artist rendition of some  
7 of the activities. Brian talked about those activities. I  
8 just want to talk a little bit about schedule. When we  
9 established our schedule for this, as Brian described, it  
10 was 150 days to replace the steam generators. If we were to  
11 accomplish that, that would be a record for a steam  
12 generator replacement in this country.

13 A lot of planning went into it, a lot of teamwork  
14 between Consumers Power Company and the prime contractor,  
15 Bechtel on the job. If you look at the schedule, the first  
16 major activity was defueling the reactor. We accomplished  
17 that three days ahead of schedule. Bechtel then completed  
18 the cut in the containment, opened up a 26 by 28 foot  
19 opening in the wall of containment. We then installed a  
20 semi --

21 MR. SIESS: You cut that out in one piece it says  
22 in here?

23 MR. VANDEWALLE: It came out in several pieces,  
24 actually. The brochure may be --

25 MR. HOLIAN: One large piece though. They took

1 out some smaller pieces at the bottom for the rails to go  
2 in, but otherwise --

3 MR. SIESS: How did they handle that big chunk of  
4 concrete?

5 MR. HOLIAN: The same rigging that handled the  
6 generators coming out.

7 MR. SIESS: You mean they moved it out?

8 MR. HOLIAN: Sure did. Kind of moved it out and  
9 slid it on its side.

10 MR. SIESS: Why did you have to go in above the  
11 old opening?

12 MR. HOLIAN: That's the grade level that I showed  
13 you on that one piece of paper that I gave you. That's the  
14 old opening -- it was under dirt. They would excavate down  
15 a little bit, that line going across.

16 MR. SIESS: I see that. It didn't have to do  
17 with the internal arrangement of the plant, because you took  
18 them in through the lower opening.

19 MR. HOLIAN: I don't know if they scoped it out to  
20 going back down and digging through. Either way when the  
21 opening that they did cut -- the old containment design --  
22 there was very little they had to move. They had to move  
23 one MCC unit for some power sources inside. The safety  
24 injection tanks in this containment are up near the roof, if  
25 you want to call it that, so there was very little that they

1 had to move.

2 MR. VANDEWALLE: Next, a semi-gantry crane was  
3 installed in containment to allow the lift of the steam  
4 generators. They are about 1 million pounds each and our  
5 older crane was not capable of handling --

6 MR. SIESS: What's a semi-gantry, one leg?

7 MR. VANDEWALLE: The center gantry, yes.

8 MR. SIESS: You said semi-gantry.

9 MR. VANDEWALLE: How does it get that name, I  
10 don't know.

11 MR. SIESS: Is it half a gantry, one leg?

12 MR. HOLIAN: Basically it comes down on one leg  
13 right in center and supports itself on the polar crane up  
14 above.

15 MR. SIESS: Okay. I have a picture here.

16 MR. KERR: There are some people here who are  
17 interested in concrete.

18 MR. VANDEWALLE: After the primary piping cuts  
19 were made, the old steam generators were lifted out and the  
20 new steam generators were moved back in. That entire  
21 evolution was completed 12 days early from our schedule.

22 MR. CARROLL: What is good about the new steam  
23 generators from a design point of view?

24 MR. VANDEWALLE: The new steam generators don't  
25 have the drill support plates like the old ones do. They

1 use a bat-wind type support structure and a-crate type  
2 support structure. They have a different blowdown  
3 arrangement. We are planning to upgrade the blowdown  
4 capacity of the plant to allow us to increase blowdown from  
5 the generators.

6 MR. CARROLL: Conceptually they are fairly close  
7 to the System 80-plus generators?

8 MR. VANDEWALLE: I don't know the answer to that.  
9 The generators were contracted with Combustion Engineering  
10 in 1979 and built in the early 1980's.

11 MR. HOLIAN: Evolution before that.

12 MR. VANDEWALLE: We are presently reinstalling  
13 piping to the new generators. That is very close to being  
14 finished. Brian talked about the narrow gap welding. The  
15 containment opening is being closed, the liner plate has  
16 been welded back, and we are ready for the concrete for the  
17 opening or for the closing.

18 We expect to start refueling about ten days ahead  
19 of schedule. It is shown here on the 26th. We will start  
20 refueling between the 13th and the 16th. If all goes then  
21 as planned, we will be on line sometime before the middle of  
22 February.

23 [Slide.]

24 The only other thing that I wanted to mention is  
25 that we have had some very good performance regarding

1 personnel exposure for this job. About a year ago when we  
2 began the planning for this job we estimated the dose at 640  
3 man-REM for the steam generator replacement based on other  
4 jobs that have been done and our understanding of how our  
5 job differs from those other jobs.

6 Before this outage began we established a target  
7 of 500 man-REM, and we established that target because we  
8 had completed detailed planning and we felt that we could  
9 reach that. We felt that we had a chance to reach that  
10 target. Also, that would be a record for a steam generator  
11 replacement in this country.

12 You see the progress to date. One comment that  
13 should be made on that is, we are about two weeks ahead of  
14 schedule. We fully expect to come in under 400 man-REM for  
15 the replacement outage, which will be a very good  
16 performance we believe.

17 That's all I had prepared to say.

18 MR. SIESS: I have one question about that  
19 containment opening. Some people have spent an awful lot of  
20 time worrying about inspecting prestressing tendons. Here  
21 you had quite a few that you had to take out and lay down on  
22 the ground somewhere. Did anybody look at them to see what  
23 shape they were in --

24 MR. VANDEWALLE: We inspected --

25 MR. SIESS: When they cut through the ductwork



1 around the hole, did they take a chance to look at the ducts  
2 and stuff?

3 MR. VANDEWALLE: We have inspected the tendons,  
4 yes, that we removed.

5 MR. SIESS: Do you have a report on that anywhere,  
6 documentation? I asked one of the staff this morning, a  
7 structural engineering, and he hadn't even thought about it.  
8 I just wondered if you got a report on the condition, did  
9 you find anything interesting or unusual?

10 MR. VANDEWALLE: There have been several that were  
11 --there has been some corrosion observed on a couple of  
12 strands and there has been some discoloration observed, and  
13 that is being evaluated. I haven't seen these.

14 MR. SIESS: You reused them. They were good  
15 enough to put back in.

16 MR. VANDEWALLE: Right.

17 MR. SIESS: You are going to do another structural  
18 integrity test; right?

19 MR. VANDEWALLE: That's correct.

20 MR. SIESS: Crack the concrete?

21 MR. VANDEWALLE: We are going to map cracks in the  
22 concrete when we do the test to see if it does crack.

23 MR. SIESS: As I recall --

24 MR. CARROLL: To see if it does.

25 MR. SIESS: -- with the relaxation you are likely

1 to get cracking on another SIT. What is the pressure for  
2 the SIT, do you know?

3 MR. VANDEWALLE: Sixty-two pounds.

4 MR. SIESS: Sixty-two?

5 MR. VANDEWALLE: Yes. Design pressure is 55.

6 MR. SIESS: Your leak rate test is made at what?

7 MR. VANDEWALLE: Fifty-five.

8 MR. SIESS: Fifty-five. They calculate it's going  
9 to crack it?

10 MR. VANDEWALLE: I don't know the answer to that,  
11 Dr. Siess.

12 MR. SIESS: It seems a shame to put cracks in the  
13 darn thing when you don't need them, just because somebody -  
14 -

15 MR. ZWOLINSKI: Can we check on that.

16 MR. VANDEWALLE: Can we check on whether we  
17 calculate cracks?

18 MR. HOLIAN: I was under the impression that we  
19 didn't. Headquarters staff has looked at a presentation by  
20 Bechtel, and they plan on observing the cracks, especially  
21 at the four corners to the cutting. When we went out there  
22 and inspected --

23 MR. SIESS: I wouldn't worry about those. I would  
24 worry about -- you got a liner and all that. I just don't  
25 see much point in cracking the concrete. We have already

1 made one test to check the calculations. We are still  
2 making SIT's on every plant I guess. If we built one the  
3 next century we would still be doing it.

4 Are there any questions of Mr. Vandewalle. Bill.

5 MR. KERR: Can you tell me something about the  
6 current status of the IPE program?

7 MR. VANDEWALLE: Yes, I forgot about that. We are  
8 preparing our probabilistic risk assessment. I don't know  
9 how you describe it in terms of levels of risk assessment.  
10 We are doing a plant risk assessment, and we are addressing  
11 consequences. We are developing consequence models as well.

12 We are doing that with Consumers Power Resources,  
13 augmented by expertise from consultants where we need that  
14 expertise.

15 MR. KERR: Do you have --

16 MR. VANDEWALLE We have not completed that yet,  
17 and I don't recall our schedule for when that is to be  
18 submitted to the NRC.

19 MR. KERR: Are you using individual consultants or  
20 some firm?

21 MR. VANDEWALLE: We have been primarily working  
22 with Tenara, who bought out Delian I believe.

23 MR. KERR: Thank you.

24 MR. HOLIAN: I believe the schedule is 1992  
25 timeframe for that.

1           MR. SIESS: Thank you very much. Gentlemen,  
2 unless there are more questions that you have for the staff,  
3 I would like to turn off the transcript and turn to a  
4 discussion on how to present this to the Committee.

5           [Whereupon, at 3:25 p.m. the Subcommittee  
6 concluded.]

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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: Subcommittee On FTOL  
Conversions

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.

Mary C. Larkin

Official Reporter  
Ann Riley & Associates, Ltd.

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# NRR STAFF PRESENTATION TO THE ACRS

**SUBJECT:** DRESDEN 2 - POL TO FTOL CONVERSION

**DATE:** DECEMBER 5, 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:**

### 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 2.1103 POL NOT EXPIRED IF LICENSEE FILED APPLICATION AT LEAST 30 DAYS PRIOR TO EXPIRATION DATE
  - \* CECSO 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 (TPSAR-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.

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)



# 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

- o BACKGROUND
- o HIGHLIGHTS OF OPERATING HISTORY
- o SYSTEMATIC EVALUATION PROGRAM
- o UNRESOLVED SAFETY ISSUES

## PALISADES POL/FTOL CONVERSION

### BACKGROUND

- o CP ISSUED MARCH 14, 1967
- o POL ISSUED MARCH 24, 1971 TO EXPIRE MARCH 1, 1974  
(ALLOW AN INTERIM PERIOD OF ROUTINE OPERATION)
- o FTOL CONVERSION APPLICATION JANUARY 22, 1974  
(ALSO REQUESTED POWER INCREASE IN CONFORMANCE WITH 10CFR2.109)
- o STAFF REVIEW OF LICENSE CONVERSION STOPPED IN 1975
  - LARGE NUMBER OF UNRESOLVED GENERIC ISSUES
  - ESTABLISH APPROPRIATE SCOPE OF REVIEW
- o SUBSUMED INTO SYSTEMATIC EVALUATION PROGRAM IN 1977
  - STAFF RECOMMENDATION
  - SIMILAR SCOPE OF SEP AND POL CONVERSION
- o SEP RESULTS DOCUMENTED IN INTEGRATED PLANT SAFETY ASSESSMENT REPORT (NUREG-0820) AND SUPPLEMENT (NUREG-0820 SUPPLEMENT 1)

## PALISADES POL/FTOL CONVERSION

### ENVIRONMENTAL CONSIDERATIONS

- o FINAL ENVIRONMENTAL STATEMENT ISSUED JUNE 1972
- o FINAL ADDENDUM TO FES ISSUED FEBRUARY 1978 TO SUPPORT FULL TERM OPERATING LICENSE AT INCREASED POWER LEVEL
- o FINAL ADDENDUM CONCLUDED THAT FULL TERM OPERATING LICENSE COULD BE ISSUED
- o STAFF HAS REEXAMINED IMPACTS AND ISSUED ENVIRONMENTAL ASSESSMENT IN SUPPORT OF PALISADES FTOL
- o NO NEW IMPACTS OR SIGNIFICANT CHANGES FROM THOSE IDENTIFIED PREVIOUSLY - FES SUPPLEMENT NOT REQUIRED

## PALISADES POL/FTOL CONVERSION

### PLANT DESCRIPTION

- o PRW OF CE/BECHTEL DESIGN
- o 2530 MWt - 2 LOOPS - 2 STEAM GENERATORS
- o PRESTRESSED CONCRETE CONTAINMENT DESIGNED TO 55 PSIG AND 283 DEG F INTERNAL PRESSURE/TEMPERATURE
- o MECHANICAL DRAFT COOLING TOWERS
- o LOCATED ON EASTERN SHORE OF LAKE MICHIGAN NEAR SOUTH HAVEN, MI

## 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/FTOI. 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

## PALISADES POL/FTOL CONVERSION

### CONCLUSIONS

STAFF REVIEW HAS DETERMINED THAT:

- o APPLICATION FOR FTOL FOR PALISADES WAS FILED BY CONSUMERS POWER COMPANY
- o PROVISIONS OF POL HAVE BEEN MET
- o FACILITY WILL OPERATE IN CONFORMANCE WITH FTOL APPLICATION
- o PUBLIC HEALTH AND SAFETY WILL NOT BE ENDANGERED
- o LICENSEE IS TECHNICALLY QUALIFIED
- o PALISADES HAS BEEN OPERATING SINCE 1971
- o FTOL FOR PALISADES SHOULD BE ISSUED

# NRR STAFF PRESENTATION TO THE ACRS

3

**SUBJECT:** PALISADES NUCLEAR PLANT - PRESSURIZED THERMAL SHOCK

**DATE:** DECEMBER 5, 1990

**PRESENTER:** BARRY J. ELLIOT

**PRESENTER'S TITLE/BRANCH/DIV:** SR. MATERIALS ENGINEER  
MATERIALS AND CHEMICAL ENGINEERING BRANCH  
DIVISION OF ENGINEERING TECHNOLOGY, NRR

**PRESENTER'S NRC TEL. NO.:** 492-0709

**SUBCOMMITTEE:** MATERIALS AND METALLURGY SUB-COMMITTEE

PROPOSED PRESSURIZED THERMAL SHOCK RULE

10 CFR 50.61

° SCREENING CRITERIA

- $RT_{PTS}$  OF 270°F FOR PLATES AND AXIAL WELDS
- $RT_{PTS}$  OF 300°F FOR CIRCUMFERENTIAL WELDS

°  $RT_{PTS}$  FORMULA

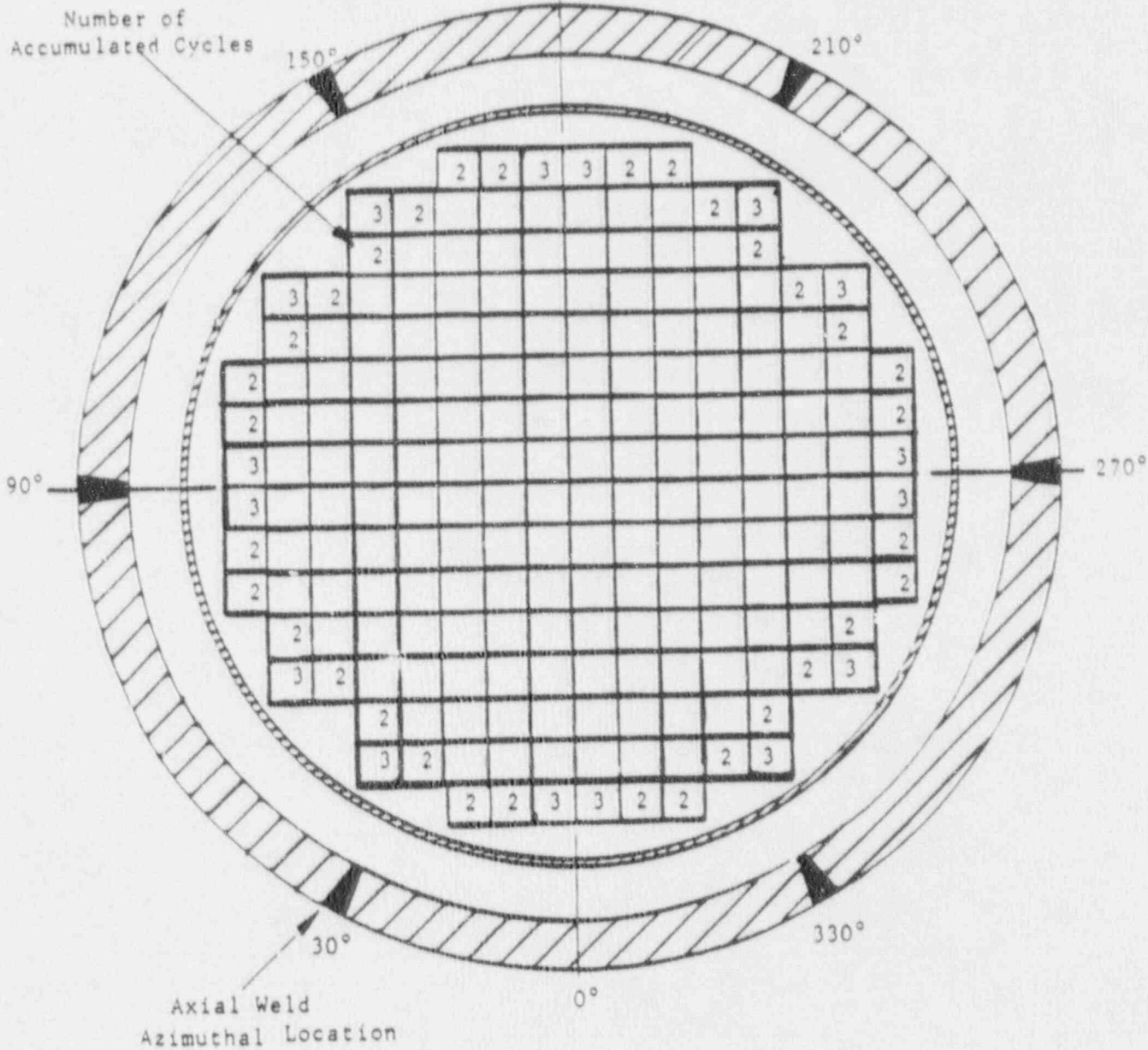
- $RT_{PTS} = I + M + (CF)(F)$
- MARGIN (M), CHEMISTRY FACTOR (CF) AND FLUENCE FACTOR (F) IN PROPOSED PTS RULE REVISED TO VALUES RECOMMENDED IN RG 1.99, REV. 2.
- UNIRRADIATED REF. TEMP. (I) UNAFFECTED BY PROPOSED PTS RULE

° OPERATING TEMPERATURE AND SURVEILLANCE TEST RESULTS COULD AFFECT  $RT_{PTS}$  VALUE

° NRC MAY APPROVE OPERATION AT VALUES OF  $RT_{PTS}$  ABOVE SCREENING CRITERIA

FIGURE 3.3

CYCLE 9 PERIPHERAL LOADING PATTERN



ASSEMBLIES REPRESENTED BY 3 ARE THRICE BURNED FUEL WITH HAFNIUM ABSORBERS

TABLE 2.2

## FAST NEUTRON FLUX REDUCTION ACHIEVED WITH CYCLES 8 AND 9 CORE LOADING PATTERNS

Material	Neutron Flux ( $10^{10}\text{n/cm}^2\text{-sec}$ , $E > 1.0$ MeV)			Flux Reduction*	Flux Reduction*
	Cycle 7	Cycle 8	Cycle 9	Cycle 8 (%)	Cycle 9 (%)
Axial Weld					
0°	4.74	2.08	2.10	-56.1	-55.7
30°	4.67	2.31	2.02	-50.5	-56.7
Circumferential Weld	6.10	4.87	3.14	-20.2	-48.5
Base Metal	6.10	4.87	3.14	-20.2	-48.5

\* Flux reduction is based upon the reference case of Cycle 7 which was typical of the previous cycles, ie. fresh fuel assemblies at the core periphery.

PALISADES REACTOR VESSEL BELTLINE

FROM REGULATORY GUIDE 1.99, REVISION 2

MATERIAL	SCREENING CRITERIA (°F)	Cu (%)	Ni (%)	CHEMISTRY FACTOR (CF)	FLUENCE TO REACH SCREENING CRITERIA (N/CM <sup>2</sup> )	DATE WILL REACH SCREENING CRITERIA
AXIAL WELDS, 30°	270	.19	1.10	229	1.634E19	9/2001
0°	270	.19	1.10	229	1.634E19	2/2002
CIRCUMFERENTIAL WELD	300	.20	.97	218.7	3.495E19	6/2017
LOWER SHELL PLATE	270	.25	.54	167.6	6.046E19	2040



PALISADES REACTOR VESSEL BELTLINE AND SURVEILLANCE WELDS

<u>WELD METAL</u>	<u>WIRE TYPE/HEAT</u>	<u>FLUX TYPE</u>	<u>Cu</u>	<u>Ni</u>	<u>CHEMISTRY FACTOR</u>	<u>INIT. RT NDT</u>	<u>MARGIN</u>
AXIAL WELDS	RAC03 HEATS W5214 AND 34B009 + Ni 200	LINDE 1092	.19	1.10	229	-56	66
CIRCUMFERENTIAL WELD	MILB4 MOD. HEAT 27204	LINDE 1092	.20	.97	218.7	-56	66
SURVEILLANCE WELD	RAC03 HEAT 3277 + Ni 200	LINDE 1092	.26	1.28	276	-56	66

PALISADES SURVEILLANCE TEST RESULTS

CAPSULE	FLUENCE (N/CM <sup>2</sup> )	MATERIAL	INCREASE IN REF. TEMP. MEASURED (°F)	INCREASE IN REF. TEMP. PREDICTED MEAN VALUE BY RG 1.99, REV.2 (F°)
W-290	1.105E19	PLATE (T)	155	171
		PLATE (L)	175	171
		WELD METAL	290	283
A-240	4.4E19	PLATE (T)	205	229
		PLATE (L)	205	229
		WELD METAL	350	380

## CONCLUSIONS

- ° PALISADES SURVEILLANCE DATA INDICATES THAT RADIATION EMBRITTLEMENT PREDICTED BY RG 1.99, REV. 2 AND PROPOSED PTS RULE ACCURATELY PREDICTS RADIATION EMBRITTLEMENT TO PALISADES BELTLINE MATERIALS.
- ° WITH CURRENT FLUX REDUCTION, PALISADES WILL REACH PTS SCREENING CRITERIA IN 2001
- ° TO OPERATE UNTIL 2007 LICENSEE IS EVALUATING
  - GREATER FLUX REDUCTION
  - RG 1.154 PROB. FRACT. MECH. ANALYSIS
  - VESSEL SHIELDING - WELDING OF NEUTRON PADS ONTO CORE SUPPORT BARREL

(3-A)

Diablo Canyon Unit 1 Surveillance

MILB MOD HEAT 27204 WELD METAL

Capsule

Neutron  
Fluence

Increase in Ref. Temp.  
Measure (°F)

Increase in Ref. Temp.  
Predicted Mean Value  
By RG1.99, REV. 2 (°F)

S

2.98E18

110

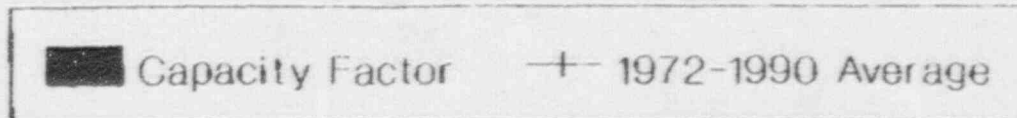
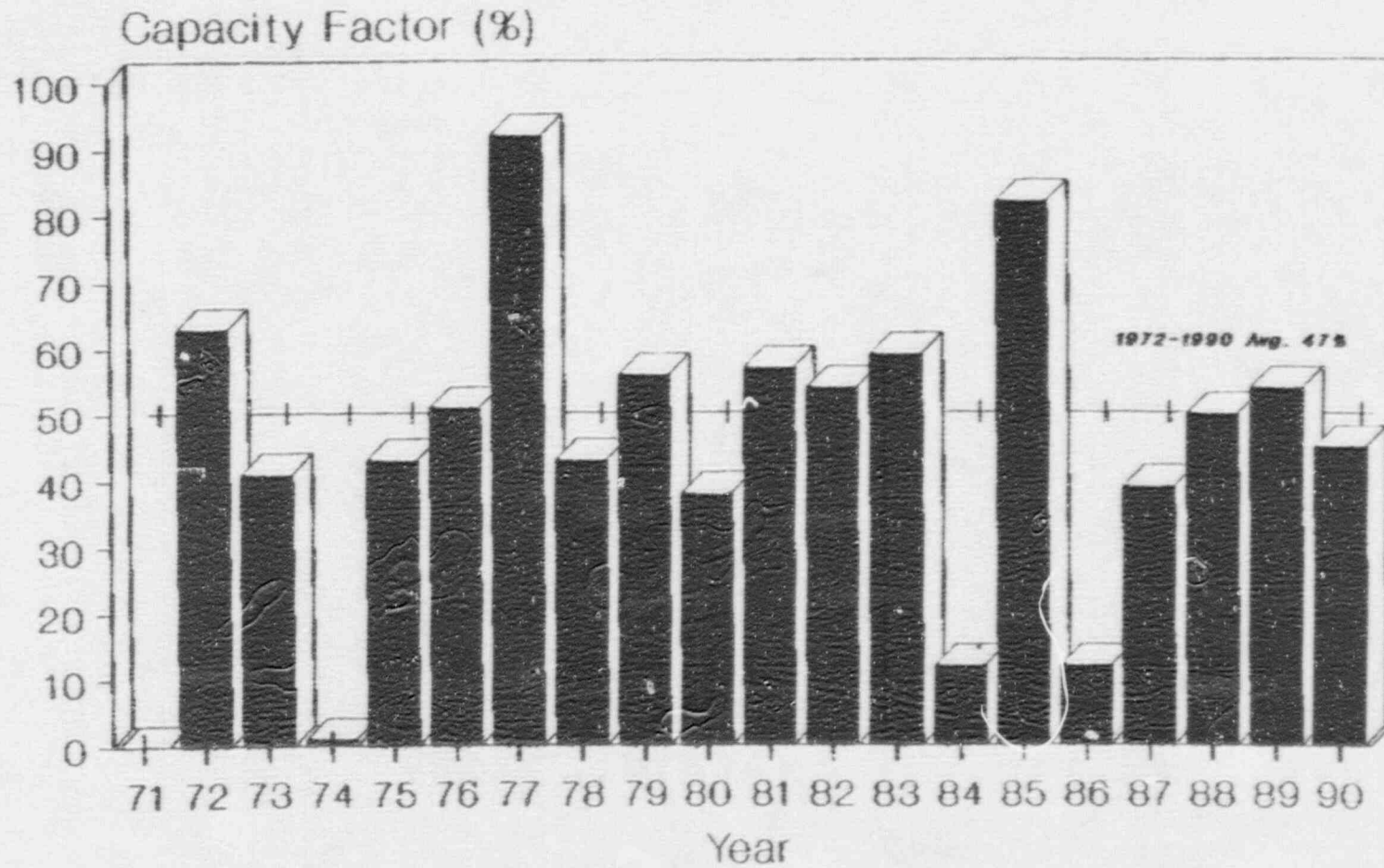
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PALISADES POL/FTOL CONVERSION

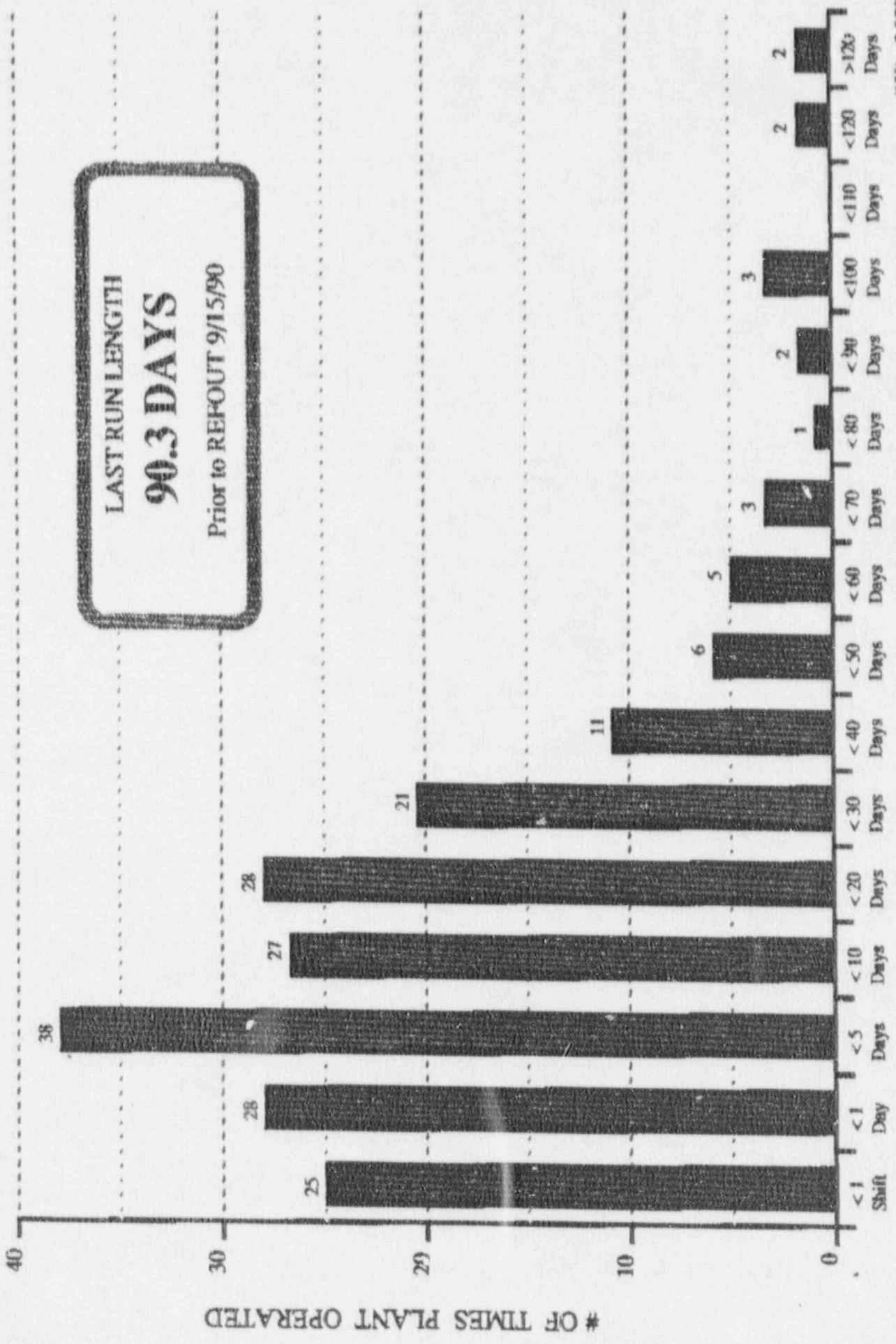
PLANT SPECIFIC ACTIVITIES

- 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 CAPACITY FACTOR



# PALISADES PLANT PRODUCTION RUN HISTORY



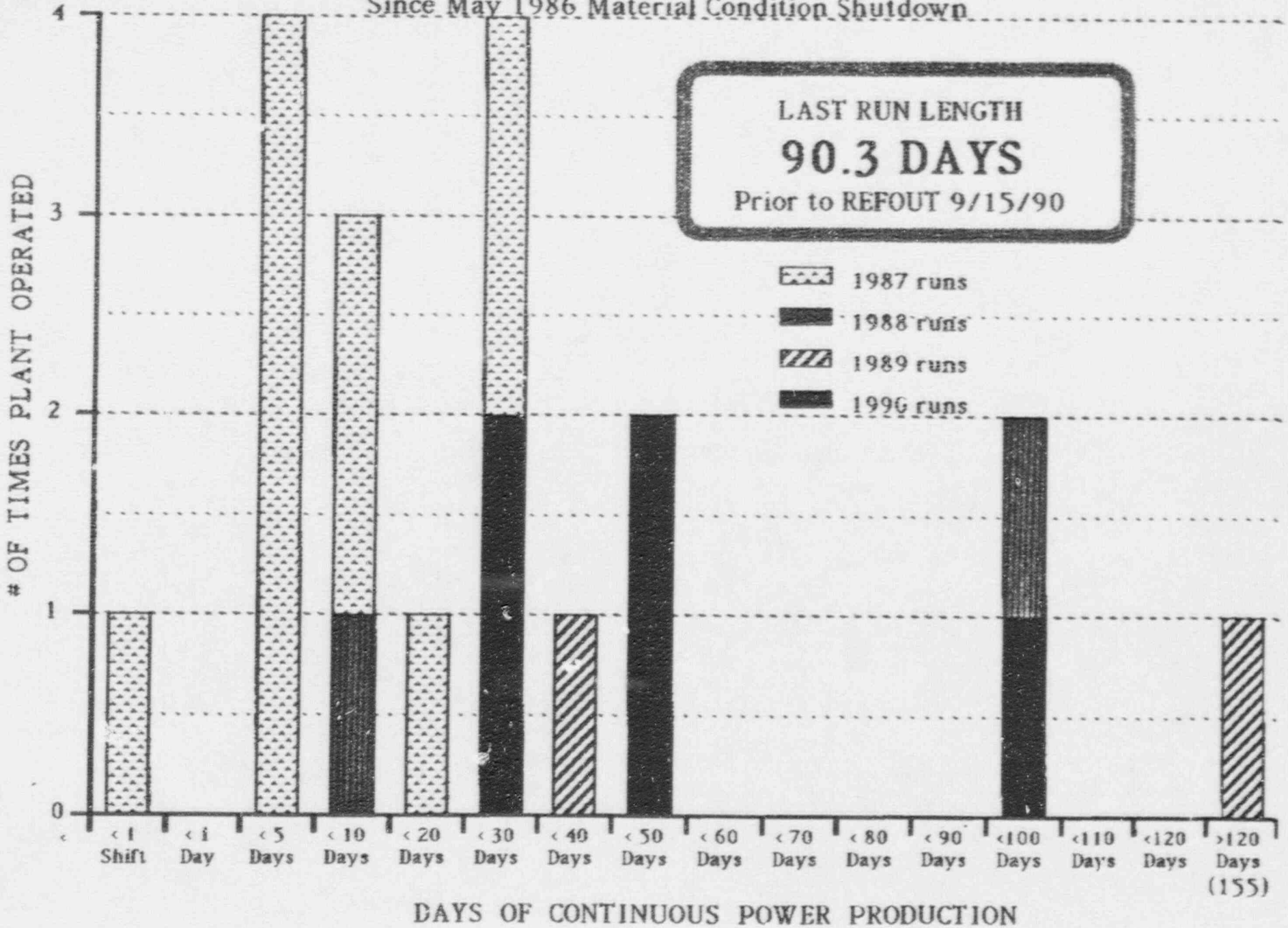
LAST RUN LENGTH  
**90.3 DAYS**  
 Prior to REFOUT 9/15/90

DAYS OF CONTINUOUS POWER PRODUCTION

(155) 3-8/89  
 (176) 1-7/81

# PALISADES PLANT PRODUCTION RUN HISTORY

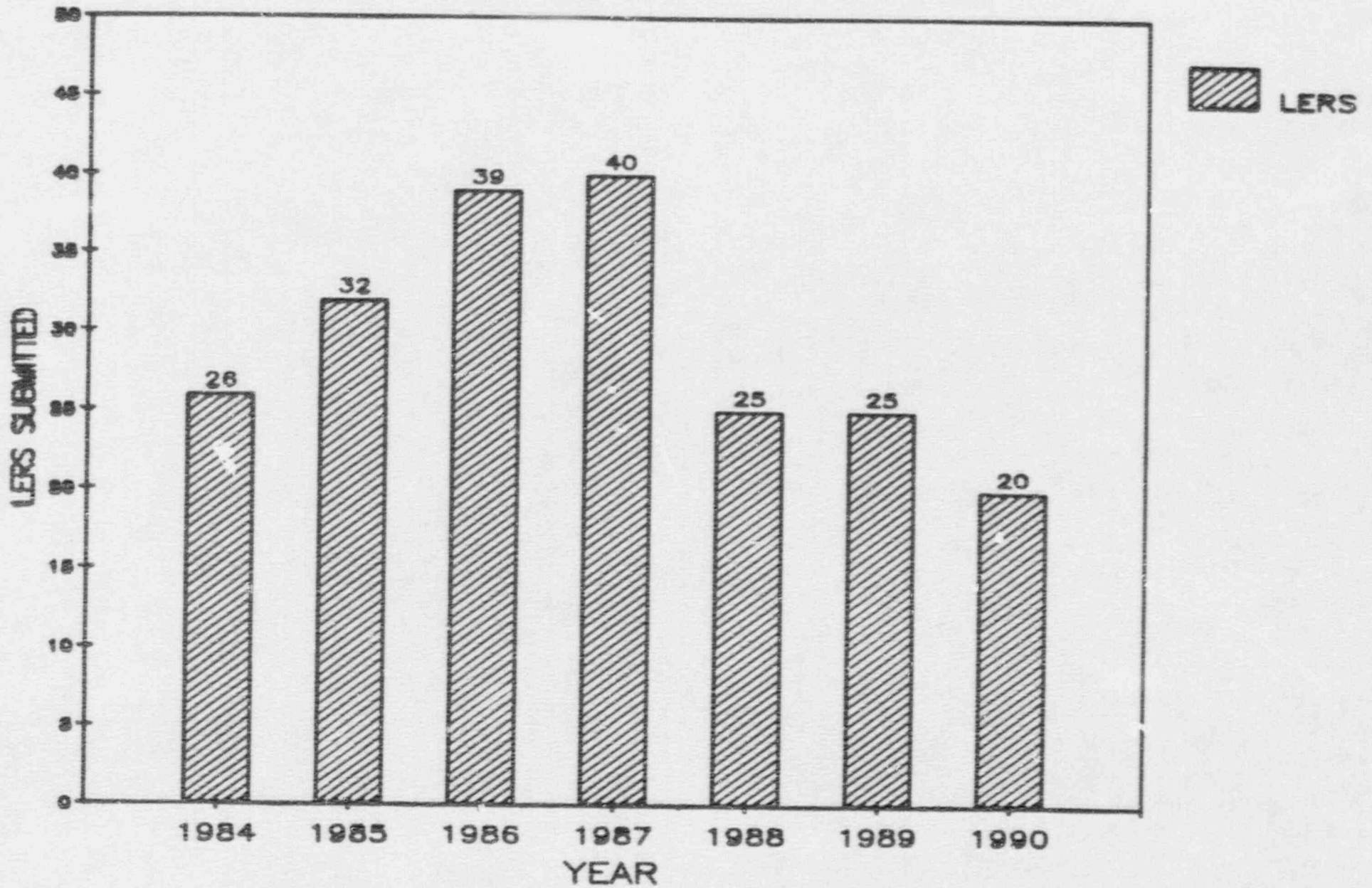
Since May 1986 Material Condition Shutdown





# PALISADES PLANT

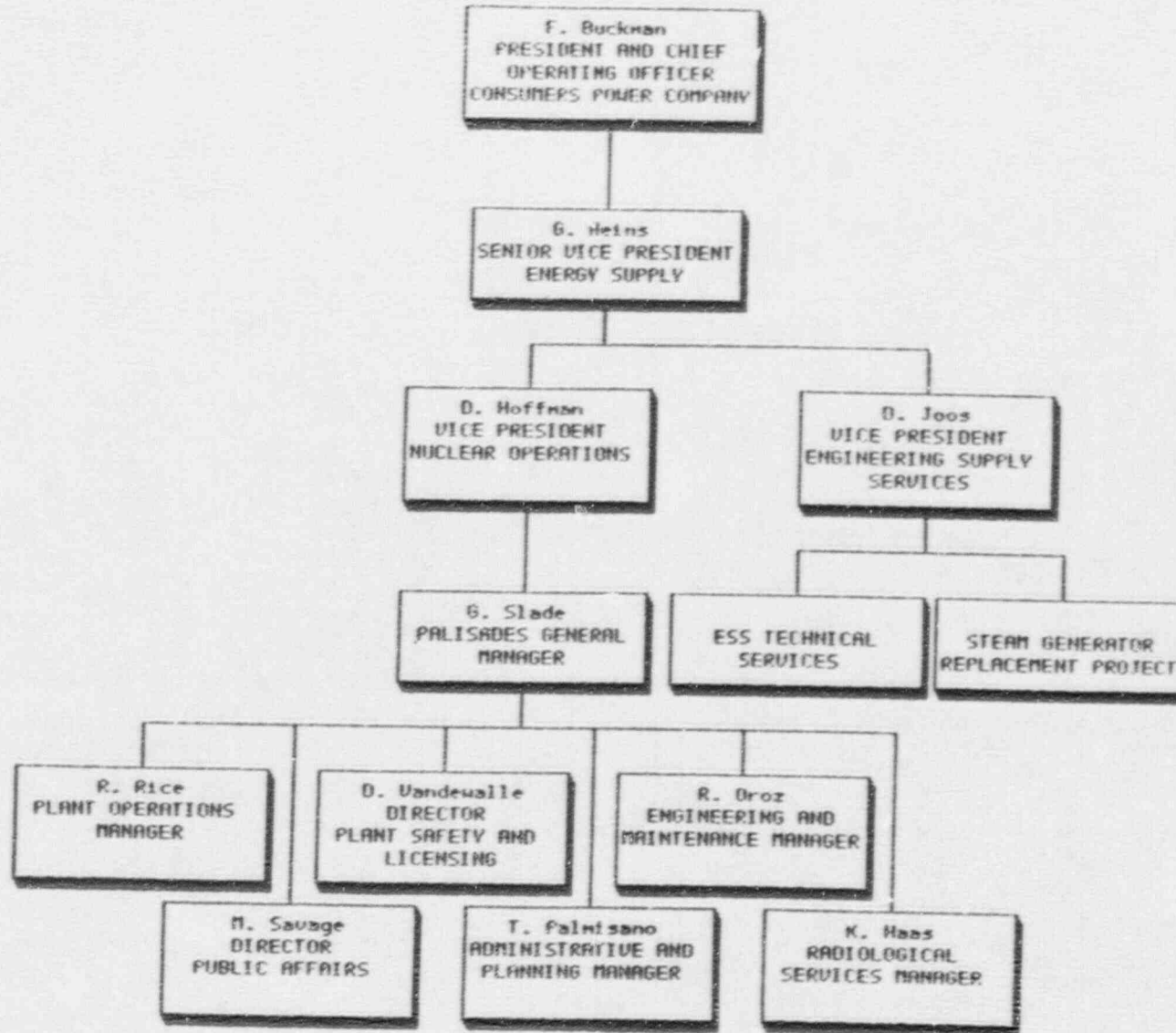
## LICENSEE EVENT REPORT (LER) HISTORY



PALISADES SALP RATINGS

<u>SALP</u>	<u>PERIOD</u>	<u>OPERATIONS</u>	<u>RADIOLOGICAL CONTROLS</u>	<u>MAINTENANCE</u>	<u>EMERGENCY PREPAREDNESS</u>	<u>SECURITY</u>	<u>E/TS</u>	<u>SA/QV</u>
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



CONSUMERS POWER COMPANY  
PALISADES PLANT

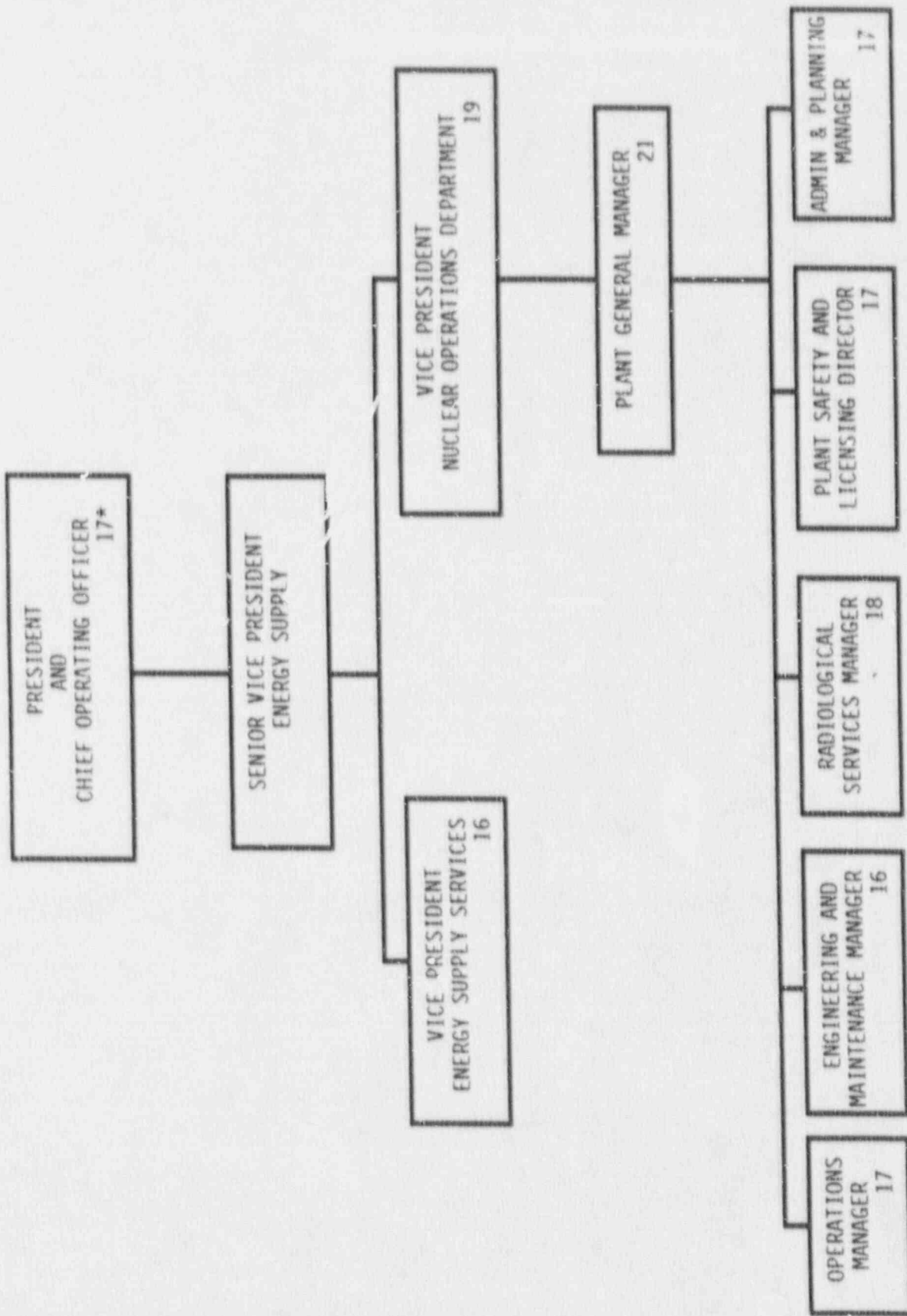
ACRS MEETING ON  
FULL TERM OPERATING LICENSE

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

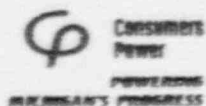
## OPERATING HISTORY

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

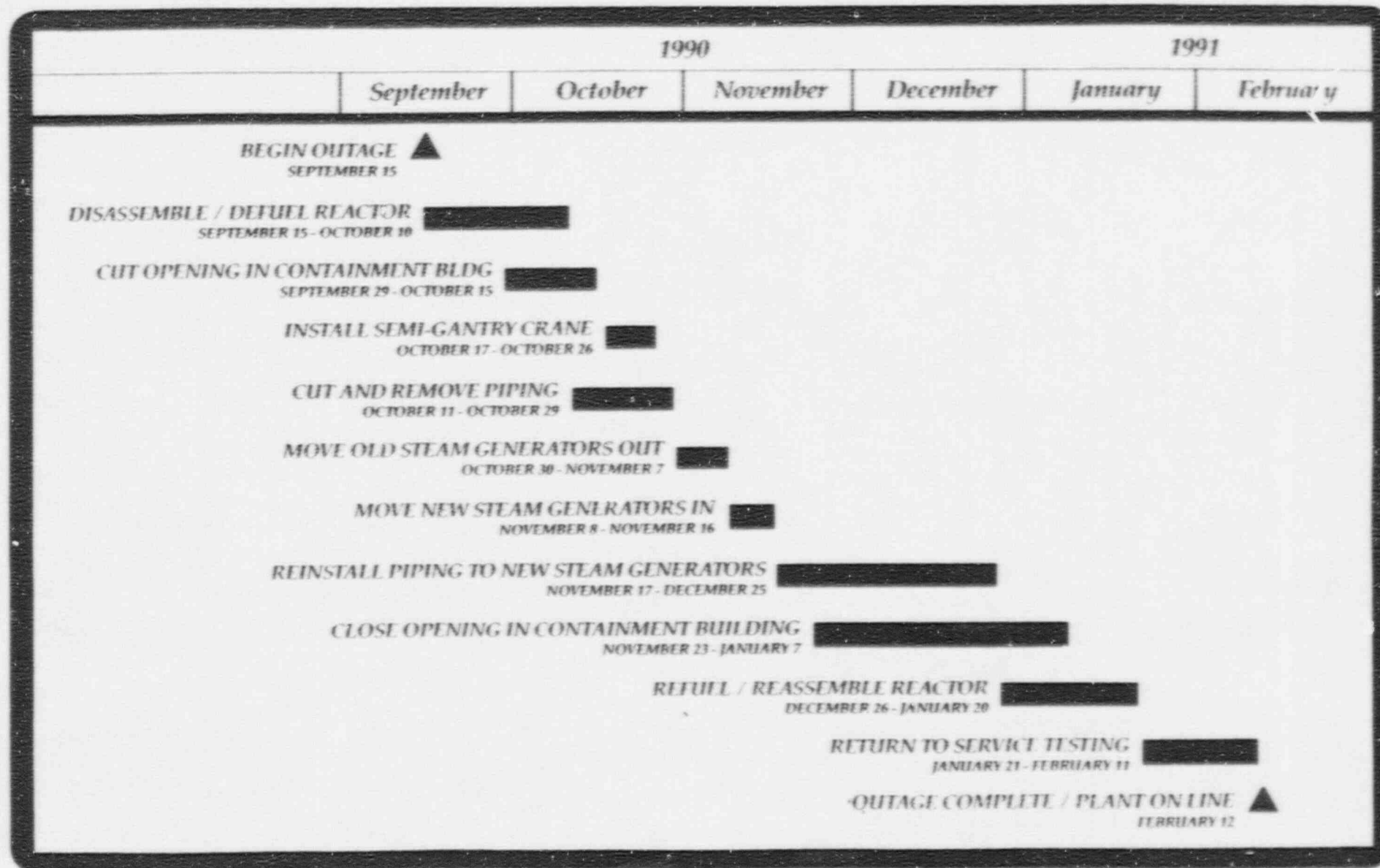


MAJOR MODIFICATIONS  
SINCE SEP

- ◆ AUXILIARY FEEDWATER
- ◆ OFFSITE POWER
- ◆ PRESSURIZER PORVs AND BLOCK VALVES
- ◆ ATWS
- ◆ INSTRUMENTATION FOR SYSTEM PERFORMANCE TESTING
- ◆ SECONDARY SYSTEM IMPROVEMENTS



# Palisades Nuclear Plant Steam Generator Replacement Project



# SGRP - FALL 1990

TOTAL, TARGET and ESTIMATED EXPOSURE

