RAS J-29

# Official Transcript of Proceedings

# NUCLEAR REGULATORY COMMISSION

Title: Hearing ITMO Pilgrim Nuclear Power Station

Docket Number: 50-293-LR
ASLBP Number: 06-848-02-LR

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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

3 ATOMIC SAFETY AND LICENSING BOARD

4 HEARING

5 ----------

6 In the Matter of: Docket No. 50-293-LR

7 ENTERGY NUCLEAR GENERATION

8 COMPANY AND ENTERGY NUCLEAR ASLBP No. 06-848-02-LR

9 OPERATIONS, INC.

10 (Pilgrim Nuclear Power Station)

11 _____

12

13 Thursday, April 10, 2008

14

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16 The hearing came to order at ~~6:30 p.m.~~ 9:06 a.m. at the

17 the Radison Hotel, 180 Water Street, Plymouth,

18 Massachusetts Administrative Judge Ann Marshall

19 Young, Chair of the panel,

20 PANEL:

21

22 Ann Marshall Young, Chair, Chair

23 Paul B. Abramson, Ph.D., Judge

24 Richard F. Cole, Ph.D., Judge

25

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TABLE OF CONTENTS

1 P-R-O-C-E-E-D-I-N-G-S

2 9:06 a.m.

3 CHAIR YOUNG: Good morning. My name is
4 Ann Marshall Young. I'm the Chair of the Licensing
5 Board. I am the lawyer member. We have one other
6 lawyer who's also a technical person and he will give
7 his expertise. My expertise is in the law, not
8 nuclear physics or nuclear engineering. I'd like to
9 start this morning by having everyone introduce
10 themselves and then I'll give a little overview of
11 what we're going to be doing and then we'll go on with
12 introduction of the pre-file testimony and the
13 exhibits and follow that up with questions of the
14 various parties' experts.

15 This is a little bit different than a
16 normal trial that you might know about from previous
17 experiences in legal proceedings or television law
18 shows. We have already received most of the testimony
19 that will be -- that will make up this hearing in
20 written form from all the parties. After all of the
21 parties filed their written direct testimony, each
22 party had an opportunity to file written rebuttal
23 testimony and to request that we ask specific
24 questions.

25 To the degree necessary, I'll go into that

1 a little bit more but let's go ahead and do the
2 introductions now and then I'll give you a little bit
3 more of an overview of what we're going to be doing
4 today.
5 Judge Abramson?
6 JUDGE ABRAMSON: I'm just Judge Abramson.
7 Let me just turn my mike on. I'm Judge Abramson.
8 Just for the record, we're here on Entergy Nuclear
9 Generation Company and Entergy Nuclear Operations on
10 the Pilgrim Nuclear Station. It's Docket Number 50-
11 293-LR. I'm both an attorney and a scientist. I'm
12 the only member of the panel who happens to straddle
13 that fence and that gives me deniability on both
14 sides. What Judge Young mentioned for you is
15 something that you really need to think very carefully
16 about if you're not familiar with our procedures, and
17 that is that we're -- first of all, we're a body
18 established by the Atomic Energy Act.
19 The Atomic Energy Act permitted the
20 Commission to establish Atomic Safety and Licensing
21 Boards consisting of three judges. We're unique in
22 this country and maybe unique in the world in that we
23 almost always have two scientists acting as Judges who
24 have an equal vote, an equal say on the matters. The
25 other thing that makes us unique is that under the

1 type of proceeding that we're conducting here, all the
2 testimony is provided in writing. That means, the
3 expert witnesses provided all their testimony in
4 writing and the expert witnesses have then provided
5 written rebuttal to that testimony in writing and
6 we've asked questions in writing to which the parties
7 have responded in writing. So we have a great deal of
8 technical information in front of us. And the purpose
9 of this hearing today is simply to allow the Judges to
10 follow-up and try to clarify what needs in our minds
11 to be clarified about the testimony that's in front of
12 us and to follow up with questions as the parties have
13 suggested to us may seem appropriate for the hearing.
14 So that's -- sorry, Ann to just pick up on
15 it but I think it's necessary that everybody
16 understand. What you're going to see today,
17 therefore, is not lawyers putting their witnesses on
18 and examining them and cross examining other parties'
19 witnesses. What you're going to see is us asking the
20 experts questions with a possibility of some
21 additional questions coming from the parties' counsel.
22 CHAIR YOUNG: Judge Cole?
23 JUDGE COLE: My name is Richard F. Cole.
24 I'm an environmental engineer. I'm an Administrative
25 Judge technical. I'm also a registered professional

1 engineer.

2 CHAIR YOUNG: Let's start over here with

3 the Applicant. Mr. Lewis, could you introduce

4 yourselves and your experts who are going to be

5 testifying today, and then can join you at the table.

6 JUDGE ABRAMSON: He has no room.

7 MR. LEWIS: They will. I thought after

8 the exhibits, the experts would come up. My name is

9 David Lewis and with me is my partner, Paul Gaukler.

10 We're with the law firm, Pillsbury, Winthrop, Shaw

11 Pittman and we have the privilege of representing

12 Entergy in this proceeding.

13 CHAIR YOUNG: Do you want to go ahead and

14 introduce your experts at this point?

15 MR. LEWIS: Yes, with us as experts are

16 Mr. Brian Sullivan, Mr. Steven Woods, Mr. William

17 Spataro and Mr. Alan Cox.

18 CHAIR YOUNG: Thank you. Ms. Uttal for

19 the staff?

20 MS. UTTAL: Thank you, your Honor. My

21 name is Susan Uttal. I am counsel for the NRC staff.

22 To my right is James Adler who is also counsel for the

23 staff. To my left is Kimbery Sexton, also counsel for

24 the staff.

25 CHAIR YOUNG: And your -- go ahead.

1 MS. UTTAL: My experts are Dr. James
2 Davis, seated right there, Andrea Keim seated next to
3 him and Terrence Chan seated next to him.
4 CHAIR YOUNG: All right, Ms. Hollis?
5 MS. HOLLIS: Yes, I'm Sheila Hollis, I'm
6 counsel to the Town of Plymouth. I'm with the firm of
7 Duane Morris. We are not presenting witnesses today.
8 Thank you.
9 CHAIR YOUNG: Thank you.
10 MS. CHEN: I'm Rebecca Chen, co-chair of
11 the Duxbury Nuclear Advisory Committee.
12 CHAIR YOUNG: You've only got one mike
13 JUDGE ABRAMSON: Speak into the mike or
14 get closer to it, so we can get it on -- can you get
15 this on the record? You're hearing them okay.
16 CHAIR YOUNG: I've just been told the
17 parties don't have your mikes on, so you might want to
18 -- yours is on now? Okay.
19 MS. HOLLIS: All right, this is Sheila
20 Hollis. I'm counsel to the Town of Plymouth and I'm
21 with the firm of Duane Morris in Washington. We will
22 not be presenting witnesses today, however. Thank
23 you.
24 CHAIR YOUNG: Thank you.
25 MS. CHEN: I'm Rebecca Chen. I'm the co-

1 chair of the Duxbury Nuclear Advisory Committee. We
2 will not be presenting witnesses today.
3 CHAIR YOUNG: Ms. Lampert?
4 MS. LAMPERT: Yes, I'm Mary Lampert. I'm
5 representing Pilgrim Watch pro se, and with me today
6 is Arnold Gundersen, who will be speaking on nuclear
7 issues and Dr. David Ahfeld, a hydrologist who will be
8 speaking on those issues and we appreciate being here.
9 CHAIR YOUNG: Thank you. Let's go in the
10 same order with the introduction of the prefiled
11 testimony and exhibits. Well, no, actually let's go -
12 - start with the applicant and then go to the
13 intervener Pilgrim Watch and the to the staff and
14 we'll conduct our questioning in the same order
15 although there may be some back and forth as we
16 indicated earlier. Mr. Gaukler, are you going to --
17 and let us know as the first exhibit for each party
18 would be your prefiled testimony and let us know right
19 at the outset whether you have any modifications or
20 corrections that you want to make.
21 MR. GAUKLER: Okay, do you want me to read
22 the exhibits that we're going to be introducing?
23 CHAIR YOUNG: Well, yes. Are there any
24 modifications or corrections to the testimony?
25 MR. GAUKLER: There are no modifications

1 to the testimony and we have two exhibits of
2 testimony, Exhibit A, which is our testimony of our
3 witnesses of January 8th, 2008 and we have Exhibit B,
4 which is the rebuttal testimony of our witnesses filed
5 March 6th, 2008. We then have all of the exhibits
6 that we prefiled with you. There's no additions.
7 They are Exhibit 1A which is a layout of the plant in
8 terms of the relevant facilities.
9 CHAIR YOUNG: Hold on one second. Do you
10 need to get those as we're going?
11 STAFF: We can't hear in the back of the
12 room.
13 MR. GAUKLER: And if I could, your Honor,
14 I'll hand out the books that you asked us to provide
15 at this time. That will be helpful to follow along.
16 CHAIR YOUNG: Okay, and then as we go, as
17 we give each exhibit an official exhibit number -- do
18 you have a microphone? No, okay. Okay, and I will
19 indicate also. So your testimony would be your
20 Exhibit 1.
21 MR. GAUKLER: No, our Exhibit A.
22 CHAIR YOUNG: Your Exhibit A we will mark
23 as official Exhibit 1. And if everyone wants to
24 follow along and keep track of those in that way. We
25 all have this already in another form but we're now

1 formally presenting it into the record.

2 MR. GAUKLER: Our exhibit list is in front

3 of that notebook.

4 CHAIR YOUNG: Okay. Does your Exhibit A

5 include your direct and rebuttal or Exhibit B is your

6 rebuttal?

7 MR. GAUKLER: Exhibit B is rebuttal.

8 Exhibit A includes the direct testimony, the signed

9 declarations supporting that testimony and the

10 curriculum vitae of each of our experts.

11 CHAIR YOUNG: Okay.

12 MR. GAUKLER: Exhibit B is our rebuttal

13 testimony of our four experts that we prefiled March

14 6th, 2008. Our Exhibit 1A is a layout of the plant

15 showing the relevant facilities and buried pipes.

16 CHAIR YOUNG: And that would be official

17 Exhibit Number 3.

18 MR. GAUKLER: Okay, Exhibit 1B is a sketch

19 of the buried pipe for the condensate storage system.

20 CHAIR YOUNG: And that would be official

21 Exhibit Number 4. We're just going to go serially

22 through all of them, so we'll only have one numbering

23 system at the end.

24 MS. LAMPERT: Excuse me, Judge. When is

25 it appropriate for me to voice an objection or is that

1 not appropriate?

2 CHAIR YOUNG: To the --

3 MS. LAMPERT: To the exhibits.

4 CHAIR YOUNG: -- prefiled exhibits?

5 MS. LAMPERT: Yeah, yes.

6 CHAIR YOUNG: Did you object to those

7 earlier in the rebuttal at any point?

8 MS. LAMPERT: No, I didn't but I wanted it

9 to get on the record that we don't object to it being

10 filed but we object to the contents and we'd like that

11 on the record.

12 CHAIR YOUNG: Of the last one?

13 MS. LAMPERT: No, that's for 1, 2 -- the

14 first two, their prefiled and their rebuttal.

15 CHAIR YOUNG: Okay, it's on the record.

16 JUDGE ABRAMSON: Excuse me, Ms. Lampert,

17 isn't it correct, more correct to say that you contest

18 the technical content, not that you object to it, but

19 you disagree with it?

20 MS. LAMPERT: I can tell you're a good

21 lawyer. That is true. I disagree with much of what's

22 in it and would like the opportunity --

23 JUDGE ABRAMSON: Yes, we understand that.

24 We understand that and that was the purpose for you

25 having filed your rebuttal testimony and that is in

1 the record. So while we'll accept your statement,
2 it's really unnecessary.
3 MS. LAMPERT: Well, you're going to have
4 to guide me along this process and I appreciate
5 guidance that you do provide.
6 MR. GAUKLER: Next is our Exhibit 2 which
7 are excerpts from the license renewal application
8 concerning the applicable aging management programs.
9 CHAIR YOUNG: And that would be official
10 Exhibit 5. Correct me if I'm wrong, Ms. Teebo
11 (phonetic) as we go along.
12 MR. GAUKLER: Our Exhibit 3 is
13 Specification Number 6498-M-306 which is a
14 specification for external surface treatment of
15 underground metallic pipe for Unit Number 1 Pilgrim
16 Station. That's our Exhibit Number 3.
17 CHAIR YOUNG: And that will be official
18 Exhibit 6.
19 MR. GAUKLER: Our Exhibit Number 4 are
20 excerpts from NUREG 1801 known as the GALL report,
21 excerpts concerning the aging management programs that
22 are relevant to this case.
23 CHAIR YOUNG: Exhibit 7. And if everyone
24 follows along and just marks those, that way when we
25 refer back to these, we won't get into the confusion

1 of which parties' Exhibit 7, if everyone identifies it
2 as official Exhibit 7 or 8 or whatever the number
3 might be, that will make it a little bit easier to
4 follow. Go ahead.
5 MR. GAUKLER: Our Exhibit Number 5 is
6 Procedure Number EN-DC-340, Rev 0, Varied Pipe and
7 Tanks Inspection and Monitoring Program.
8 CHAIR YOUNG: Official Exhibit 8.
9 MR. GAUKLER: Our Exhibit Number 6 is
10 excerpts from Appendix A of the License Renewal
11 Application concerning commitments.
12 CHAIR YOUNG: That will be Exhibit 9.
13 MR. GAUKLER: Exhibit Number 7 is excerpts
14 from the staff's Safety Evaluation Report Appendix A.
15 CHAIR YOUNG: Exhibit 10.
16 MR. GAUKLER: Our Exhibit Number 8 is
17 Appendix B.0.3 of the License Renewal Application.
18 CHAIR YOUNG: Official Exhibit 11.
19 MR. GAUKLER: And Exhibit Number 9 is
20 Entergy's answers to the Board's questions dated
21 February 11th, 2008 including the declaration and
22 curriculum vitae of Steven Bathet supporting those
23 answers.
24 CHAIR YOUNG: That would be Exhibit 12.
25 MR. GAUKLER: And that's our exhibits,

1 your Honor.

2 CHAIR YOUNG: All right.

3 MR. GAUKLER: I would move to introduce

4 them into the record.

5 CHAIR YOUNG: So moved and we will

6 introduce those into the record and they will be a

7 part of the formal record.

8 (Applicant Exhibits 1 through

9 12 were marked for

10 identification and were

11 received in evidence.)

12 CHAIR YOUNG: I guess one thing that

13 jogged my memory on, I'm sure probably all of the

14 parties are aware that the First Circuit has in a case

15 brought by the State of Massachusetts stayed the

16 closing of this hearing, so we will be keeping the

17 record open and adjourning the hearing, not completing

18 it at the end of our proceedings today.

19 Also, Ms. Lampert has filed a motion

20 asking for the same thing in order that she can

21 present something additional to us. Based on the

22 requirements of the motion rule, we will expect

23 responses to that from the parties and rule on that

24 accordingly. Ms. Lampert, why don't you go next?

25 MS. LAMPERT: Yes, the exhibits that we

1 have, we have labeled 1 as 1A, testimony of Arnold
2 Gundersen, supporting Pilgrim Watch Contention 1 of
3 March 6th, 2008. We have labeled as 1B --
4 CHAIR YOUNG: 1A will be official Exhibit
5 13.
6 MS. LAMPERT: Are we doing 1B now?
7 CHAIR YOUNG: 1B, go ahead.
8 MS. LAMPERT: Yes, again, witness Arnold
9 Gundersen, declaration supporting Pilgrim Watch's
10 Petition for Contention 1, January 26th, 2008 and is
11 CV.
12 CHAIR YOUNG: And that will be official
13 Exhibit 14.
14 MS. LAMPERT: Our Number 2 is witness
15 David Ahlfeld, his declaration regarding groundwater
16 monitoring requirements for Pilgrim, January 28th,
17 2008 --
18 CHAIR YOUNG: Let's see that would be --
19 MS. LAMPERT: -- and his biographical
20 sketch.
21 CHAIR YOUNG: Exhibit 15.
22 MS. LAMPERT: Correct. The next exhibit
23 that we labeled 3 is 10 CFR 5421.
24 CHAIR YOUNG: That's not necessary but
25 since it's always possible for regulations to change,

1 we'll go ahead and admit that as official Exhibit 16.

2 MS. LAMPERT: For history, I guess. The

3 next one, number 4, Advisory Committee on Reactor

4 Safeguards, official transcript of proceedings 485th

5 meeting September 6th, 2001, which discusses

6 reasonable assurance.

7 CHAIR YOUNG: That will be official

8 Exhibit 17.

9 MS. LAMPERT: The next one is 10 CFR

10 Appendix B to Part 50, Quality Assurance Criteria for

11 Nuclear Power Plants, NRC and NRC Inspection Manual

12 Part 9900, Technical Guidance, Operability,

13 Determination and Functionality Assessments for

14 Resolution of Degraded or Non-Conforming Conditions

15 Adverse to Quality or Safety.

16 CHAIR YOUNG: That will be Exhibit 18.

17 MS. LAMPERT: Our Number 6 is NUREG 1891,

18 Safety Evaluation Report related to the license

19 renewal of Pilgrim Nuclear Power Station, da, da, da,

20 da, buried piping in tanks inspection program.

21 CHAIR YOUNG: Exhibit 19.

22 MS. LAMPERT: Our Number 7 is Liquid

23 Radioactive Release Lessons Learned Task Force Final

24 Report, September 1st, 2006, Sections therein.

25 CHAIR YOUNG: That will be Exhibit 20.

1 MS. LAMPERT: The next one is NUREG
2 CR6876, Risk Informed Assessment of Degraded Buried
3 Piping Systems in Nuclear Power Plants Brookhaven
4 National Laboratory, there are sections therein.
5 CHAIR YOUNG: Exhibit 21.
6 MS. LAMPERT: Our Number 9 is the
7 declaration of Alan Cox in support of Entergy's motion
8 for summary disposition of Pilgrim Watch Contention 1,
9 June 5, 2007.
10 CHAIR YOUNG: Exhibit 22.
11 MS. LAMPERT: Our Number 10 is US Nuclear
12 Power Plants in the 21st Century, the Risk of a
13 Lifetime by David Lochbaum, Union of Concerned
14 Scientists and Using Reliability Centered Maintenance
15 as a Foundation for an Efficient and Reliable Overall
16 Maintenance Strategy.
17 CHAIR YOUNG: Go ahead.
18 MS. LAMPERT: I have more to say, National
19 Aeronautics and Space Administration 2001 and
20 Declaration of David Lochbaum, attesting to the facts
21 that stand by the contents of the report.
22 CHAIR YOUNG: Exhibit 23.
23 MS. LAMPERT: The next one that we
24 numbered 11 is a declaration of Alan Cox in support of
25 Entergy's motion for summary disposition of Pilgrim

1 Watch Contention 1, June 5th, 2007 and it's simply a
2 footnote number, do you want me to say all this, 6 on
3 page 11?
4 CHAIR YOUNG: If you want to. The people
5 here won't have seen it before so if you'd like to,
6 you may.
7 MS. LAMPERT: Yeah, I'm just trying to
8 figure out whether you want me to do it. It doesn't
9 matter one way or the other to me.
10 CHAIR YOUNG: Enough to let people know
11 what it is, is basically all that's necessary.
12 MS. LAMPERT: Okay, fine. Our number 12
13 is NRC preliminary notification of event or unusual
14 occurrence.
15 CHAIR YOUNG: The last one was 24. This
16 one will be 25.
17 MS. LAMPERT: Okay. The next one that we
18 labeled 13, Pilgrim Nuclear Power Station, Boston
19 Edison Company Docket 50-293, May 1972.
20 CHAIR YOUNG: That will be Exhibit 26.
21 MS. LAMPERT: The next one is the Buried
22 Piping and Tanks Inspection and Monitoring Program, a
23 document provided by Entergy.
24 CHAIR YOUNG: Exhibit 27.
25 MS. LAMPERT: Our Number 15 is United

1 States Government Accounting Office Report to the
2 Chairman's Committee on Oversight and Investigations
3 on Counterfeit and Substandard Parts.
4 CHAIR YOUNG: Exhibit 28.
5 MS. LAMPERT: Our Number 16 is an article
6 regarding seismic conditions in Southeastern
7 Massachusetts for all New England. Do you want me to
8 read it or --
9 CHAIR YOUNG: Go ahead.
10 MS. LAMPERT: New England Not Immune to
11 Strong Tremblers and Specialists say that a Major
12 Event is only a Matter of time.
13 CHAIR YOUNG: That will be Exhibit 29.
14 MS. LAMPERT: Our next one is NUREG 1891-
15 11M-32.
16 CHAIR YOUNG: That will be Exhibit 30.
17 MS. LAMPERT: Our next one is NUREG 1801
18 Volume 1, Revision 1, the GALL Report sections
19 therein.
20 CHAIR YOUNG: Exhibit 31.
21 MS. LAMPERT: Our next one that we labeled
22 19 is Pilgrim Nuclear Power Station License Renewal
23 Application Sections A and B.
24 CHAIR YOUNG: That will be Exhibit 32.
25 MS. LAMPERT: Our labeled 20 is again

1 testimony by Alan Cox, Brian Sullivan and Steve Woods,
2 William Spataro on Pilgrim Watch Contention 1, a
3 section therein.
4 CHAIR YOUNG: That will be Exhibit 33.
5 MS. LAMPERT: The next that we labeled 21
6 is an affidavit of James Davis concerning Entergy's
7 motion for summary disposition of Pilgrim Watch June
8 28th, 2007.
9 CHAIR YOUNG: That will be Exhibit 34.
10 MS. LAMPERT: The next one that we labeled
11 22 is the Office of Inspector General's Audit of NRC's
12 License Renewal Program September 6th, 2007.
13 CHAIR YOUNG: And that will be Exhibit 35.
14 MS. LAMPERT: The next one that we labeled
15 23 is a -- what is it, an event notification report
16 Number 43832 dealing with Palisades 1207.
17 CHAIR YOUNG: And that will be official
18 Exhibit 36.
19 MS. LAMPERT: Our next one labeled 24 was
20 redacted as requested.
21 CHAIR YOUNG: So that's not going to be
22 part of this record.
23 MS. LAMPERT: Right, but I'm just
24 mentioning it because that's what's in there. The
25 next one, 25 --

1 CHAIR YOUNG: I'm sorry, are there more?
2 You said that's what's in there meaning that's --
3 MS. LAMPERT: Well, what I did is I
4 submitted a page that said redacted.
5 CHAIR YOUNG: Oh, okay.
6 JUDGE COLE: The whole page.
7 CHAIR YOUNG: The whole page said
8 redacted, I see what you're saying.
9 JUDGE COLE: It was eliminated.
10 MS. LAMPERT: I wasn't sure, because --
11 CHAIR YOUNG: You substituted a page in
12 place of the previous exhibit.
13 MS. LAMPERT: Yeah.
14 CHAIR YOUNG: Okay, because I thought that
15 would follow what we had submitted as what would be --
16 MS. LAMPERT: I'm being a little creative,
17 as you know, at times, not being a trained lawyer.
18 CHAIR YOUNG: I'm sure you don't mean to
19 suggest that lawyers aren't creative.
20 MS. LAMPERT: Oh, very creative. That's
21 why I think I'm cut out for this.
22 MR. GAUKLER: Your Honor, if she could
23 pass out the copy of her exhibits that would be
24 helpful to us.
25 CHAIR YOUNG: Oh, sure. You have one

1 more. Why don't you do that and then pass those to
2 everyone and actually we should have done that before
3 but I didn't catch that. Thank you, Mr. Gaulker.
4 MS. LAMPERT: Actually, I believe I have
5 two more.
6 CHAIR YOUNG: Two more, you're right,
7 you're right, I'm sorry.
8 MS. LAMPERT: Okay, what we labeled as 25,
9 was the approximate location of the monitoring wells,
10 a document provided by Entergy.
11 CHAIR YOUNG: And that will be Exhibit 37.
12 MS. LAMPERT: Okay, and the last one is --
13 what the heck is it, oh, a combination. It is a
14 Boston Globe article discussing a discovery in Pilgrim
15 Wells fuel debate and the accompanying is a document
16 but the Massachusetts Department of Public Health on
17 that issue.
18 CHAIR YOUNG: And that will be official
19 Exhibit 38.
20 MS. LAMPERT: Great. And now shall I get
21 the documents?
22 CHAIR YOUNG: Yes, why don't you do that
23 and then while you are doing that, if the staff could
24 pass out yours and then we'll start with yours after
25 that.

1 (Pilgrim Watch Exhibits 13
2 through 38 were marked for
3 identification and were
4 received in evidence.)
5 JUDGE ABRAMSON: For those of you who are
6 not familiar with this process, all of this evidence
7 has already been previously submitted to us and we're
8 just formally putting it in the record as Judge Young
9 said, so that we can have a complete record in front
10 of us when we make our decision.
11 CHAIR YOUNG: That's right. This is the
12 NRC revised, its procedural rules in 2004 and we're
13 just now in the last year or so getting to the
14 proceedings in which we're under the new rules, so
15 this is sort of new to some extent for all of us but
16 Judge Abramson is correct, we had received all these
17 exhibits and additional information prior to today's
18 hearing and we've read those and we're now -- we're
19 now entering them all at once into the record, which
20 is a little bit different than would occur in a normal
21 -- in a traditional hearing setting.
22 Do you have what you need, Ms. Teebo?
23 THE CLERK: I'm just trying to make sure
24 I --
25 CHAIR YOUNG: Now, did we get Pilgrim

1 Watch's notebooks? Judge Abramson pointed out
2 something while we're passing these out, we have three
3 new judges in our office who are here observing this
4 proceeding and while we're doing this, we'll introduce
5 Judge Ryerson, Judge Paul Ryerson, Judge Mike Kennedy,
6 and Judge Ron Spitzer. We're glad to have them here
7 with us today. Spritzer, pardon me, Spritzer.
8 MR. GAUKLER: Your Honor, just for the
9 record, I'd like to make clear objection of exhibits
10 that we objected to in our motion in limine.
11 CHAIR YOUNG: Right.
12 MS. SEXTON: And your Honor, the staff
13 would like to do the same.
14 CHAIR YOUNG: We have previously ruled on
15 motions to exclude certain of the evidence that we
16 have just admitted now and those are not placed on the
17 record. Let me just ask everyone, when I hear someone
18 talking, it's coming from one location, so if you
19 could identify yourself, because sometimes I find
20 myself looking around trying to figure out who's
21 talking. Okay, yes.
22 MS. LAMPERT: Your Honor, when is it
23 appropriate to make a motion, if that's how you do it,
24 to enter other exhibits on the record to assure that
25 the issues that you would like -- we feel that you

1 would like to hear are before you in your decision
2 process? I understand --
3 CHAIR YOUNG: Are you talking about the
4 exhibits that you had filed earlier and that we ruled
5 that we would -- that -- I think we ruled that we
6 would not accept those at the time but that during the
7 testimony of your experts, if any of them became
8 relevant in the opinion of the experts that they could
9 present those at that time and then if there are any
10 objections, to those at that time we'll rule on those.
11 MS. LAMPERT: Thank you for clarifying
12 that.
13 CHAIR YOUNG: Okay, and that goes for all
14 the parties. I think we said that earlier. Any other
15 clarification on that? Okay, Ms. Uttal or Ms. Sexton
16 or Mr. Adler, whichever one of you is going to present
17 the staff's exhibits.
18 MS. SEXTON: Your Honor, we have a total
19 of 28 exhibits. We'll start with Staff Exhibit Number
20 1, which is the testimony of Dr. James Davis
21 concerning Pilgrim Watch Contention 1 that we filed on
22 January 29th, 2008.
23 CHAIR YOUNG: And that will be official
24 Exhibit 39.
25 MS. SEXTON: Our Exhibit Number 2 is staff

1 testimony of Terrence Chan and Andrea Keim concerning
2 Pilgrim Watch Contention 1 filed again on January
3 29th, 2008.
4 CHAIR YOUNG: And that will be Exhibit 40.
5 MS. SEXTON: We next have our rebuttal
6 testimony in responses to Board questions of Dr. James
7 Davis, Terrence Chan and Andrea Keim file on March
8 6th, 2008.
9 CHAIR YOUNG: And that's Exhibit 41.
10 MS. SEXTON: Next is a portion of that
11 GALL report on buried piping and tanks in section.
12 CHAIR YOUNG: Exhibit 42.
13 MS. SEXTON: Another section of the GALL
14 report on open cycle cooling water system.
15 CHAIR YOUNG: Exhibit 43. Another reason
16 for -- incidentally, going through the numbering of
17 these is when the experts are testifying, if you want
18 to refer to any of these exhibits, if you could maybe,
19 if necessary, the lawyer could whisper in your ear and
20 tell you what number you're talking about so everyone
21 can get to it and be looking at the same thing.
22 What was your next one?
23 MS. SEXTON: The next one is an NRC
24 generic letter, 89-13 regarding service water system
25 problems effecting safety-related equipment.

1 CHAIR YOUNG: And I believe that was your
2 Exhibit 6 which would make it official Exhibit 44.
3 MS. SEXTON: Correct, your Honor. Next we
4 have our Exhibit 7, which is a portion of the LRA on
5 buried piping and tank inspection program.
6 CHAIR YOUNG: Exhibit 45.
7 MS. SEXTON: Next is Exhibit 8 which is
8 another section of the LRA on the service water
9 integrity program.
10 CHAIR YOUNG: Exhibit 46.
11 MS. SEXTON: Exhibit 9 is a portion of the
12 SER on the service water integrity program.
13 CHAIR YOUNG: Also identified as NUREG 18-
14 91, right?
15 MS. SEXTON: Uh-huh, yes.
16 CHAIR YOUNG: Exhibit 47.
17 MS. SEXTON: Exhibit 10 is a Pilgrim
18 Document Number 99-21, "Excavation for Salt Service
19 Water Pipe Replacement".
20 CHAIR YOUNG: And that will be official
21 Exhibit 48.
22 MS. SEXTON: Exhibit 11 is NUREG 18-91 an
23 excerpt from the SER on the water chemistry control
24 BRW program.
25 CHAIR YOUNG: And that will be Exhibit 49.

1 MS. SEXTON: Exhibit 12, again NUREG 18-91
2 and excerpt from the SER, the one time inspection
3 program.
4 CHAIR YOUNG: Exhibit 50.
5 MS. SEXTON: Exhibit 13 is a letter from
6 2002 from Entergy to the NRC regarding Pilgrim Nuclear
7 Power Station Fourth Tenure In-service Testing Program
8 and Request for Approval of IST Relief Requests.
9 CHAIR YOUNG: That will be Exhibit 51.
10 MS. SEXTON: Exhibit 14 is a Pilgrim
11 Technical Specification Amendment Number 176, an
12 excerpt.
13 CHAIR YOUNG: Exhibit 52.
14 MS. SEXTON: Exhibit 15 is an excerpt from
15 Pilgrim FSAR on the condensate storage system.
16 CHAIR YOUNG: Exhibit 53.
17 MS. SEXTON: Number 16, another excerpt
18 from the FSAR on the quality assurance program.
19 CHAIR YOUNG: Exhibit 54.
20 MS. SEXTON: Exhibit 17 is a 2005 letter
21 from Entergy to the NRC regarding Pilgrim Fourth
22 Tenure In-service Inspection Program Plan and the
23 associate relief requests for NRC approval.
24 CHAIR YOUNG: And that will be Exhibit 55.
25 MS. SEXTON: Exhibit 18 is an NRC

1 Inspection Procedure Attachment 71111.07 issued in
2 2006 on heat sink performance.
3 CHAIR YOUNG: That will be Exhibit 56.
4 MS. SEXTON: Exhibit Number 19 is a 2006
5 letter from the NRC to Entergy regarding Pilgrim
6 Nuclear Power Station NRC Integrated Inspection
7 Report.
8 CHAIR YOUNG: And that will be Exhibit 57.
9 MS. SEXTON: Exhibit 20 is an excerpt from
10 the FSAR on the salt service water system.
11 CHAIR YOUNG: That will be Exhibit 58.
12 MS. SEXTON: Exhibit 21 is a generic
13 letter from 1991, number 91-18 regarding information
14 to licensees regarding two NRC inspection manual
15 sections on resolution of degraded and non-conforming
16 conditions and on operability.
17 CHAIR YOUNG: That will be Exhibit 59.
18 MS. SEXTON: Number 22 is an NRC
19 regulatory issue summary 2005-20, revision to guidance
20 formerly contained in NRC generic letter 91-18,
21 information to licensees regarding two NRC inspection
22 manual sections on resolution of degraded and non-
23 conforming conditions and on operability.
24 CHAIR YOUNG: That will be official
25 Exhibit 60.

1 MS. SEXTON: Exhibit 23, NUREG 1891, an
2 excerpt from the SER, staff's review process.
3 CHAIR YOUNG: That will be official
4 Exhibit 61.
5 MS. SEXTON: Exhibit 24, an NRC bulletin
6 from 1987, Number 87-01, bending of pipe walls in
7 nuclear power plants.
8 CHAIR YOUNG: That will be official
9 Exhibit 62.
10 MS. SEXTON: Number 25 is an excerpt from
11 the book "Corrosion Induced by Lower Energy
12 Radionuclides, Strategy for Controlling Corrosion".
13 CHAIR YOUNG: And that will be Exhibit 63.
14 MS. SEXTON: 26 is an NRC inspection
15 manual from 2007, inspection procedure 35-101 quality
16 assurance program implementation inspection for
17 operational programs.
18 CHAIR YOUNG: That will be official
19 Exhibit 64.
20 MS. SEXTON: Number 27 is the affidavit of
21 Dr. James A. Davis and Andrea Keim in response to
22 Licensing Board questions in the order contained --
23 Board questions for the NRC staff and Applicant.
24 CHAIR YOUNG: That will be Exhibit 65.
25 MS. SEXTON: And finally, Number 28 is NRC

1 Region 3 report excerpt from the service water system.
2 CHAIR YOUNG: And that will be official
3 Exhibit 66.
4 MS. SEXTON: And at this time, your Honor,
5 we'd like to move those into the record.
6 (NRC Staff Exhibits 39 through
7 66 were marked for
8 identification and were
9 received in evidence.)
10 CHAIR YOUNG: All the parties' exhibits
11 are now in the official record, in the official
12 evidentiary record. All rejected exhibits are in the
13 record for purposes of appeal as opposed to the
14 evidentiary record which we just entered the exhibits
15 into.
16 Next, if I could have all of the witnesses
17 who are going to be testifying to stand and I'll swear
18 you in.
19 MR. GAUKLER: Your Honor --
20 CHAIR YOUNG: I'm not going to swear you
21 in separately but it's just as if I were. If you
22 could raise your right hand, please.
23 (Witnesses Sworn)
24 CHAIR YOUNG: Thank you, the record
25 reflects that all have said they do. Let's start with

1 Entergy's experts and if you could all come up to the
2 table so that you'll have a microphone to pass around
3 between you as necessary.
4 MS. LAMPERT: Excuse me, your Honor. Is
5 the plan to have opening statements or is that --
6 CHAIR YOUNG: I'm sorry, you're so right.
7 We did promise that each party would have 10 minutes.
8 MS. LAMPERT: I've spent a long time
9 preparing it.
10 CHAIR YOUNG: Thank you. Thank you for
11 bringing that to my attention. You can still come sit
12 up there with your lawyers if you'd like. And we'll
13 do that in the same order as we said before. Again,
14 we're all getting used to this new process. New is a
15 relative term, of course. Okay, Mr. Lewis, go ahead.
16 MR. LEWIS: Good morning and welcome to
17 Plymouth. Entergy is pleased to appear before you
18 today to address the sole remaining contention raised
19 by Pilgrim Watch in this proceeding. This remaining
20 contention is Pilgrim Watch's challenge to the
21 adequacy of Entergy's programs for managing the aging
22 of the buried piping. Entergy's prefile testimony in
23 this proceeding describes those programs and
24 demonstrates the adequacy of those programs and I
25 won't repeat that testimony. I'll just emphasize a

1 couple of points.

2 First, Energy's aging management programs

3 are consistent with the GALL report. The GALL report

4 was the NRC staff's extensive effort to compile aging

5 operating experience and to define the elements of

6 aging management programs that have been shown to be

7 effective based on that operating experience. Entergy

8 is consistent with those programs and we would submit

9 that is substantial evidence of the adequacy of our

10 programs.

11 The GALL report makes clear that an aging

12 management program consisting of coatings and

13 protective features to prevent corrosion from

14 occurring coupled with opportunistic and periodic

15 inspections is an effective program for managing the

16 aging of buried piping and that position in the GALL

17 report is corroborated by the expert testimony of

18 Entergy's witnesses as well as the expert testimony of

19 the NRC staff's witnesses.

20 Entergy's programs have those protective

21 features in them. There are two buried systems within

22 the scope of this proceeding because of the definition

23 of the contention. One is the salt water service

24 system. That salt water service system is protected

25 externally by coatings and wraps and it's protected

1 internally by a cured in place epoxy liner.
2 Similarly, the condensate storage system lines are
3 stainless steel and even though stainless steel is
4 resistant to corrosion, those are also externally
5 wrapped to prevent corrosion from occurring.
6 Despite those protective features which
7 will prevent corrosion from occurring, we also have
8 committed to the opportunistic and periodic
9 inspections to insure that those coatings remain
10 intact and remain effective in preventing degradation
11 from occurring. Pilgrim Watch wants monitoring wells
12 and I believe it's no secret that they want monitoring
13 wells to protect the environment. We've argued on a
14 number of occasions that that's outside the scope of
15 the proceeding and I believe that's consistent with
16 the Board's rulings. I just want to emphasize though
17 that that does not mean that groundwater protection is
18 unimportant to Entergy. It's very important to
19 Entergy and that is why we've undertaken the
20 groundwater protection issue outside of the license
21 renewal and outside of this proceeding.
22 That's why we've installed monitoring
23 wells, again, and they're not part of our aging
24 management programs and they're not part of this
25 proceeding but I just want to emphasize that we're not

1 ignoring groundwater protection. It's just an aspect
2 of plant operations that's addressed day to day under
3 our existing programs and the Commission has said,
4 therefore, aren't part of this proceeding.
5 I think Pilgrim Watch is also disappointed
6 that those programs have been voluntary. I don't
7 think that's really -- it doesn't speak badly of
8 Entergy at all. We have done more than we were
9 required by the regulations, but in fact, the
10 Commission has recently promulgated a proposed rule to
11 look at making onsite subsurface surveys part of its
12 requirements. Again, it's not part of this proceeding
13 but it also shows that this is also important to the
14 NRC and it's also being addressed on a real time basis
15 outside this proceeding. That's all I have.
16 CHAIR YOUNG: Thank you. Ms. Lampert.
17 MS. LAMPERT: Yes, first, as everybody
18 knows, I am not a lawyer, so any error I make in this
19 proceeding does not reflect disrespect for the process
20 but my unfamiliarity and I appreciate any guidance,
21 Judge, your Honor, that you feel appropriate to
22 provide.
23 So we feel that the aging management
24 program is insufficient as it stands. The orders
25 question was does it provide appropriate assurance as

1 required under relevant regulations that the pipes
2 will not develop leaks so great as to cause those
3 pipes to be unable to perform their intended
4 functions. So the order properly assumes that during
5 the license renewal period, it's not acceptable for
6 the pipes to develop significant leaks or otherwise
7 become unable to preform their safety function.
8 Whether there is a backup system is irrelevant.
9 The question is not whether there will be
10 a disaster if the pipes fail; rather it's whether the
11 aging management program provides assurance that they
12 will not fail. In other words, the issue is whether
13 monitoring wells in conjunction with a sufficient
14 aging management program are required to provide
15 appropriate assurance that significant leaks will not
16 develop. And the only way to assure that is to detect
17 small leaks, breaks and significant corrosion before
18 the leaks have had an opportunity to grow.
19 Monitoring wells can detect small leaks
20 before they grow into large ones and proper inspection
21 can help find potential locations of small leaks
22 before there is a large scale failure. The aging
23 management programs can be put into two buckets,
24 inspection and mitigation. The problem with the
25 inspection program is many fold. There is a one-time

1 inspection during a 10-year period before license
2 renewal, a one-year inspection within the first 10
3 years of license renewal and inspections that just
4 might happen or might not happen to occur.
5 What's wrong? First the inspections are
6 too infrequent. It rests upon an incorrect assumption
7 that you can predict corrosion, that it is gradual.
8 We know that there is what is called the bathtub curve
9 as a component becomes older then the corrosion rate
10 increased, it is not linear and therefore, more
11 frequent inspections are required, irrespective of
12 maintenance.
13 Maintenance can help but maintenance
14 cannot stop corrosion. I am well-maintained. I've
15 had a good diet all my life and I look in the mirror
16 and I'm very different than I was 40 years ago and
17 those buried pipes are very different than they were
18 at that period of time. Further, the inspections are
19 -- the sampling regime is -- does not inspect enough
20 of a component or maybe not all the components. It
21 again, is based upon a improper false assumption that
22 corrosion is even across a component. And we know
23 from their own documents that I would like to
24 introduce that they know this, too. They know that
25 manufacturing errors, installation errors, do not

1 necessarily happen evenly across a component.

2 They know, too, that in the making of a

3 component, it might look nice and shiny but it is not

4 homogenous across and furthermore, there are areas

5 within a pipe that are more susceptible to damage, so

6 therefore, you have to have more frequent samplings

7 and their excuse that to do so excavation would risk

8 damaging is a false excuse because there are many

9 technologies available that are non-invasive to detect

10 corrosion that do not require digging up and risking

11 the excavation process.

12 Also, and this is key, their program does

13 not require a baseline inspection now so we know what

14 there is now. They define baseline as what it was

15 like before they put it in the ground. No. We're

16 talking about going forward and without knowing where

17 you're starting, just like when you go to buy a house,

18 you have a thorough inspection to plan what you're

19 getting into, to plan your inspections and

20 replacements. They should be required to do this so -

21 - and before the license is granted, so we have an

22 understanding of the exact condition of what these

23 pipes are now and then determine, have you determine

24 whether what they're saying makes sense to develop in

25 other words, a corrosion rate by having a base of

where we are now and then having progressive records as you move along.

Also, they have not had a soil analysis. Soil resistivity is a very important element. They have not done this as they should right now, to determine what, in fact, they would need. And as far as a monitoring well program, Dr. Ahlfeld will discuss what they have and how it is inadequate and how a well designed monitoring well program, you can think of it as guards outside a prison, should be designed.

Monitoring wells are an important aspect. They are not by any means off the record because monitoring wells can serve to detect leaks so that the leaks do not become so great as to interfere with a significant and important functions of these pipes. Monitoring wells have a variety of functions. We aren't talking about it going offsite and getting into your lobster that you eat in Washington DC. We're talking about monitoring wells as another arrow in the quiver, if you will, of inspections.

Then another aspect of the aging management program is preventative measures, mitigation, again, they've failed. They assume and imply that the metals are corrosion resistant. All metals, all metals corrode period, both the stainless

1 steel and the carbon steel. They assume and say in
2 their documents that the soil is non-corrosive. The
3 soils here are very acid. The very pipes are besides
4 sea water. Sea water has oxygen, chloride, microbes,
5 whatever you call those things, all of these elements
6 that are highly corrosive and how can they say because
7 the last time they looked, tested soil was in 1992,
8 according to their documents in one area by the south
9 salt water discharge.
10 Wraps and liners, they provide -- they
11 continuously said it right now that they provide
12 assurance. Their own documents that I want to
13 introduce say explicitly that you cannot count on
14 wraps. You cannot count on liners because a, they do
15 not have a guaranteed life because companies won't
16 give it for very obvious reasons. There are too many
17 variables that can deteriorate the liners, improper
18 putting them in place, et cetera, so we have to see
19 these exhibits because it undercuts one of their main
20 arguments.
21 In fact, they say in their own documents
22 that we can't consider wraps and liners. Instead we
23 have to deal with the corrosion of the metal itself.
24 Cathodic protection is another very important
25 mitigative measure. You heard in their testimony that

1 they are in compliance with the GALL report. The
2 funniest thing, they never mention Section 11M 28 of
3 the GALL report which explicitly says there should be
4 cathodic protection and it also mentions the problems
5 of handling et cetera. Chemistry control, they've
6 had a history of chemistry control, nothing earth-
7 shaking but it certainly isn't 100 percent and deals
8 quite obviously simply with one avenue of pipe
9 corrosion which is from the interior, has nothing to
10 do with the exterior.
11 So what I would say, it's quite clear to
12 us is their program is insufficient. It must be
13 supplemented by establishing critical baseline data
14 requiring corrosion rates, perform a soil resistivity
15 test and prove the surveillance frequency and
16 coverage, install cathodic protection, put in a decent
17 monitoring well program.
18 And our suggestions are not big buck
19 items. This is nothing that's going to cost the
20 industry a great deal of money and it seems to us the
21 only conclusion that they are resisting this is
22 because perhaps they fear finding a hole and having to
23 fix it and so, what they are unwilling to risk is
24 spending extra money and time looking but they're
25 willing to risk our safety and I want to mention

1 something important.

2 Everyone seems to have forgotten that

3 there are three pipes under consideration here, not

4 simply two pipe systems. There's a salt water service

5 discharge that may have radioactive contamination.

6 There is the condensate system piping that has

7 contamination. No one's disagreeing with that.

8 However, the standby offgas treatment system piping,

9 again, according to their own documents that I want to

10 be able to present to you today, says that it has the

11 potential for liquid and wetness from the condensation

12 of the cooler soil and the warmer interior, like the

13 inside of your car.

14 And so in your order, I read it until I

15 had to get stronger glasses actually, it did not

16 indicate how much radioactive liquid. It simply said

17 pipes that have radioactive liquid in them and again,

18 according to their own documents, we then, must

19 consider the standby offgas treatment system piping in

20 our review.

21 CHAIR YOUNG: Which order are you

22 referring to?

23 MS. LAMPERT: Which order, I forget all

24 the numbers.

25 CHAIR YOUNG: The original one or the one

1 that --

2 MS. LAMPERT: No, no, no, okay, let me

3 think. It was either the October, November '07.

4 CHAIR YOUNG: The ruling on summary

5 disposition of Contention 1 probably is the one you're

6 --

7 MS. LAMPERT: Yes, probably. And then you

8 reaffirmed it when I submitted a motion saying if you

9 were taking offsite contamination off the table, then

10 we should be able to consider and broaden our view to

11 consider all pipes, all buried pipes and tanks under

12 scope and then again, your response, your denial of

13 the motion was that, "Oh, no, we are only -- we're

14 sticking to pipes with radioactive liquids". And

15 there was not a determination whether it could be a

16 cup or many gallons, at least that's what I'm

17 suggesting that we consider. So anyway, thank you

18 very much for the opportunity.

19 CHAIR YOUNG: Thank you. Staff?

20 MS. SEXTON: Your Honor, we believe that

21 the staff's position that the aging management

22 programs for buried piping and tanks have been

23 adequately made clear in the staff's initial

24 statements, the rebuttal and in our witness'

25 testimony, thank you.

1 CHAIR YOUNG: Thank you. All right, we've
2 done all the introductory things that we need to do at
3 this point. Let's take a five-minute break and then
4 come back and start with the questioning.
5 (A brief recess was taken.)
6 CHAIR YOUNG: All right, if we could come
7 to order. The way in which we're going to proceed is
8 a little different. Again, we're on somewhat new
9 territory here. The way in which we're going to
10 proceed is a little different than in a traditional
11 hearing. We're going to proceed by topic and then as
12 I had indicated earlier, at some point, we will allow
13 any followup issues to be raised but by addressing
14 things according to topic, that will take us back and
15 forth as we said earlier between the experts of the
16 various parties rather than going completely with
17 Entergy's experts on all topics and then Pilgrim
18 Watch's and then the staff's.
19 Any questions about that? Yes?
20 MS. LAMPERT: You don't even have to ask.
21 When you say you are -- will allow questions, will
22 that follow each subject? You know --
23 JUDGE ABRAMSON: Let me speak to this.
24 I've done a number of proceedings under these rules
25 and our approach has been that at this point, we've

1 seen everything from all the experts in writing and
2 our approach now is to follow up with questions aimed
3 at helping us understand where there are gaps or where
4 we think we still need further information or we need
5 to clarify the record.
6 So what I'll be doing, what Judge Cole
7 will be doing, I can't speak for what Judge Young will
8 be doing but what Judge Cole and I will be doing is
9 topically going down areas where we have remaining
10 questions that need clarifying. All the evidence, all
11 the testimony is in front of us. So we're looking for
12 clarifications.
13 If at the end -- what I will do and what
14 I expect Judge Cole will do is at the end of our
15 questions on a particular topic, we will ask all
16 parties whether there is anything particularly focused
17 on the topic we've been making questions on that they
18 think we've missed. That is not an opportunity to
19 broaden the inquiry beyond that in my mind. It's very
20 focused. I'm going to ask questions about specific
21 things and if I've missed something and the lawyers or
22 the experts think we've missed something on that
23 particular topic, we're interested in hearing it but
24 we're not interested in hearing something that's not
25 on a question that we've asked.

1 Now, Judge Cole and Judge Young may take
2 a different approach. That's my approach.
3 MS. LAMPERT: And what about if a topic
4 isn't brought forward, then at the end of this
5 proceeding can we bring up topics from our knowledge
6 of this issue and our assumptions that would be then
7 appropriate to bring forward as a wrap up at the end?
8 CHAIR YOUNG: I think all the way through,
9 the answer to your first question obviously was, yes,
10 we will be trying to wrap up everything on the topics
11 as we go and at the end if there are any additional
12 items that are out there, then we'll hear from the
13 parties on those. And when I say hear from the
14 parties, we may not agree to address all the issues
15 you would want to raise but we won't foreclose you
16 from at least asking to raise it.
17 MS. LAMPERT: I appreciate it, and I don't
18 mean to be pesty about this but I'm trying to get
19 these rules straight so it will go smoothly.
20 CHAIR YOUNG: All right.
21 JUDGE COLE: And I'll try to comply with
22 that by topic but I prepared my questions slightly
23 differently. I read through a piece of testimony and
24 I prepared my questions as I went through the entire
25 testimony but I will try to comply with keeping it in

1 categories.

2 CHAIR YOUNG: All right. So we'll do the

3 best we can. Go ahead, Judge Abramson.

4 JUDGE ABRAMSON: Okay, well, let me start

5 with a little background information just so you can

6 understand where I'm coming from with the questions

7 that I have remaining at this point. Under our

8 regulations, in 10 CFR 54.21, there are definitions of

9 what must be contained in an application. And

10 54.21(a)(1) says that for system structures and

11 components within the scope of this part as delineated

12 in 54.4, list the structures and components that are

13 subject to an aging management review.

14 And what we have is a contention about the

15 aging management program. Going on through 54.21 and

16 54.21(a)(3) our regulations require that for each

17 structure and component identified in that earlier

18 section, the applicant's application must demonstrate

19 that the effects of aging will be adequately managed

20 so that the intended function, and that's the key, the

21 intended function will be maintained consistent with

22 the current licensing basis for the period of extended

23 operation.

24 Now, Pilgrim Watch, and I'm paraphrasing,

25 in their initial contention, arguing that the aging

1 management plan was insufficient for a number of
2 reasons. It didn't -- in their view, they argued it
3 didn't provide for adequate inspection of all the
4 systems, structures and components that might contain
5 radioactively contaminated water and there was no
6 adequate monitoring to detect if and when leakage from
7 those areas occurred and that some of them included
8 underground pipes and tanks which the aging management
9 program and inspection programs do not effectively
10 inspect and monitor and then they asserted that
11 monitoring wells should be placed between the plant
12 and the ocean to supplement that aging management
13 program.
14 We went through a lot of iterations trying
15 to get the scope of what was actually in front of us
16 proper and the best statement in my mind is a
17 statement from a January 11th order where Judge Cole
18 and I speaking for the majority said, that the
19 determination the agency must make in this instance is
20 whether or not the Applicant has programs and
21 procedures in place which enable it to determine
22 whether buried pipes and tanks containing radioactive
23 fluids are able to satisfy their intended safety
24 function despite leaks, i.e., to determine that there
25 are not leaks at such great rates so as to cause those

1 pipes and tanks to fail to satisfy those safety
2 functions.
3 Now, the functions are spelled out also in
4 our regulations. In Section 54.4, it says the
5 intended functions are spelled out that the systems
6 have to fulfill are laid out in 54.4(a) and these all
7 relate to design basis events which are very severe
8 events. So with that, what I'd like to do is to pick
9 up and start with the Applicant and ask counsel and
10 experts for the Applicant to describe for us which
11 components or systems might contain radioactive fluid
12 that are now left in the scope of the program? Which
13 systems and components are necessary for the purposes
14 described in 54.4 which is the scope of the
15 proceeding. Mr. Sullivan, do you want to talk about
16 that or have one of your experts talk about that.
17 MR. SULLIVAN: Mr. Cox is going to answer
18 that question.
19 JUDGE ABRAMSON: All right, thank you, Mr.
20 Cox.
21 MR. COX: As we've pointed out in the
22 license renewal application, the systems that contain
23 radioactive -- potentially contain radioactive liquid
24 that are needed to meet this requirement are the salt
25 service water system and the condensate storage

1 system.

2 JUDGE ABRAMSON: Okay, and help me now,

3 the salt water service system bring water from

4 basically the ocean into the plant to remove heat

5 through a heat exchanger that takes heat out of the

6 plant in a primary loop and those two loops are only

7 connected if there's a leak through a heat exchanger;

8 is that correct?

9 MR. COX: That's correct. It actually

10 removes heat from reactor building closed cooling

11 water loop which is an intermediate loop between the

12 salt service water system and the systems that are the

13 primary systems.

14 JUDGE ABRAMSON: Now, the pipe that brings

15 the salt water from the sea to the plant would not be

16 expected to contain radioactive water, is that correct

17 or if it did it would be radioactive water that wasn't

18 there as a result of the plant unless it got in and

19 was being pumped back in, right?

20 MR. COX: That's correct.

21 CHAIR YOUNG: I know this is going to be

22 difficult because there's only one microphone for all

23 of you but could you maybe pull it a little bit closer

24 as you talk because you're not coming across real

25 well. Thank you. I probably didn't then either.

1 JUDGE ABRAMSON: What is the safety
2 function of the salt water -- what's the intended
3 function of the salt water service system as it fits
4 within Section 54.4? What brings that within the
5 scope of this? How does the salt water service --
6 where is the salt water service system relied upon to
7 meet one of the criteria of 54.4(a)(1) or yeah,
8 (a)(1).
9 MR. COX: We included it in the scope both
10 for 54.4(a)(1) and for 54.4(a)(3). (a)(3) is a
11 regulated event and it's credited in that scenario for
12 safe shutdown considerations after a fire.
13 JUDGE ABRAMSON: After fire.
14 MR. COX: Right.
15 JUDGE ABRAMSON: Okay, so the only piece
16 of the salt water service system that might contain
17 radioactive fluid, however, is the pipe taking the
18 effluent back -- taking the water back to the ocean
19 from the heat exchanger; is that correct?
20 MR. COX: That's correct, of the buried
21 piping, that is the only portion that could contain
22 radioactive materials from the plant.
23 JUDGE ABRAMSON: And what kind of failure
24 of that pipe could feasibly under any circumstances,
25 cause it to fail, cause it to cause the salt water

1 service system to fail to meet its intended function
2 of removing heat from the heat exchanger?
3 MR. COX: The only failure of that portion
4 of the piping that could do that would be a total
5 collapse that somehow blocked off the flow path so
6 that you could get no flow either out on the ground.
7 If the flow runs out on the ground, it still goes to
8 the ocean. If it get through any part of the pipe,
9 it's still at the ocean. So it would take I guess
10 what we believe to be an incredible type of failure
11 that's not been seen that it would totally block off
12 the flow of that discharge pipe.
13 JUDGE ABRAMSON: And how big is that pipe,
14 diameter?
15 MR. SULLIVAN: Twenty-two inches.
16 JUDGE ABRAMSON: Twenty-two inches, inside
17 diameter, outside diameter?
18 MR. COX: I believe it's the OD.
19 JUDGE ABRAMSON: OD. So it's something
20 like 20 inches? What's the thickness of the pipe?
21 MR. COX: It's around 20 inches by the
22 time you take in the count, the pipe wall and the pipe
23 -- cure in place pipe lining inside.
24 JUDGE COLE: And there are two of them.
25 MR. COX: That's correct.

1 JUDGE ABRAMSON: Are they in parallel?
2 Are the redundant systems?
3 MR. COX: There are two loops that are
4 redundant.
5 CHAIR YOUNG: I'm going to ask just for my
6 purposes, not being a technical person and not being
7 real good with all the acronyms that tend to fly
8 around, they're not as familiar to me, when you use an
9 acronym like OD, overall diameter is that --
10 MR. SULLIVAN: Outside.
11 JUDGE ABRAMSON: Outside diameter, okay.
12 Could you maybe try to remember to include what that
13 acronym stands for just for the record and to assist
14 me? Thanks.
15 JUDGE ABRAMSON: Yeah, I'll try to do that
16 same in my questioning. Sorry, Judge Young.
17 So it's approximately 22 inches inside
18 diameter, wall thickness is something like an inch; is
19 that correct, or less? What's the approximate wall
20 thickness?
21 MR. SULLIVAN: Three-eighths inch wall
22 thickness.
23 JUDGE ABRAMSON: Three-eighths inch wall
24 thickness and what's the material?
25 MR. SULLIVAN: It's carbon steel.

1 JUDGE ABRAMSON: Carbon steel and how deep
2 is it buried approximately?
3 MR. SULLIVAN: I'm going to turn this over
4 to Mr. Woods.
5 MR. WOODS: Salt service water piping
6 discharge to the outtake is buried at approximately
7 seven to 10 feet below grade level.
8 JUDGE ABRAMSON: Have you ever in the
9 operating experience or inspection experience, seen
10 any obstruction to that, any material obstruction to
11 that outlet pipe?
12 MR. WOODS: No.
13 JUDGE ABRAMSON: Is there any history of
14 events that could cause that kind and size of a pipe
15 to become completely blocked?
16 MR. WOODS: Not that I'm aware of, no.
17 JUDGE ABRAMSON: Let me pick up with the
18 staff. Does the staff have any technical input on the
19 questions I've been asking? Are you -- are the
20 answers that we've had about the regulations that
21 govern this and how this pipe fits, are they the
22 correct regulations?
23 DR. DAVIS: This is Dr. Davis.
24 JUDGE ABRAMSON: Would you get a little
25 closer, Dr. Davis, please? It may not be turned on.

1 DR. DAVIS: I agree with what they've
2 stated.
3 JUDGE ABRAMSON: A little close, please,
4 Dr. Davis. Let's make sure everybody in the back can
5 hear you.
6 CHAIR YOUNG: Mr. Woods was real good.
7 Try to imitate him.
8 JUDGE ABRAMSON: Good. For those of you
9 in the back who couldn't see, they disconnected the
10 microphone.
11 CHAIR YOUNG: This is technical stuff.
12 JUDGE ABRAMSON: No, it was the lawyer who
13 disconnected it.
14 (Laughter)
15 JUDGE ABRAMSON: She knew what she was
16 doing. We're going to get you some expert help.
17 CHAIR YOUNG: We're sorry we didn't have
18 more microphones.
19 DR. DAVIS: I agree with everything that
20 they said.
21 JUDGE ABRAMSON: Can you hear in the back?
22 (No)
23 JUDGE ABRAMSON: Get closer, Dr. Davis.
24 Put it right up like you're singing.
25 DR. DAVIS: I agree with what they say,

1 completely.

2 JUDGE ABRAMSON: Thank you.

3 JUDGE COLE: Can you hear that in the

4 back? Okay.

5 JUDGE ABRAMSON: Does Pilgrim Watch

6 experts have any input as to whether this statement of

7 the regulations was correct?

8 MS. LAMPERT: No, I don't believe they do

9 but I'll let them speak for themselves. They know the

10 regulation is correct. We wonder about the assumption

11 of going to failure as opposed to preventing a failure

12 to occur.

13 JUDGE ABRAMSON: That's not what I was

14 asking about, though.

15 MS. LAMPERT: No, I was just --

16 JUDGE ABRAMSON: I understand where you're

17 coming from.

18 MS. LAMPERT: You know, once I had --

19 JUDGE ABRAMSON: But please let's deal

20 just with the questions I'm asking. I'm trying to

21 clarify some very technical matters.

22 CHAIR YOUNG: Let me interrupt here. I

23 think it would be helpful if we keep in mind that the

24 questions are for the experts. So, you know, if you

25 want them to bring out something, you can say

1 something to them and they can bring it out, but
2 otherwise, the only thing that constitutes evidence is
3 the testimony of the experts. And you're doing real
4 well as a lawyer given the fact that you're not a
5 lawyer, but they're the experts, so we'll let them
6 answer the question.
7 MS. LAMPERT: They are experts.
8 CHAIR YOUNG: Yes.
9 JUDGE ABRAMSON: So let me ask the
10 questions and I'm going to ask it in two parts of the
11 experts. First of all, do you have any opinion as an
12 expert about whether the view of the applicant and the
13 staff of what are the governing regulations is correct
14 or not?
15 MR. GUNDERSEN: I guess I would -- the
16 intended function of the pipe is four-fold and I think
17 the discussion only perhaps discussed three of the
18 four. So I guess what is the intended function I
19 think I have a clarification.
20 JUDGE ABRAMSON: Let's hear it.
21 MR. GUNDERSEN: Okay. And by the way,
22 everybody has gotten my name spelled correctly so far
23 but I am s-e-n, Gundersen, I just want to get that on
24 the record early. I think the pipe has to do four
25 things. One is that it has to get enough water at

1 enough pressure from one point to another.

2 CHAIR YOUNG: We're on the service water,

3 right?

4 JUDGE ABRAMSON: We're talking about the

5 salt water service discharge pipe only.

6 MR. GUNDERSEN: Yes. The second issue si

7 that a failure cannot create enough back pressure to

8 reduce the flow through the system. The third is that

9 a structural failure from a design basis event can't

10 be the event which creates that increase in back

11 pressure which may limit the effectiveness of the

12 system and given that we have the Kapan (phonetic)

13 Earthquake which is less than 300 years old, one of

14 the most severe in New England, I think that a

15 degraded pipe could fail in such as a way as a result

16 of a design basis event that could adversely effect

17 the back pressure on that system which would limit

18 that water through the heat exchanger.

19 JUDGE ABRAMSON: Now, as I understand

20 there are two parallel systems and let me ask the

21 Applicant, the parallel systems, with either one

22 enable the system to meet its intended function?

23 MR. SULLIVAN: Yes, it will. They are

24 redundant systems.

25 JUDGE ABRAMSON: So they are redundant

1 systems. Mr. Gundersen, what in your mind, is the
2 likelihood of one of those earthquake events causing
3 both pipes to fail in a manner that created such back
4 pressure and what's the basis for that view?
5 MR. GUNDERSEN: Well, information provided
6 by Entergy by Pilgrim indicates that the walls are
7 below the standard thickness that they already quoted.
8 We have a document which is not yet on the record
9 which is a condition report from three years ago which
10 indicates that the wall thickness is only .49 and the
11 condition report indicates that the walls in that
12 particular system have degraded to a point where
13 they're below standard. So the initial seismic
14 evaluation of those components at the thicker wall, is
15 now no longer valid and so I think --
16 JUDGE ABRAMSON: So are you saying that
17 the pipe does not conform to the current licensing
18 basis requirement?
19 MR. GUNDERSEN: Well, the condition report
20 is pretty specific. It says that --
21 CHAIR YOUNG: Let me interrupt here. Is
22 this one of the documents that have not yet been
23 placed in the record, or is this one of the other
24 documents, because if you're referring to something
25 that's not yet in the record, this would be the time

1 to --

2 JUDGE ABRAMSON: Well, let's --

3 CHAIR YOUNG: -- present that and ask that

4 it be considered.

5 JUDGE ABRAMSON: -- let's hear what Mr.

6 Sullivan wants to say about this first and then --

7 MR. LEWIS: Mr. Lewis.

8 JUDGE ABRAMSON: I'm sorry, Mr. Lewis,

9 sorry.

10 MR. LEWIS: We would object to the late

11 exhibit. We also object to the characterization. The

12 condition report that Mr. Gundersen refers to is not

13 related to the pipe metal thickness, it relates to the

14 cured in place piping. It also doesn't relate to

15 degradation. It was a minor discrepancy in the

16 installation that was evaluated in engineering, but

17 again it relates to the interior liner, not the steel

18 and it's the pipe that's relied on to meet the seismic

19 stresses.

20 JUDGE COLE: Excuse me, I thought Mr. Cox

21 said that the diameter of the pipe was three-eighths

22 inches. That's --

23 JUDGE ABRAMSON: No, the thickness of the

24 --

25 JUDGE COLE: I'm sorry, the thickness of

1 the pipe was three-eighth inches.

2 MR. COX: That's correct. The nominal

3 wall thickness of the pipe is .375 or three-eighths

4 inches. The cured in place pipe that's inside the

5 pipe, the lining is a nominal thickness of

6 approximately a half an inch.

7 JUDGE COLE: Okay, thank you.

8 CHAIR YOUNG: Could I clarify something?

9 JUDGE COLE: So you're referring to the

10 thickness of the liner, sir?

11 MR. GUNDERSEN: Yes, well, the number I

12 heard earlier was three-quarters and that was

13 presented in the initial dialogue. And the

14 combination of the liner and the wall is where the

15 three-quarters came from. I question whether the

16 liner is really as thick as it's --

17 JUDGE ABRAMSON: Mr. Gundersen, let's come

18 back to this. You have a --

19 CHAIR YOUNG: Let me clarify something

20 before we go on. We mentioned two pipe system, a

21 backup system. Are you talking about another service

22 water pipe or are you talking about another pipe that

23 would normally fulfill another function being used as

24 a backup?

25 MR. COX: We're talking about the same

1 pipe. It's the two loops of the discharge pipe from
2 the salt service water system to the bay.
3 JUDGE COLE: They're referred to as Loops
4 A and B?
5 MR. COX: That's correct.
6 JUDGE ABRAMSON: Let's see if I've got
7 this right.
8 CHAIR YOUNG: So the backup -- so that
9 backup that you're talking about is if one failed, the
10 other one would work. They're both service water
11 pipes, discharge pipes.
12 MR. COX: That is correct.
13 JUDGE ABRAMSON: And each of those pipes
14 is approximately 22-inch outside diameter, three-
15 eighths inch steel and each has an internal liner
16 that's approximately half in thick which is cured in
17 place.
18 MR. COX: That is correct.
19 JUDGE ABRAMSON: Okay, and Mr. Gundersen,
20 as I understand the question that you're raising
21 relates to the thickness of this internal cured in
22 place lining pipe, not to the actual three-eighth inch
23 structural pipe that contains it, is that correct?
24 MR. GUNDERSEN: That particular condition
25 report address the thickness of the liner, yes, yes.

1 CHAIR YOUNG: And Mr. Lewis, did you have
2 anything to respond to that? I think you raised
3 earlier that, indeed, was the distinction that you
4 were making.
5 MR. LEWIS: Well, I was objecting one, to
6 the exhibit as untimely, but two, also as irrelevant
7 because the cured in place piping inside it is not
8 relied on to meet the seismic stresses. The metal,
9 the three-eighths inch thick metal piping on the
10 outside is what's relied on to meet the various
11 stresses that pipe has to see under its service
12 conditions. And therefore, this condition report has
13 no relevance to the ability to meet seismic stresses.
14 CHAIR YOUNG: But in terms of the overall
15 relevance to the ability of the pipes to withstand or
16 to perform their functions without leaking it would be
17 relevant to that, right?
18 MR. WOODS: The cured in place liner that
19 we're discussing here, the minimum wall thickness
20 required was .45 inches. From that we took 10 percent
21 and added 10 percent to that .45 and came up with a
22 nominal wall thickness of .495 and that was used in
23 the original calculation. From that it was -- you
24 take the closest nominal actual felt thickness that's
25 impregnated with the epoxy which is approximate a half

1 an inch. So the actual minimum wall required is .45
2 inches and all measurements taken exceed that .45
3 inches that were taken as samples.
4 CHAIR YOUNG: But the thickness of the
5 internal liner, if I'm using the wrong term, correct
6 me, but the thickness of that would be relevant to the
7 ability of the pipe to perform its functions without
8 leaking, right?
9 MR. WOODS: That is correct and .450
10 inches is the minimum required wall thickness.
11 JUDGE ABRAMSON: Let's pursue this a
12 minute.
13 CHAIR YOUNG: So you're saying that that
14 minimum thickness pertains to what Dr. Gundersen
15 raised because the internal liner had not gone below
16 that thickness. Is that what you're saying?
17 MR. WOODS: That's correct.
18 CHAIR YOUNG: Okay, so we probably need to
19 rule on these proposed exhibits as they come along.
20 JUDGE ABRAMSON: And I'm okay with this
21 particular exhibit and I think I want to pursue this.
22 CHAIR YOUNG: Well, then let's --
23 JUDGE ABRAMSON: Mr. Lewis, do you have a
24 concern here?
25 MR. LEWIS: No, I would like to see the

1 exhibit. If it does come on, I'd like to make sure
2 it's the complete condition report and also shows the
3 engineering disposition reflecting that it doesn't
4 create a problem.
5 JUDGE ABRAMSON: Do you have a copy of the
6 complete report, Mr. Gundersen, or is it just
7 excerpts?
8 MR. GUNDERSEN: Hang on, we'll see.
9 CHAIR YOUNG: Pass them out to the parties
10 and then --
11 JUDGE ABRAMSON: While you're passing that
12 out, let me pursue this. While you're passing that
13 out, let me pursue this. Mr. Gundersen, you started
14 out by saying that you were concerned that this pipe
15 could collapse because a condition indicated that the
16 pipe itself was much thinner than expected. Now what
17 we're hearing is that, in fact, the condition report
18 that you're concerned about relates to an internal
19 liner inside a three-eighths inch thick, 22-inch
20 outside diameter carbon steel pipe as to which this
21 particular condition report does not apply, right? It
22 only applies to the liner; is that correct?
23 MR. GUNDERSEN: Does my yes concur with
24 your whole question or just the last part?
25 JUDGE ABRAMSON: No, does it, does it --

1 MR. GUNDERSEN: The condition report
2 relates to the liner, yes.
3 JUDGE ABRAMSON: Okay. And now, would you
4 explain to me why that condition report is relevant to
5 the ability of this particular pipe or to the
6 likelihood that this particular pipe within a pipe, if
7 you will, or pipe surrounding a pipe, could become
8 completely blocked in a way that it would fail to
9 allow water to go back from the heat exchanger to the
10 ocean?
11 MR. GUNDERSEN: Okay. If the pipe were at
12 thick as it were designed without any failures, and
13 essentially in its original condition back in '72, or
14 as its designed with the current licensing basis, the
15 thickness were as analyzed, either one of those two
16 pipes would provide the adequate redundancy. My
17 concern is that either one of the --
18 JUDGE ABRAMSON: Loop A or Loop B you
19 mean?
20 MR. GUNDERSEN: Yes, either Loop A or Loop
21 B, if they were as -- if they were in the condition as
22 originally designed, either loop would provide the
23 redundancy to adequately cool the plant if the other
24 loop failed for whatever reason.
25 My concern and indicated by liner failures

1 and failures in that service water system is that the
2 -- and by photographs provided by Pilgrim of what
3 appear to be pinhole leaks ganging up in one area,
4 would weaken the pipe in locations that have not been
5 analyzed in the original design basis calculations.
6 So it's the liner thickness issues, the fact that
7 these pipes have since about 1998 begun to fail, it's
8 those indications that lead me to be concerned about
9 the integrity of the pipe in the event of a design
10 basis event like a Kapan Earthquake.
11 I ran a structural engineering group of
12 about 70 people at one point and this is an easily
13 testable hypothesis. You could do a finite element
14 analysis on that pipe.
15 JUDGE ABRAMSON: To do a finite element
16 analysis, on the pipe I presume you'd have to know the
17 current state of the pipe, otherwise an analysis would
18 be meaningless, right?
19 MR. GUNDERSEN: That's correct.
20 JUDGE ABRAMSON: And how would you get
21 that current -- the current state of the pipe, go
22 measure it every six inches all the way its entire
23 length?
24 MR. GUNDERSEN: No, I think you could do
25 an internal volumetric inspection or --

1 JUDGE ABRAMSON: And if you did an
2 internal volumetric inspection, this is a lined pipe,
3 would you not get information on the liner and not on
4 the three-eighth inch carbon steel pipe that contains
5 it?
6 MR. GUNDERSEN: No, I think with the
7 internal inspections, especially the face ray
8 approaches I think you could get a good indication of
9 the condition of the entire pipe, not just the liner.
10 CHAIR YOUNG: I am going to interject from
11 time to time to make sure I understand what you are
12 saying, what the various experts are saying from a
13 non-technical standpoint. Is what you are saying that
14 if there were several places where there was a
15 degradation of the liner so that there could be some
16 lessening of the thickness of the pipe, if there were
17 several places relatively close together, then if
18 there were a design basis event, that would cause that
19 portion of the pipe to fail, sort of to crumple in on
20 itself so that that would block the discharges? Did
21 I understand that correctly?
22 MR. GUNDERSEN: That is correct, Your
23 Honor.
24 CHAIR YOUNG: Okay.
25 JUDGE ABRAMSON: Let's pick this up

1 because when you say it "could," what would you
2 suspect is -- from the information that you have seen
3 on this pipe, in your professional judgment, what is
4 the likelihood that there are regions of this pipe
5 that are so degraded that in the event of a design
6 basis earthquake, that pipe could wholly collapse on
7 itself, blocking flow?
8 MR. GUNDERSEN: Pilgrim provided two
9 photographs. And we have them. They're not on the
10 docket yet as an exhibit, but we have two photographs
11 provided by Pilgrim which show not a single hole.
12 Even a large single hole is not my concern.
13 These photographs show a broad attack of
14 several smaller holes which have grown into larger
15 holes.
16 JUDGE ABRAMSON: They show that on the
17 liner, correct, or do they show it on the outer pipe?
18 MR. GUNDERSEN: There is not a lot of
19 information with the photographs, Your Honor. So I am
20 really not sure. It appeared to be through-wall to
21 me.
22 CHAIR YOUNG: And we are talking about --
23 MR. GUNDERSEN: And it appeared to be an
24 attack on the metal, not the liner.
25 CHAIR YOUNG: These are the same types

1 that we're talking about here, the photographs of --
2 MR. GUNDERSEN: Pilgrim provided
3 photographs. And it is not clear which system those
4 --
5 JUDGE ABRAMSON: And is there a reason
6 that you have not discussed this particular matter in
7 your testimony, either your prefiled testimony or your
8 rebuttal testimony?
9 MR. GUNDERSEN: I think I did discuss the
10 issue of structural weakening of the pipe in my --
11 JUDGE ABRAMSON: And did you refer to
12 either? Did you refer to these photographs or this
13 condition report in your testimony to support it?
14 MR. GUNDERSEN: No, I did not. I wanted
15 to introduce it today.
16 JUDGE ABRAMSON: Why did you not refer to
17 it at that point? This is a very late moment to be
18 trying to bring up new information. Now, we are not
19 saying that we can't consider it, but we would
20 certainly like to understand why if you feel so
21 strongly now -- I don't want to hear from you, Ms.
22 Lampert.
23 MS. LAMPERT: Oh, I was going to --
24 JUDGE ABRAMSON: I want to hear from the
25 expert why when you wrote your expert testimony you

1 did not refer to these things.

2 MR. GUNDERSEN: My experience led me to

3 write the expert report just on my experience. And

4 counsel had not provided me with those photographs

5 when I wrote the report. It was based on my

6 experience at other facilities.

7 CHAIR YOUNG: Is this one of the exhibits

8 that you had recently proposed be admitted that were

9 --

10 MR. GUNDERSEN: Yes, it is.

11 CHAIR YOUNG: -- part of the Entergy

12 disclosures?

13 MR. GUNDERSEN: Yes, it is, Your Honor.

14 JUDGE ABRAMSON: Have you seen these

15 exhibits?

16 MR. SULLIVAN: We have not seen these

17 exhibits. I would like to mention that prior to

18 lining the pipes, we did a complete visual inspection

19 of them looking for any evidence of deterioration, of

20 degradation prior to lining the pipes because we would

21 not want to put the liner in the pipes, you know,

22 covering up something that was degraded.

23 So we did an inspection of the piping and

24 ensured that the piping was in good material condition

25 before we lined the pipes with the epoxy liner.

1 JUDGE ABRAMSON: And what year was that
2 done approximately?
3 MR. SULLIVAN: Approximately 2001 and 2003
4 on the alpha, bravo loops, not respectively.
5 JUDGE ABRAMSON: Let's come back to this
6 exhibit. And then let's hear about these photographs
7 and find out what they are.
8 CHAIR YOUNG: All right. I think that we
9 are in agreement on --
10 JUDGE ABRAMSON: Well, let's see. Has the
11 applicant had a chance to look at this condition
12 report?
13 MR. LEWIS: It is not a complete document.
14 I will try in a break to obtain the complete document
15 and maybe be able to provide it so a complete document
16 can be put in.
17 I notice that portion that's provided
18 doesn't represent the disposition, which is that this
19 wasn't a condition averse to quality. I think if a
20 document comes in, it ought to be a complete document
21 or it's inherently unreliable.
22 JUDGE ABRAMSON: I agree. I would like to
23 see the whole document.
24 CHAIR YOUNG: All right. Next break see
25 if you can get that. Go ahead and introduce this part

1 and then submit it later?

2 JUDGE ABRAMSON: No. Either we get the

3 whole thing or we don't. I think we could do it later.

4 MR. LEWIS: Would you want also the

5 photographs?

6 JUDGE ABRAMSON: Yes. I would like to see

7 the photographs. Can we get the photographs

8 distributed to everybody so we can see them?

9 MR. LEWIS: Let me just say two things on

10 the photographs. First of all, I don't recall -- I

11 will go back and check, but I don't recall those being

12 one of the supplemental exhibits that the Pilgrim

13 Watch asked to introduce.

14 Second, the photographs that we provided

15 in our disclosures were photographs of the portions of

16 the saltwater service discharge piping that were

17 replaced. So they are not photographs of the existing

18 in-service portions of the pipes.

19 JUDGE ABRAMSON: So let's try to find out

20 what photographs Mr. Gundersen is talking about, and

21 then we can decide. If they were, in fact, parts that

22 were replaced, that gives us useful information. If

23 they are some other photograph, let's find out what

24 the applicant says they are.

25 Do you have those photographs with you,

1 counsel?

2 MS. LAMPERT: Yes.

3 MR. LEWIS: Yes.

4 JUDGE ABRAMSON: Okay. Let's get those to

5 the applicant so they can take a look at them.

6 Does the staff know anything about either

7 this condition report or the photographs that are

8 being discussed?

9 MS. UTTAL: I don't think we got the

10 photographs either because I don't think that they

11 were in the exhibits that she tried to get in late.

12 CHAIR YOUNG: Let's try to clarify that.

13 And also let me just say the procedure here. If you

14 proffer, if you give us an exhibit that you would like

15 to have introduced, either we will allow that or not

16 allow that. If we allow it, we will give it an

17 official exhibit number and place it on the official

18 exhibit list.

19 If we don't and you would like to have it

20 placed in the record as an offer of proof, make that

21 request at the time. And that way it will be in the

22 record for appeal, even though it's not part of the

23 evidentiary record.

24 And could you also refer back after you

25 pass those out to the original list of the proposed

1 late-filed exhibits so that we could identify where
2 that came on that list if it did?
3 MS. LAMPERT: Yes. What I did --
4 CHAIR YOUNG: And also when you give them
5 to us, give one to --
6 JUDGE ABRAMSON: Make sure you give it to
7 the applicant first because they are the ones who are
8 going to have to provide us information on what it is.
9 MS. LAMPERT: Oh, okay. Is that going to
10 be --
11 CHAIR YOUNG: Just give it to everyone,
12 all the parties and then us.
13 JUDGE ABRAMSON: These are exactly what
14 you got. This is not --
15 MS. LAMPERT: This is it. It didn't have
16 any identification on it.
17 JUDGE ABRAMSON: Okay.
18 CHAIR YOUNG: We probably need to avoid
19 talking like this. The court reporter needs to get
20 everything you say.
21 JUDGE ABRAMSON: Ms. Lampert, did these --
22 MS. LAMPERT: Yes?
23 JUDGE ABRAMSON: -- photographs have any
24 identification on them at all?
25 MS. LAMPERT: No. They had that Bates

1 number, I believe it's called, on the bottom. And
2 that was it. It didn't say where it was, when it was
3 taken. It just had the Pilgrim identification that
4 was in a disk disclosure that was provided.
5 And I apologize to my witness because when
6 I first got involved in this, I saw the quarter beside
7 it. And I thought, what the heck, you know, this
8 isn't that big, as opposed to a trained expert looking
9 at it and seeing all the pinholes and what it actually
10 does tell. And so I apologize.
11 JUDGE ABRAMSON: That's okay.
12 MS. LAMPERT: But I also want to add that
13 these are numbered, as Judge Young asked me. These
14 are numbered. And so they indicate whether they have
15 been provided as late-filed or not.
16 And those that haven't been provided in,
17 what, 20 days ago, then I thought that the rules say
18 we could offer exhibits at the hearing and if they
19 were denied, as you explained, give an offer of proof
20 or whatever that is.
21 CHAIR YOUNG: So you are saying that this
22 -- I think it should be marked 53.
23 (Whereupon, the aforementioned
24 item was marked for
25 identification as Exhibit

1 Number 53.)

2 CHAIR YOUNG: This was one of the list?

3 MS. LAMPERT: No.

4 CHAIR YOUNG: This was not one of the

5 list?

6 MS. LAMPERT: No.

7 CHAIR YOUNG: This was something separate?

8 MS. LAMPERT: Right, yes.

9 JUDGE ABRAMSON: This is an exhibit which

10 was not preferred in your last proposed additional

11 exhibits. Is that correct?

12 MS. LAMPERT: That is correct.

13 JUDGE ABRAMSON: What led you to believe

14 that these relate to the saltwater service outlet

15 pipe?

16 MR. GUNDERSEN: They were provided by

17 Entergy as part of this process.

18 JUDGE ABRAMSON: And did Entergy identify

19 them as being related to the saltwater service pipe or

20 could this be a picture of any piece of plate or

21 anything? What makes you think this is saltwater

22 service piping?

23 MR. GUNDERSEN: I know there have been

24 failures in the saltwater service piping and, among

25 other failures. But that is a system which had

1 failures. And it was provided as part of this docket.
2 So, you know, there's --
3 JUDGE ABRAMSON: But could it have been
4 some other pipe in the docket? I am asking a very
5 specific question. What makes you believe this is
6 saltwater service pipe.
7 MR. GUNDERSEN: There's only three pipes
8 on this docket. And the saltwater service pipe is
9 carbon steel. This appears to be an attack in carbon
10 steel.
11 JUDGE ABRAMSON: Okay. So, applicant, do
12 you recognize either of these photographs?
13 MR. SULLIVAN: Yes, Judge, we do recognize
14 these photographs. This was material that was found
15 degraded in 1999. Mr. Woods will speak to that in a
16 moment, to the details of it.
17 It was found as part of our salt service
18 water system integrity program that will show us that
19 we do periodic monitoring of the integrity of the
20 piping and the integrity of the salt service water
21 system.
22 The specific details of this Mr. Woods
23 will discuss.
24 JUDGE ABRAMSON: Okay. Please?
25 CHAIR YOUNG: Just to clarify, you found

1 this during a periodic inspection?

2 MR. WOODS: That is correct.

3 CHAIR YOUNG: And how frequent was that

4 particular type of periodic inspection?

5 MR. WOODS: We originally did an

6 inspection in 1995 of the internal existing rubber

7 liner that was in the salt service water discharge.

8 CHAIR YOUNG: That was originally --

9 MR. WOODS: Original rubber liner. That

10 is correct.

11 JUDGE ABRAMSON: And what are these

12 photographs of?

13 MR. WOODS: These photographs are from

14 1999, when an inspection was done and they found

15 degraded through-wall leak. And that spool piece was

16 actually dug up and removed and replaced.

17 JUDGE ABRAMSON: What was this? Is this

18 a photograph of the pipe, --

19 MR. WOODS: This is a photograph --

20 JUDGE ABRAMSON: -- 3/18 pipe?

21 MR. WOODS: -- of the three-eighths-inch

22 pipe with the rubber liner removed. And the external

23 surface of the carbon steel is coated. And that was

24 removed basically to look at the external portion of

25 the pipe to see how the pipe wrap did and identified

1 that it was from the internal to the external
2 through-wall leak.
3 CHAIR YOUNG: You used the term "spool
4 piece."
5 MR. WOODS: Section of pipe.
6 CHAIR YOUNG: Okay. And as to the
7 periodicity of it, if that's the right term, how often
8 did you do those?
9 JUDGE ABRAMSON: Frequency.
10 CHAIR YOUNG: Frequency.
11 MR. WOODS: In 1995, an inspection was
12 done and noted a little bit of degradation on the
13 existing rubber lining. And then it was determined to
14 go ahead and do another inspection in 1997 to monitor
15 that area. And that was okay at the time.
16 And then we looked at it again in 1999 and
17 found that the rubber lining had actually -- a portion
18 of the rubber had delaminated and actually torn away
19 from it and, as a result, had the through-wall leak.
20 So at that point in time, we replaced that section of
21 pipe.
22 CHAIR YOUNG: Did you do the periodic
23 inspection --
24 AUDIENCE MEMBER: Can you get the
25 microphone? Can you speak into the microphone?

1 CHAIR YOUNG: Did you do the periodic
2 inspections every two years as a matter of course or
3 did you do them in '97 and '99 because you had noticed
4 something in '95? What I was trying to get at is, how
5 often would you normally do these periodic inspections
6 of that pipe?
7 MR. SULLIVAN: Well, in a general sense,
8 we would inspect it as much as we thought we needed to
9 inspect it. But, just to provide some clarification,
10 this section of piping was cut out, was replaced, as
11 Steve discussed. And the piping has subsequently been
12 lined with the epoxy liner. And the current
13 inspection period is ten years on epoxy.
14 CHAIR YOUNG: It's ten years. That's what
15 I was trying to get to. Thank you.
16 JUDGE ABRAMSON: Now, this was discovered
17 as part of your ongoing operation and maintenance
18 process. Is that correct?
19 MR. SULLIVAN: That is correct.
20 JUDGE ABRAMSON: And before you lined it,
21 you inspected the entire length of the pipe of both
22 loop A and loop B?
23 MR. SULLIVAN: That is also correct.
24 JUDGE ABRAMSON: And did you find any
25 degradation of either pipe?

1 MR. SULLIVAN: We did not find any
2 degradation. We were looking for degradation of the
3 rubber lining.
4 JUDGE ABRAMSON: Of the rubber lining?
5 MR. SULLIVAN: Of the rubber lining.
6 That's correct.
7 JUDGE ABRAMSON: And then was the rubber
8 lining removed and the new failed epoxy lining put in?
9 MR. SULLIVAN: The rubber lining --
10 MR. WOODS: We did find one area of
11 degradation approximately eight foot in from the very
12 end of the discharge. UT readings were taken. And
13 that was slightly below the min. wall. And welded
14 overlay was done.
15 CHAIR YOUNG: Minimum wall?
16 MR. WOODS: Minimum wall thickness. A
17 weld overlay was performed on that area to build that
18 wall back up. So the entire pipe that was exposed
19 from the rubber lining missing did meet the wall
20 thickness required.
21 JUDGE ABRAMSON: And then tell us a little
22 bit about how you put the new cured-in-place lining.
23 And did you take the rubber liner out or did you put
24 --
25 MR. WOODS: No. The rubber liner stayed

1 in place. And that was inspected 100 percent visually
2 to make sure it was intact and in good shape. And
3 that's where we found the one place that was torn. We
4 did the weld overlay to build up the wall thickness of
5 the existing steel pipe.
6 And then the cured-in-place liner was put
7 in on top of the existing rubber liner.
8 JUDGE ABRAMSON: So the existing rubber
9 liner was at that point complete and intact. So you
10 had no evidence of any leaks in that liner at that
11 point?
12 MR. WOODS: That is correct.
13 JUDGE ABRAMSON: Visual evidence was what
14 we got. And then you installed inside that a new
15 epoxy-impregnated felt liner. Is that correct?
16 MR. WOODS: Yes, that is correct.
17 JUDGE ABRAMSON: Okay. So what we have
18 now is three-eighth-inch thick, 22-inch outside
19 diameter carbon steel pipe lined by a rubber liner.
20 And that is lined by this epoxy liner, which is
21 impregnated into felt. Is that correct?
22 MR. WOODS: Yes.
23 JUDGE ABRAMSON: And what is the -- okay.
24 So is there any evidence that would lead you to
25 believe there is degradation of the three-eighth-inch

1 carbon steel pipe to a state which would cause it not
2 to meet its current licensing basis?
3 MR. WOODS: No, not at all.
4 JUDGE ABRAMSON: Does the staff have any
5 comment on that? Staff does oversight here.
6 DR. DAVIS: Yes. I agree with what they
7 say.
8 JUDGE ABRAMSON: Speak into the mike
9 again, Dr. Davis, please.
10 DR. DAVIS: Every time they have looked at
11 the external coating, which is in the buried pipe and
12 tanks inspection program, it has been intact after 36
13 years with no degradation. The only degradation they
14 have seen is from the inside.
15 CHAIR YOUNG: We are talking about the
16 inside now, though, right?
17 DR. DAVIS: Yes.
18 JUDGE ABRAMSON: Yes.
19 DR. DAVIS: But that is not part of the
20 buried pipe and tanks inspection program, just to make
21 it clear. It's part of --
22 JUDGE COLE: That just deals with the
23 outside of the pipe.
24 DR. DAVIS: That's right. This is part of
25 the service water integrity program.

1 JUDGE ABRAMSON: So, just to repeat, we
2 have got parallel systems, both at this point
3 identical with the exception of whatever aging might
4 have happened to them. Is that correct?
5 So that we have got two pipes, two
6 parallel systems, which can remove the heat. Each one
7 of them has this same configuration: An outside
8 carbon steel pipe, lined by rubber, lined by an
9 epoxy-impregnated felt liner.
10 DR. DAVIS: That is correct.
11 JUDGE ABRAMSON: That is correct? And
12 those liners were installed, the new liners were
13 installed, in '01 and '03?
14 DR. DAVIS: That's correct.
15 JUDGE ABRAMSON: Mr. Gundersen -- Judge
16 Young, what do we want to do about these photographs?
17 Does the applicant, now having discussed these
18 photographs, have any objection to these being
19 admitted into evidence.
20 MR. LEWIS: No objection.
21 JUDGE COLE: Are these photographs part of
22 the 40-foot section that was replaced?
23 MR. WOODS: Yes.
24 JUDGE COLE: And there were 2 40-foot
25 sections?

1 MR. WOODS: That is correct.

2 JUDGE COLE: Is this a photograph from

3 each of the separate sections?

4 MR. WOODS: No. This is a photograph of

5 both sides of that piece of metal.

6 JUDGE COLE: Okay. Same piece, then?

7 MR. WOODS: Right.

8 JUDGE COLE: Thank you.

9 MR. WOODS: On one side is the internal

10 diameter portion, and the other picture is the

11 external diameter portion of the --

12 JUDGE ABRAMSON: When those 2 40-foot

13 sections were removed, were there any other

14 through-wall penetrations?

15 MR. WOODS: No.

16 JUDGE ABRAMSON: This is the only one?

17 MR. WOODS: Yes.

18 JUDGE ABRAMSON: What diameter is this is

19 approximately a quarter? That was at a quarter

20 sitting on there that I can see for comparison?

21 CHAIR YOUNG: I think that's what they

22 said.

23 MR. WOODS: Yes, that's a quarter.

24 JUDGE ABRAMSON: Okay. So we are looking

25 at something that is maybe three-quarters of an inch

1 in diameter for all, no other evidence of degradation?

2 JUDGE COLE: You know, looking at these

3 two photographs, both of them look like the top side

4 of the pipe based upon the curvature.

5 CHAIR YOUNG: I think this was more --

6 just to take care of this formality here, I am going

7 to be interrupting when we need to do this. The pipe

8 has been identified. You have indicated that there is

9 no objection to it.

10 Did staff have any objection?

11 MS. UTTAL: No objection.

12 CHAIR YOUNG: All right. Then that will

13 be entered as exhibit 67.

14 (Whereupon, the aforementioned

15 item was marked for

16 identification as Exhibit

17 Number 67 and was received in

18 evidence.)

19 CHAIR YOUNG: Do we have original photos

20 or are we putting in a copy like the one we --

21 JUDGE ABRAMSON: Is this what was actually

22 distributed to them, do you think, in the record?

23 These came off a disk, you said, right?

24 MR. LEWIS: I know the photograph -- yes,

25 we produced our documents in disclosure on CDs. I

1 know the document that we produced was a color
2 photograph that had much better clarity than this.
3 CHAIR YOUNG: If you want to substitute
4 that, you can do that. We will go ahead and introduce
5 it now. And if you want to substitute the actual
6 photograph or a better printout of what is on the CD,
7 I think that would be appropriate.
8 MR. LEWIS: And I also would if this is
9 coming in like to suggest to the Board a follow-up
10 question at some point to put this in perspective.
11 JUDGE ABRAMSON: Yes, that's fine. Let me
12 follow up.
13 CHAIR YOUNG: I think we need to wrap up
14 on all of this.
15 JUDGE ABRAMSON: Well, we will do each
16 point.
17 CHAIR YOUNG: So there will be several.
18 There will be several.
19 JUDGE ABRAMSON: Mr. Gundersen, what we
20 are hearing now from the applicant is that this was
21 degraded pipe that was replaced. And you have heard
22 their description of the pipe and their assertion that
23 there is no reason to believe that the external pipe
24 doesn't satisfy the current licensing basis. If the
25 pipe satisfied the current licensing basis, would you

1 be concerned about this potential failure that could
2 block both loops on the outlet pipe?
3 MR. GUNDERSEN: If -- I think there is --
4 if the pipe satisfied its current licensing basis for
5 the 60 years of the plant's life, there would be no
6 need for an aging management program and I would have
7 no concerns.
8 The fact of this matter is, though, that
9 their own -- and, frankly, it was wonderful that they
10 did both a visual inspection from the inside and an
11 ultrasonic inspection -- I think that has been
12 acknowledged this morning -- from the inside, both of
13 which I have been advocating for as part of the
14 overall aging management plan, as opposed to just
15 opportunistic looks at the outside.
16 So I think that if we had a commitment to
17 -- and not every ten years, but if we had a commitment
18 to do a volumetric inspection of the pipe and a visual
19 inspection of the pipe -- this is a large pipe.
20 You can crawl in this pipe. Then that
21 would be a much better piece of an overall inspection
22 program to make sure that the pipe remains within its
23 current licensing basis.
24 JUDGE ABRAMSON: Okay. Now, we have been
25 discussing -- and there is a lot of testimony in the

1 record about the buried pipe inspection program, which
2 looks at it from the outside. What we don't know is
3 what they are proposing to do on the internal
4 inspections as part of their ongoing operation and
5 maintenance procedure. So perhaps we should hear
6 that.
7 What is the plan of the applicant? What
8 would your ordinary ongoing operation and maintenance
9 programs tell you to do with these pipes?
10 MR. GUNDERSEN: For the very discharged
11 pipe with the new cured-in-place liners, we have got
12 a ten-year inspection frequency right now. When we
13 first put the liners in, we proposed a 10 or a 20-year
14 frequency. We have gone with a ten-year frequency
15 just to verify and assure that there are no changes in
16 the cured-in-place liner.
17 JUDGE ABRAMSON: So they went in in '03.
18 And when would your next -- the latest one went in in
19 --
20 MR. GUNDERSEN: Two thousand and one and
21 2003. So it would be 2011 and 2013.
22 JUDGE ABRAMSON: So we're talking about
23 four or five years from now. This is before the
24 license extension actually commences. Is that
25 correct?

1 MR. GUNDERSEN: One will be.

2 JUDGE ABRAMSON: One would be before, and
3 one would be after. And what would the licensee do if
4 at that point your inspection indicated that there was
5 beginning to be failure, there was some degradation of
6 the cured-in-place liner?

7 MR. SULLIVAN: As demonstrated by what we
8 did when we found degradation in the rubber lining, we
9 would do the inspections that were necessary to be
10 done to ensure that we meet our current licensing
11 basis.

12 We would write a condition report, enter
13 into our corrective action program, and we would
14 disposition it to ensure that the system continues to
15 meet its safety function.

16 JUDGE ABRAMSON: Staff, what would be the
17 staff's response to this condition report that
18 indicates that they are beginning to see some
19 degradation? Would you then iterate with the licensee
20 on what was the proper procedure going forward or how
21 would that work?

22 MR. CHAN: I am Terrence Chan.

23 We would not iterate with the licensee
24 with respect to this non-conformance. They would
25 themselves analyze the situation and determine by

1 their own analyses as to what is the appropriate
2 reinspection frequency to ensure that all regulatory
3 requirements are met.
4 JUDGE ABRAMSON: And you would not verify
5 that? You would just take it in and file it
6 somewhere?
7 MR. CHAN: No. Our inspectors would
8 review those condition reports.
9 JUDGE ABRAMSON: And what do the
10 inspectors -- what is their responses? They review it
11 and put it in a file or do they do something with it?
12 MR. CHAN: I am not an inspector. So I
13 can't speak to what the inspectors would say or what
14 they would do with it, but they would evaluate the
15 adequacy of the corrective action that was taken. They
16 would -- from what I have seen, they validate or --
17 excuse me -- they verify that the analyses and the
18 evaluations have been conducted properly. And they
19 would if there were any questions raised regarding the
20 actions that the licensee took, this is part of -- all
21 of this is part of the ongoing operation and
22 maintenance and the agency's oversight. Is that
23 correct?
24 DR. DAVIS: Yes. Every condition report
25 has a cursory review by the resident inspectors. They

1 look at every single one. And then the region comes
2 in on a periodic basis. And they select certain
3 condition reports, and they do a thorough
4 investigation of those. That's part of our looking at
5 the appendix B quality assurance program.
6 So not all condition reports are reported
7 to the NRC, only certain ones. And they have to
8 exceed a threshold before they are reported to the
9 NRC.
10 CHAIR YOUNG: To the regional inspector or
11 --
12 DR. DAVIS: Or to the headquarters. If
13 they meet a certain threshold, then they have to be
14 reported on the licensee of that report.
15 JUDGE COLE: But they are all seen by the
16 inspector on site?
17 DR. DAVIS: Yes.
18 CHAIR YOUNG: Okay. That is what I was
19 trying to clarify, that they do a condition report,
20 the applicant does a condition report, no matter what.
21 The resident inspector would see all of those.
22 DR. DAVIS: Yes.
23 CHAIR YOUNG: Not all of those would
24 necessarily be forwarded to the office. What's the
25 name of the office that they would come to that sounds

1 --

2 JUDGE ABRAMSON: NRR.

3 DR. DAVIS: NRR, yes.

4 CHAIR YOUNG: NRR. Not all of them would

5 be forwarded to NRR.

6 DR. DAVIS: That's correct.

7 CHAIR YOUNG: That is what you are saying?

8 DR. DAVIS: That's correct.

9 JUDGE COLE: And we are talking about the

10 NRC inspector on site?

11 DR. DAVIS: Yes.

12 CHAIR YOUNG: I would like to just clarify

13 something at this point about the periodic

14 inspections. But first, even more simple

15 clarification, the rubber liner that you are referring

16 to -- I want to see if I understand this -- the

17 original pipes had a rubber liner, correct?

18 MR. SULLIVAN: That's correct.

19 CHAIR YOUNG: And that rubber liner, was

20 that something that was a separate piece put inside

21 the pipe or was that something that was applied and

22 then somehow cured or allowed to --

23 MR. SULLIVAN: The original rubber lining

24 was applied as part of the manufacturing process for

25 the pipe. So we receive it with a pipe with a rubber

1 liner.

2 CHAIR YOUNG: Okay. But it's something

3 that's applied to the inside of the pipe? It's not a

4 separate piece?

5 MR. SULLIVAN: That's correct.

6 CHAIR YOUNG: So that it adheres to the

7 inside of the pipe?

8 MR. SULLIVAN: That's correct.

9 CHAIR YOUNG: And then you say later you

10 added on an additional coating over all of the

11 interior of the pipe or just part of it?

12 MR. SULLIVAN: Yes, over the entire run of

13 the discharge piping. And that was because the rubber

14 lining was nearing end of life. And based on our

15 inspections that we had been performing, we knew that

16 we had to -- we had to deal with the degradation of

17 the rubber lining.

18 CHAIR YOUNG: Okay. So the original pipes

19 with the rubber liner, that was at the -- when the

20 plant was built?

21 MR. SULLIVAN: That's correct.

22 CHAIR YOUNG: And then the additional

23 application was done when again?

24 MR. SULLIVAN: The cured-in-place --

25 CHAIR YOUNG: Cured-in-place.

1 MR. SULLIVAN: -- pipe liner was done in
2 2001 and 2003 on one of the loops in '01 and the other
3 loop in '03.
4 CHAIR YOUNG: Right. Okay. Thank you.
5 That clarified that basic information.
6 The other question I have is -- and if you
7 could help me understand it? I would also like to
8 hear from the staff and the intervenor's experts as
9 well. If the periodic inspection is every ten years
10 and, as I understand it, as one of those periodic
11 inspections, it was discovered that there was some
12 indication of the liner wearing away or whatever the
13 correct term is and then you looked at it again two
14 years later and it might have been a little worse, but
15 it wasn't bad enough to do anything about it at that
16 point. And then two more years later, you found that
17 it actually had gone through to the metal of the pipe,
18 and you replaced that part.
19 The question that comes to my mind and
20 that I would like to get some clarification on is if
21 that could occur in a space of six years, what
22 assurance do you have that you would catch anything
23 like that in ten years? Would it be possible that
24 some level of degradation could start occurring in
25 year one? And then if you add six years to that,

1 which is the progression that we talked about before
2 or, actually, only four years from the initial
3 discovery, how would you assure that it wouldn't be
4 possible that something could reach the level that you
5 discovered in 1999 before you did your next ten-year
6 inspection?
7 MR. SULLIVAN: The rubber lining has a
8 life of approximately 20 years. And when we began,
9 when we did the inspections, we found degradation. So
10 we increased the inspection frequency, and we looked
11 at --
12 CHAIR YOUNG: From what to what?
13 MR. SULLIVAN: Well, we started looking at
14 it every refueling outage, every two years. That's
15 for the rubber lining. The cured-in-place lining is,
16 as we discussed, an epoxy coating liner that has a
17 life expectancy of approximately 35 years.
18 And that system of pipe lining is used
19 extensively in industry. And by "industry," I mean
20 waste water systems, public water supply systems, et
21 cetera. So there's a fairly large experience base for
22 the use of that piping system, if you will.
23 We chose just because we don't have a lot
24 of experience with it at the power plant to --
25 CHAIR YOUNG: With?

1 MR. SULLIVAN: With pipe lining systems to
2 inspect it every ten years. And we believe that that
3 is a conservative, proactive inspection frequency so
4 that we can detect any degradation if it's occurring.
5 CHAIR YOUNG: Let me see again if I can
6 understand. Let me just follow this up. I would like
7 to get my understanding clear at least on what the
8 situation is.
9 So tell me if I am understanding this
10 correctly. You're saying that the degradation that
11 was discovered to be starting in '95 and that you left
12 in place in '97 and that you then replaced in '99,
13 that was to the rubber liner.
14 And so you're saying that the assurance
15 that you have that a similar degradation happening
16 over that space of time would not occur because, in
17 addition to the rubber liner, now there is this epoxy
18 coating.
19 And just to see if I understand, the epoxy
20 coating is on top of the rubber liner. And then it's?
21 How is it cured? Does it become bonded with the
22 rubber liner? How does that work?
23 And basically so I am asking two
24 questions. One, how does that work? And, two, is
25 your answer about the assurance based on the

1 experience with the epoxy, suggesting that the epoxy
2 would not degrade as quickly once something is started
3 as the rubber would? Does that make sense?
4 MR. SULLIVAN: It makes sense. Let me
5 describe how the liner was put in. And, Steve, I am
6 going to need you to speak to the bonding aspects of
7 it. The liner looked like a big sock, if you will,
8 when you --
9 CHAIR YOUNG: The rubber?
10 MR. SULLIVAN: No, no. The epoxy lining.
11 I'm sorry.
12 CHAIR YOUNG: Say whichever one you're
13 talking about so I --
14 MR. SULLIVAN: Yes. I will.
15 CHAIR YOUNG: Thanks.
16 MR. SULLIVAN: The epoxy liner system
17 looks like a big sock. And that is taken, and it's
18 dipped in the epoxy solution. It's pulled through the
19 piping. And the piping lengths are 240 feet and 225
20 feet if I recall the numbers correctly. It's pulled
21 through the piping, that length of piping.
22 So what was the carbon steel rubber-lined
23 piping now has this sock pulled through it. It's
24 impregnated with epoxy. That sock is then filled with
25 hot water, and it's pressurized. And it's left there

1 to cure for a period of time and --

2 CHAIR YOUNG: How long?

3 MR. WOODS: A number of hours.

4 CHAIR YOUNG: A number of hours.

5 MR. SULLIVAN: I'm not sure. A number of

6 hours.

7 CHAIR YOUNG: And how thick is the epoxy

8 sock that you called that?

9 MR. WOODS: Normally a half an inch.

10 CHAIR YOUNG: Okay. Go ahead.

11 MR. SULLIVAN: That is left there for the

12 -- to cure in place. And then the water is drained

13 out. And then the ends are trimmed back around the

14 ends of the rubber-lined piping.

15 So now what was a 240-foot length of pipe

16 or 225-foot length of pipe that was, you know, carbon

17 steel with a rubber liner now has this impregnated

18 sock or cured-in-place liner inside the pipe as well.

19 CHAIR YOUNG: And that's done while it's

20 underground?

21 MR. SULLIVAN: That's done while it's

22 underground. That's correct.

23 CHAIR YOUNG: And then you were going to

24 talk to the bonding, Mr. Woods?

25 MR. WOODS: During the inversion process

1 and filling it with water and pressurizing it, that --

2 CHAIR YOUNG: When you say "the inversion

3 process," what do you mean by --

4 MR. WOODS: Well, as part of the -- as the

5 sock is inserted into the pipe, the -- you use water.

6 As you pump it in, it actually draws the sock down.

7 And it inverts it so that you have the wetted surface

8 going against the rubber liner.

9 CHAIR YOUNG: The wet --

10 MR. WOODS: The wetted felt with epoxy.

11 CHAIR YOUNG: And so it's -- okay. Okay.

12 MR. WOODS: So that wet epoxy is actually

13 up against, tight up against, the rubber liner. So

14 when the entire piping is filled with water to cure,

15 you assure you have got a good, tight seal between the

16 epoxy liner and the rubber liner, the existing rubber

17 liner.

18 CHAIR YOUNG: The word you were using was

19 "wet." It was wet. So it sticks. Did I understand

20 that right?

21 MR. WOODS: Yes. The epoxy is wet. It is

22 in a liquid form when it is impregnated into the felt.

23 And then as it cures, it turns in toward a hard

24 composite.

25 CHAIR YOUNG: And sticks to the rubber, --

1 MR. WOODS: Yes. I'm not sure what the --

2 CHAIR YOUNG: -- to use a layman's term?

3 MR. WOODS: Yes.

4 CHAIR YOUNG: Okay. Go ahead. Any

5 further clarification? And I appreciate your helping

6 me understand this.

7 MR. SPATARO: Yes. As a practical

8 example, let's say you took one of your socks and you

9 dipped it in honey and the sock was -- you pulled the

10 toe back towards your hand and then dipped the whole

11 thing in honey. Then you placed this inside a glass

12 and then took your hand and pushed the inside of your

13 sock, which was dry, and kept pushing it until the

14 entire sock was through to the bottom of the glass.

15 CHAIR YOUNG: Okay.

16 MR. SPATARO: That is exactly what

17 happens. And then you turned --

18 CHAIR YOUNG: That is inversion.

19 MR. SPATARO: Then you fill the -- yes,

20 that's right. That's the inversion process. Then you

21 fill it with hot water. You let it sit. And the hot

22 water cures the honey, as it were, but it also bonds

23 to the rubber, the existing rubber. And that is

24 basically the process.

25 CHAIR YOUNG: Thank you very much.

1 Any follow-up from the staff or intervenor
2 on that, just those questions about the process and
3 the time period that I had asked about?
4 JUDGE COLE: Could I make a comment here
5 or a question? The original rubber liner was
6 installed at the time the plant started operation. Is
7 that correct?
8 MR. SULLIVAN: That is correct.
9 JUDGE COLE: And that was pre-1972,
10 possibly maybe two years before you started operating?
11 MR. SULLIVAN: That is correct.
12 JUDGE COLE: So that by the time you found
13 a problem, that was 1995? And that was 23 years after
14 the liner, rubber liner, the pipe with the rubber
15 liner, was installed?
16 MR. SULLIVAN: That is correct.
17 JUDGE COLE: Are you satisfied with that
18 time life of the rubber liner?
19 JUDGE ABRAMSON: Was that consistent with
20 what you expected for the life?
21 MR. SULLIVAN: That is actually better
22 than what we expected and because it was greater than
23 the 20-year lifetime.
24 JUDGE COLE: So that in 1999, you replaced
25 2 40-foot sections. And then were they installed with

1 a rubber liner or with some other material?

2 MR. SULLIVAN: They were installed with a

3 rubber liner.

4 JUDGE COLE: Okay. Then in 2001 and 2003

5 -- did you want to add something?

6 MR. SULLIVAN: Excuse me.

7 MR. WOODS: The 40-foot spools that were

8 replaced, instead of the --

9 CHAIR YOUNG: When you say, "spools," you

10 mean pipes?

11 MR. WOODS: I'm sorry. Pipe sections.

12 CHAIR YOUNG: Pipe sections. Okay.

13 MR. WOODS: They were epoxy-coated, both

14 interior and exterior.

15 JUDGE COLE: Okay.

16 MR. WOODS: A rubber liner was not reused

17 on that. An epoxy was used both the internal surface

18 and the external surface.

19 JUDGE COLE: So when you then resurfaced

20 the inside of the pipes in 2001 for one of the legs

21 and 2003 for the other leg, you covered the entire

22 inside of the pipe with this new cured-in-place epoxy

23 lining?

24 MR. WOODS: That's correct.

25 JUDGE COLE: All right, sir. Thank you.

1 JUDGE ABRAMSON: Let me just -- well, does
2 staff or intervenor have any comment on this specific
3 series of questions about how this was done and what's
4 done?
5 DR. DAVIS: The ten-year interval seems
6 reasonable to the staff. And if they do find any
7 problems, then that is going to trigger a condition
8 report. And it's going to -- they will then increase
9 the frequency of events.
10 JUDGE ABRAMSON: And the first inspection
11 will be before the commencement of the license
12 extension period. The second one is right after. Is
13 that correct?
14 DR. DAVIS: That is correct.
15 JUDGE ABRAMSON: Assuming the license
16 extension is granted in 12?
17 DR. DAVIS: But the quality assurance
18 program is in place to ensure that if they find
19 something wrong, that they will follow up on it.
20 JUDGE ABRAMSON: Mr. Gundersen, any
21 comment on this particular --
22 MR. GUNDERSEN: Just three, I think quick.
23 First off, I am pleased that there is a commitment to
24 a visual and/or volumetric inspection from the inside.
25 My problem is the ten-year interval. And I think Judge

1 Young brought up my problem. If a problem can occur
2 over a four-year period, then a ten-year interval is
3 going to allow the problem to become significant.
4 So I advocate for more frequent
5 inspections of the type that they did. But the
6 frequency in light of the testimony seems to me to be
7 a little bit short.
8 CHAIR YOUNG: Short?
9 MR. GUNDERSEN: I'm sorry. Yeah. A
10 little bit long. And I think in my testimony I
11 suggested a more frequent testing schedule.
12 The other thing is that this
13 cured-in-place sock, honey sock, is applied to a
14 coating which under testimony here today is at the end
15 of its useful life.
16 So my -- you know, there's -- this is not
17 a -- I'm not aware of a manufacturer's guarantee that
18 this is a 35-year process. This is done in the field
19 by qualified tradesmen. And you run into field
20 problems.
21 So, again, I think that, given it's in the
22 field applied on top of a liner which is at the end of
23 its useful life, that a more frequent volumetric and
24 visual inspection would be appropriate.
25 JUDGE ABRAMSON: Let me ask you --

1 MR. GUNDERSEN: There is indications in
2 that liner before the sock was pulled that there were
3 other problems. Now --
4 JUDGE COLE: You are talking about the
5 rubber liner?
6 MR. GUNDERSEN: Yes, which is now covered.
7 JUDGE ABRAMSON: Let's assume --
8 CHAIR YOUNG: Can I just get a
9 clarification. What do you mean by "volumetric
10 testing," just to clarify for me.
11 MR. GUNDERSEN: They suggested that they
12 had done ultrasonic testing, which is sending a sound
13 beam in and bouncing it back in portions of the pipe.
14 CHAIR YOUNG: So that's what you mean by
15 --
16 MR. GUNDERSEN: Yes, yes, yes.
17 CHAIR YOUNG: Okay. That's all.
18 MR. GUNDERSEN: And the visual, of course,
19 is --
20 CHAIR YOUNG: Right.
21 MR. GUNDERSEN: -- either with cameras or
22 eyeballs.
23 JUDGE ABRAMSON: Let's assume for a moment
24 just so we can discuss this rationally that the rubber
25 liner is just there and isn't providing any

1 protection, what we now have is a pipe with an
2 epoxy-impregnated fiber liner that is bonded to the
3 rubber, that is bonded to the pipe. So you may have
4 a gap, but you have this epoxy.
5 Do you have any experience with these
6 kinds of epoxy liners?
7 MR. GUNDERSEN: No, I do not any
8 experience with this type of epoxy liner. I would
9 disagree that the old liner is still bonded. I mean,
10 there's --
11 JUDGE ABRAMSON: Okay. But let's assume
12 it's totally ineffective. What I am interested in is
13 the applicant's proposed -- and let's remember this is
14 part of its ongoing operation and maintenance program,
15 not part of its aging management program.
16 And this is the reason we are in this odd
17 circumstance here, because in order for them to get
18 the license extension, they are required to
19 demonstrate a sufficient aging management program.
20 And the aging management program has to focus -- is
21 only focused upon components or structures whose
22 failure to perform their function would make them
23 unable to handle one of these very severe accidents
24 that's set out in our regulations as the requirements.
25 It doesn't require them to do anything about their

1 ongoing maintenance because that's handled by another
2 part of the agency under other regulations.
3 But the questions that you all raised
4 require at least that we understand how these two sets
5 of programs interact because you are suggesting that
6 their ongoing operations and maintenance programs
7 should have more frequent inspections in order to
8 assure that's exactly what Mr. Gundersen suggested,
9 that the inspection program be more frequent.
10 MR. GUNDERSEN: I am suggesting that as
11 part of their aging management, that they look at the
12 inside of the pipe as well as the outside of the pipe.
13 JUDGE ABRAMSON: Okay.
14 MR. GUNDERSEN: But not that it's ongoing.
15 It should be a commitment as part of the ongoing into
16 the future, commitment into the future to extend the
17 life of this plant.
18 CHAIR YOUNG: Actually, give her the
19 microphone if she is saying anything so it can be on
20 the record.
21 MS. LAMPERT: Be patient, please. Our
22 contention has been all along that the aging
23 management program itself is insufficient and has to
24 be supplemented with more frequent inspections. That
25 is what we have been talking about.

1 We are not saying that the maintenance
2 program has to be beefed up. We are saying you have
3 to require supplements to more frequent inspections
4 and monitoring wells to detect that leaks do not grow
5 so big to interfere with the safety functions. We do
6 not assume that aging is gradual so that small leaks
7 will go --
8 JUDGE ABRAMSON: We've heard that. Can we
9 move on?
10 MS. LAMPERT: Okay. But I was clarifying
11 because you see to be boxing us into where we were
12 not.
13 JUDGE ABRAMSON: I understand your
14 clarification.
15 Mr. Gundersen, once more, for the record,
16 do you have any experience with epoxy coatings of this
17 nature?
18 MR. GUNDERSEN: No, I do not.
19 JUDGE ABRAMSON: Thank you.
20 Back to the staff for a moment. Is this
21 sort of epoxy coating in common use in the industry?
22 We'll get there. We'll get there.
23 DR. DAVIS: There are a number of
24 different kinds used in service water. This
25 particular one I'm not aware if it's used anywhere

1 else, but it's almost like creating a ship hull inside
2 of the --
3 CHAIR YOUNG: Could you speak up a little
4 bit and also say creating a what?
5 DR. DAVIS: Of the hull of a boat, a ship.
6 It's a very similar process.
7 CHAIR YOUNG: Ship hull? Okay.
8 DR. DAVIS: Yes, a hull. So it's a much
9 better coating than the rubber lining. The rubber
10 lining will oxidize with time and will degrade.
11 JUDGE ABRAMSON: And the epoxy?
12 DR. DAVIS: The epoxies are much more
13 resistant.
14 JUDGE ABRAMSON: So when the applicant
15 says that the useful life of this epoxy coating is
16 something like 35 years, is that consistent with your
17 understanding of these?
18 DR. DAVIS: Yes. And a frequency of ten
19 years of inspection seems very reasonable. But I
20 would like to add that a volumetric examination of
21 this system is not currently possible.
22 JUDGE ABRAMSON: Because?
23 DR. DAVIS: Because you're going through
24 -- try to go through three layers with a UT probe.
25 And it's just not going to know what to do with the

1 interface between the different layers. And it's
2 going to be just -- at this point a UT technique has
3 not been developed that would be --
4 CHAIR YOUNG: Ultrasonic testing
5 technique?
6 DR. DAVIS: Ultrasonic test technique.
7 JUDGE ABRAMSON: So, if I understand you
8 correctly, ultrasonic testing would not yield any
9 useful information. So what would the staff think is
10 appropriate: Visual inspection of the liner?
11 DR. DAVIS: Yes, visual inspection.
12 JUDGE ABRAMSON: Let's come back to what
13 is really underlying all of this. This is not
14 relevant for small leaks. This is only relevant for
15 degradation of this pipe that carries service water
16 back to the ocean so great that it is in danger of
17 structural failure if a design basis earthquake
18 happens and, thus, the one at least that Mr. Gundersen
19 is proposing.
20 The holes that you found and the 40-foot
21 section that you replaced, which were the worst
22 degraded portions of the pipe in the middle 1990s,
23 were any of those portions of those pipes degraded to
24 the point where a structural analysis would indicate
25 it could not withstand a design basis earthquake or

1 was that analysis done or not done?

2 MR. WOODS: I don't believe that an

3 analysis was done on the failed -- on the through-hole

4 leak on that pipe. In my opinion, no, I don't see

5 where that could lead to a catastrophic failure of the

6 entire piping section.

7 JUDGE ABRAMSON: This was a hole about the

8 diameter of a quarter, two holes adjacent to each

9 other, which might in the total add up to three or

10 four quarters worth judging from the picture, in a

11 pipe whose inside diameter is 21 inches, 21-plus

12 inches.

13 So we've got something this big around

14 with a hole like that on it. And we're talking about

15 compressive failure that would cause that to collapse

16 and choke the flow off.

17 What is the staff's view of this? Was

18 this level of degradation, could this level of

19 degradation have endangered the ability of the pipe to

20 meet the current licensing basis vis-a-vis design

21 basis events?

22 MR. CHAN: In my judgment, that could not

23 happen. That would not happen, --

24 JUDGE ABRAMSON: So this --

25 MR. CHAN: -- especially if you consider

1 single failure and failure of the other train as well.
2 That is extremely, extremely unlikely.
3 JUDGE ABRAMSON: And when you replaced the
4 2 40-foot sections, was there any through-hole damage
5 to the other -- this was in one loop. What about the
6 other loop?
7 MR. WOODS: There was no through-wall
8 degradation in the other loop.
9 JUDGE ABRAMSON: Was there degradation at
10 all?
11 MR. WOODS: There was some degradation
12 from min. wall. So it was easy just to replace that
13 section of pipe.
14 CHAIR YOUNG: Minimal walls. There was
15 some degradation from minimum?
16 MR. WOODS: From minimum wall. That's
17 correct.
18 CHAIR YOUNG: Explain what you mean by
19 saying that.
20 MR. WOODS: Wall thinning.
21 CHAIR YOUNG: Wall thinning of the actual
22 metal?
23 MR. WOODS: Of the metal because the
24 rubber liner was torn away.
25 JUDGE COLE: This sock liner is placed in

1 the entire length of the pipe on each of the two
2 loops, correct?
3 MR. WOODS: Yes.
4 JUDGE COLE: And you say it is bound to
5 the pipe. What is the probability of that coming
6 loose at one end and then just blocking up the whole
7 pipe with the sock?
8 MR. SPATARO: The way in which the epoxy
9 liner is applied dictates that, first of all, you
10 examine the remaining rubber lining for integrity.
11 Now, it doesn't mean that the liner is failing or has
12 failed completely. It simply means that the liner has
13 degraded but is still useful. Otherwise the liner
14 should be taken out. That surface is then prepared by
15 scraping --
16 CHAIR YOUNG: Could I interrupt?
17 MR. SPATARO: Yes.
18 CHAIR YOUNG: You say the rubber liner is
19 examined before you put the epoxy coating in or the --
20 MR. SPATARO: That's correct.
21 CHAIR YOUNG: How is that examination
22 done?
23 MR. SPATARO: Okay. There are two ways to
24 do that. One is to do a visual examination of the
25 surface because any aging effect that is going to

1 happen to the rubber lining is going to be evidenced
2 on the surface and work its way down.
3 CHAIR YOUNG: And how is the visual
4 examination done?
5 MR. SPATARO: Well, a number of ways. I
6 was not involved in the actual inspection. Brian, do
7 we know how they inspected the liner?
8 MR. WOODS: I believe the inspection was
9 done -- a crawler was sent down with a video camera.
10 And also portions of it, an actual person went into
11 the pipe.
12 MR. SULLIVAN: A slim fellow.
13 MR. WOODS: Yes.
14 CHAIR YOUNG: A crawler is a machine or a
15 slim fellow?
16 (Laughter.)
17 MR. WOODS: Both.
18 MR. SPATARO: When the integrity of the
19 rubber liner is assured, the surface is then prepared
20 by either scraping or what we call scarfing, where you
21 remove any debris or form formations of any kind of
22 marine growth or anything that might be on the surface
23 of the pipe. You take that all off.
24 CHAIR YOUNG: Let me back up again. I'm
25 sorry, but I do want to understand. One of the things

1 that was raised was the possibility of the rubber
2 coming away from the metal. When the visual
3 inspection is done, how would you determine whether
4 the connection between the rubber liner and the metal
5 pipe was still -- that it still adhered?
6 CHAIR YOUNG:
7 MR. SPATARO: Okay. the way that you
8 determine that is you look at the contour of the
9 surface itself. If delamination had occurred, the
10 rubber lining would have started to belly into the
11 pipe, and it would be readily seen.
12 Another way to do that, too, is as you are
13 crawling down the pipe, you just simply press some
14 sort of -- any kind of instrument you want -- it could
15 be simply a pencil if you wish -- against the liner
16 itself. There should be some little bit of give. If
17 that liner has pulled away, you're really going to be
18 able to move it. So that gives you an indication of
19 any delamination that might be occurring.
20 Once that has been verified that the liner
21 is still intact --
22 CHAIR YOUNG: And you scrape off the --
23 MR. SPATARO: Yep. You scrape off
24 everything there. Now, the object of scarfing that
25 surface is to provide, number one, a roughened surface

1 for the epoxy to bond to. So it's a mechanical bond.
2 CHAIR YOUNG: So you do it for the whole
3 --
4 MR. SPATARO: The whole thing, absolutely,
5 from start to finish. Then the sock is inverted,
6 placed through the piping. And the action of curing
7 is such that there is a mechanical bond, a very, very
8 tight mechanical bond between the liquid epoxy to the
9 scarfed and abraded rubber. So that there is a strong
10 mechanical bond.
11 Now, bear in mind that all of this is
12 occurring in an outward pressure pattern so that when
13 it does cure, it is literally a pipe within a pipe.
14 And it is not going anywhere.
15 There is no way that it could suddenly
16 break off and a whole piece walk down the pipe because
17 the pipe is -- the two pieces are actually so tightly
18 bonded that they are not going to move. They are not
19 going to move in a lateral motion.
20 JUDGE ABRAMSON: Let me ask you a question
21 or two about the structure of this epoxy-impregnated
22 sock. Is this akin to the shell of a Corvette, where
23 there are fibers that are bonded together by epoxy?
24 The fibers provide some structural
25 integrity to the fiber, like rebar would with

1 concrete. And the epoxy, therefore, in combination
2 with this fibrous mat forms a relatively rigid shell.
3 Is that correct?
4 MR. SPATARO: You have got it. Generally,
5 though, with rebar and with the Corvette shell, you
6 are dealing with either fibers or a rod that is
7 surrounded by the epoxy resin. In this case, we have
8 a mat that is the entire length, the entire
9 circumference of the pipe. That is impregnated.
10 So you get both the value of the strength
11 of the fibers and the fact that it is literally a
12 complete system of fibers interwoven into this mat
13 that run the whole length of the pipe.
14 JUDGE ABRAMSON: So this becomes like a
15 relatively rigid fiberglass shell, if you will, except
16 that it's not fiberglass. It's a felt shell,
17 impregnated felt shell.
18 MR. SPATARO: Exactly, yes.
19 JUDGE ABRAMSON: So the scenario that Dr.
20 Cole was asking about, where a piece of this could
21 come loose and plug the entire pipe, would be a rather
22 remarkable event. Is that --
23 MR. COX: I think that is right. I will
24 let Bill answer that, but I did want to make one
25 clarification. The cured-in-place pipe, we have been

1 calling it cured-in-place pipe lining. The literature
2 actually refers to that as a cured-in-place pipe.
3 And it's actually analyzed to be able to
4 stand the pressure loads and the loads from outside
5 the hydraulic pressures of the water above it as if
6 there was no outside pipe. It's actually a pipe
7 within a pipe. It is rigid.
8 CHAIR YOUNG: So you are saying it is
9 analyzed separately from the metal pipe. It's
10 analyzed as a separate pipe that would need to
11 withstand pressures. What sort of pressures are you
12 talking about?
13 MR. COX: It is analyzed for the head of
14 water above it and the -- because the pipe runs
15 downhill, it actually draws a vacuum in parts of it.
16 So it's analyzed to a negative 11 pounds per square
17 inch from the outside, and it's analyzed to -- I can't
18 remember the -- whatever the design pressure is from
19 the inside.
20 But it is -- I mean, it's not -- we credit
21 both the metal and the pipe, but it does -- the pipe
22 does have its own separate analysis. The
23 cured-in-place pipe has a separate analysis. It says
24 it can withstand the normal pressure loads acting
25 within and from the outside.

1 CHAIR YOUNG: Since you have raised this,
2 let me just clarify another thing that I was wondering
3 about that has been raised. And that is the timing
4 again, going back to that.
5 It's been said -- well, the issue of
6 experience with epoxy coatings was raised, and then
7 also the timing was raised. I want to ask about those
8 two things since you have sort of brought up what kind
9 of expectations you have about the epoxy lining.
10 First of all, what experience do Entergy's
11 experts and the staff's experts have with this? And
12 what experience is out there, operating experience,
13 with this kind of epoxy coating? And in that context,
14 what knowledge is there about the progression of any
15 degradation once it occurs, how fast that could occur,
16 and also this bathtub curve phenomenon that has been
17 described?
18 So that is about four questions. Do I
19 need to go back with them separately?
20 MR. SPATARO: I will take it from the
21 metallurgical portion, and I will hand it back to Alan
22 for the rest. The epoxy materials that we are talking
23 about and this process have been on the market at
24 least 20 years, at least that long.
25 I have personally used it and seen it

1 used. And where it really has its benefit is if you
2 have a degraded piping system. In this instance, it
3 happened to be a firewater system that had degraded
4 and was very, very expensive to dig up. There was
5 concrete and buildings over it and parking lots, that
6 kind of thing.
7 What they did was send a pig through
8 there, which is just a machine that runs through the
9 pipe. And they literally machined out all the debris,
10 all the corrosion product and then examined the wall
11 thickness of the piping.
12 And this is firewater. So the wall
13 thickness and the pressures were not as great as what
14 we are talking about in the plant.
15 CHAIR YOUNG: So let me understand. You
16 are talking about a pipe that has this coating?
17 MR. SPATARO: No. This is just a pipe
18 that was buried in the ground as an example from my
19 experience.
20 CHAIR YOUNG: Without the coating. Okay.
21 MR. SPATARO: This liner was then run
22 through that pipe in order to make a pipe within a
23 pipe such that that pipe did not have to be dug up and
24 replaced. And this was approved by the national fire
25 protection code.

1 CHAIR YOUNG: So the metal pipe had
2 degradation --
3 MR. SPATARO: Exactly.
4 CHAIR YOUNG: -- the extent of holes or --
5 MR. SPATARO: Possibly, yes. Yes.
6 CHAIR YOUNG: And then the epoxy liner was
7 put in.
8 MR. SPATARO: Uh-huh.
9 CHAIR YOUNG: Go ahead.
10 MR. SPATARO: And met the code
11 requirements, the piping code requirements, for fire
12 protection, which essentially were that you should be
13 able to deliver the firewater from the tank to
14 wherever the sprinkler system is in whatever that
15 volume is that is required of you. And the liner
16 performed that function very well.
17 CHAIR YOUNG: And was there a time line on
18 that fire protection requirement that addressed how
19 long you would be able to rely on it?
20 MR. SPATARO: Not to my knowledge, no.
21 This was, as I say, some 20 years ago. However,
22 addressing the material itself, the experience with
23 the material shows that a life of at least 35 years is
24 expected of this.
25 Now, to address the ten-year inspection

1 interval that Entergy has chosen to perform here --

2 CHAIR YOUNG: And also the progression of

3 how fast.

4 MR. SPATARO: Uh-huh. The failure

5 mechanism of any of these types of epoxies is by

6 flaking. In other words, the surface itself dries out

7 over time. And that usually occurs more readily in a

8 volumetric airflow system or exposure to ultraviolet

9 radiation, neither of which exist.

10 CHAIR YOUNG: Volumetric airflow system.

11 What do you mean by --

12 MR. SPATARO: Volume of air flowing across

13 the surface so as to dry it out.

14 CHAIR YOUNG: Okay.

15 MR. SPATARO: Like blowing across your

16 hand, that type of thing.

17 CHAIR YOUNG: Okay.

18 MR. SPATARO: Neither one of those

19 situations exists here. So the general degradation

20 environment that cause epoxies to fail over time don't

21 exist.

22 CHAIR YOUNG: So you're saying the flaking

23 is caused by the drying out?

24 MR. SPATARO: Yes, which will occur either

25 by an airflow -- and hot air, of course, is more

1 damaging than cold air -- and by ultraviolet exposure.
2 CHAIR YOUNG: Is there experience with
3 what would cause degradation in a wet environment?
4 MR. SPATARO: Almost no degradation at
5 all.
6 CHAIR YOUNG: My question is --
7 MR. SPATARO: But if it was to degrade at
8 all, it would degrade by flaking.
9 CHAIR YOUNG: What is the experience of
10 how degradation would occur in a wet environment?
11 MR. SPATARO: There is very little
12 degradation that has been reported in a wet
13 environment, in a flowing water-type environment.
14 CHAIR YOUNG: And how widely is it used so
15 that -- I guess what I am trying to get at is, you are
16 saying there is little experience of degradation.
17 MR. SPATARO: Exactly.
18 CHAIR YOUNG: What is the context? How
19 much experience is there of using it over what periods
20 of time without the degradation?
21 MR. SPATARO: Well, the epoxy resins that
22 are used here have been in existence for -- oh, my God
23 -- 50 years.
24 CHAIR YOUNG: And you said 20 years --
25 MR. SPATARO: Twenty years that I -- my

1 experience in this type of application using the
2 fiberglass or the felt sock approach to that, to
3 lining a pipe.
4 CHAIR YOUNG: And a lot of power plants
5 used --
6 MR. SPATARO: I've seen it in power
7 plants, nuclear, hydro, and fossil. I have seen it in
8 waste water treatment facilities. Any place where
9 there is an aggressive environment, either you're
10 using city water or river water, lake water,
11 estuaries, the Bay, for instance, ocean water, any of
12 those types of things, this really, really holds up
13 well. And that is why it is used.
14 CHAIR YOUNG: And when it does occur, even
15 when it is wet, it would occur by some kind of
16 flaking?
17 MR. SPATARO: Flaking, yes. In other
18 words, the surface of the epoxy dries out. Now you
19 say, how can that happen in a wet environment?
20 Normally it doesn't. Okay? But generally you lose a
21 certain amount of the material, and it flakes off.
22 CHAIR YOUNG: Do you know of any
23 situations where it has degraded enough where there
24 could be a hole through to the metal and then --
25 MR. SPATARO: No.

1 CHAIR YOUNG: You don't know of any?

2 MR. SPATARO: No because in order for that
3 to happen, you would have to degrade by layers the
4 resin itself. Then you get to the mat. And you have
5 to somehow get through that mat. And that's
6 impregnated with the epoxy also. So the only way that
7 is going to happen again is by drying out.

8 The flow that is running through these
9 pipes should not have much of an effect on an epoxy
10 liner, which is a very dense, very smooth surfaced
11 material. So that there are very, very little
12 friction effects that would cause particles of the
13 thing to be scarfed off over time so that it would
14 wear out with the flow itself.

15 CHAIR YOUNG: Okay. Now, my memory may
16 not be right on this, but I think the one other thing
17 that I was wondering about was, once there was
18 degradation, what information and experience is there
19 about how fast that would then progress, either as a
20 function of having been started and then continuing to
21 degrade or as a function of age and being later on
22 down the line of its life, so to speak?

23 MR. SPATARO: Well, as this material would
24 degrade -- assume it's degrading. As it degrades, you
25 have this flaking that occurs. You then see a change

1 in the surface contour not being shiny anymore but
2 being undulated, having certain areas that are
3 slightly depressed that are no longer shiny.
4 The expectation is that this will probably
5 not occur for at least 35 years. But going in in ten
6 years will give you an idea of how it is holding up.
7 If there -- by any chance there were
8 degradation in between those ten-year inspections,
9 what would generally happen is that the epoxy would
10 flake off. But then the surface below it is fully
11 cured resin. That resin would have to go through the
12 same degradation mechanism.
13 So that in order for the failure to occur
14 from the time you notice it or don't notice it after
15 your last inspection, you have got to lose a certain
16 layer of the material. And this is not going to occur
17 over long, long lengths of it. It is going to occur
18 in certain small areas.
19 That has to go first. Then you have got
20 to dry out and degrade the next layer of material.
21 And this is we're talking mls here, thousandths of an
22 inch of degraded material coming off.
23 CHAIR YOUNG: And it is a half-inch thick.
24 MR. SPATARO: And then you've still got to
25 go all the way down. Then you've got to get through

1 the mat. That is not going to occur. That is going
2 to be something that is going to take an awfully long
3 time. And when I say, "awfully long," many years,
4 many, many years, only because of the way the material
5 is. It's a felt-type fibered material that is
6 impregnated with the epoxy. It's basically the --
7 CHAIR YOUNG: What is the material that
8 the felt is made of?
9 MR. SPATARO: We would have to get back to
10 you on that. My assumption is some sort of a
11 fiberglass because it has to be such a material that
12 would be able to absorb the epoxy resin in its liquid
13 form and hold it and then on curing be actually part
14 of the system itself.
15 CHAIR YOUNG: So, if I understand you
16 correctly, you are saying that the flaking would come
17 off, but then there would be the remaining epoxy
18 itself. And then you would get down to the felt,
19 which would have a greater durability than the epoxy
20 itself.
21 MR. SPATARO: Precisely.
22 CHAIR YOUNG: And the total thickness of
23 it is about a half an inch. And when the flaking
24 comes off and you see the undulation that you are
25 talking about, do you know what thickness that would

1 involve?

2 MR. SPATARO: Sure, only a few

3 thousandths.

4 CHAIR YOUNG: Okay. And then once

5 something progressed, what experience or knowledge do

6 you have on how fast -- I mean, once something has

7 degraded how fast the degradation would progress and

8 how much difference there would be in that earlier or

9 middle aged, as opposed to near the end of its life?

10 MR. SPATARO: Sure. A lot of that, all of

11 it, actually, depends on the environment, what is

12 actually causing the degradation. In this instance,

13 there is nothing that I can think of that would cause

14 the degradation.

15 We're speaking hypothetically, should the

16 degradation occur. One has to look at why the resin

17 is degrading. There's nothing that I know of in a

18 water environment that would cause the epoxy to

19 degrade.

20 Given that we're going to make that

21 hypothetical a judgment, -- okay? -- let's say I lose

22 ten mls in three, four years. Then I would have to

23 lose at least 30 mls in 9 years to get down to --

24 CHAIR YOUNG: Mls, millimeters?

25 MR. SPATARO: Yes. No, not millimeters.

1 Thousandths of an inch.

2 CHAIR YOUNG: Okay.

3 MR. SPATARO: So nine thousandths of an

4 inch would have to be lost by the next ten-year -- and

5 the next ten-year inspection, of course, would show

6 that. We would go in and repair it. So we would be

7 back to square one.

8 Given that that happened and we still had

9 some time to go, you still have the mat in place,

10 which given a rough estimate on my experience would

11 take -- oh, good God -- at least ten years, if not

12 more, to degrade simply because of what it is, the

13 material that it's made of.

14 There is nothing there that really is

15 going to degrade the felt itself or the fiberglass.

16 We're talking only about the resin itself degrading so

17 that when you got to the felt, you're literally

18 saying, "Well, I'm expecting the resin that's

19 impregnated in the felt to degrade." That's perhaps

20 not the same degradation mechanism as the thickness of

21 the resin that was above that felt or that, you know,

22 actually encapsulates that.

23 So you run into a whole different set of

24 failure mechanism here that is going to be very, very

25 slow, of the order of decades probably before that

1 felt would really go.

2 CHAIR YOUNG: Thank you very much. I

3 appreciate your clarification.

4 MR. SPATARO: You're welcome.

5 CHAIR YOUNG: Let me just ask one last

6 question on this line. And maybe it should go to the

7 NRC, although if Entergy experts know the answer, that

8 would be fine. And that is, is there any experience,

9 is there any knowledge in the field of any degradation

10 or events or anything that has actually caused any

11 degradation or break or holes in this epoxy liner?

12 DR. DAVIS: I don't have any experience

13 with this type of coating in the field. I know there

14 have been other linings that have failed, but it was

15 usually for mechanical reasons.

16 CHAIR YOUNG: Being something in it that

17 hit it or something, the pipe was broken from the

18 outside or --

19 DR. DAVIS: The liner was inserted into a

20 service water line. And it was actually too long. And

21 when they folded the flanges up, the broke the lining.

22 It was just a measurement error.

23 CHAIR YOUNG: So anyone else know of any

24 experience on that from other plants? There are these

25 reports that come out letting plants know about

1 experience that may have occurred at one plant, for
2 example.
3 MR. COX: As part of doing the license
4 renewal application, we looked at the industry
5 experience in a lot of areas of aging degradation.
6 And I don't recall finding anything that related to a
7 failure of this type of lining.
8 I believe we have this type of lining in
9 some of our other plants within the system. I am from
10 Arkansas nuclear 1. I believe we used that in the
11 service water system. I've not heard of any failures
12 or any significant degradation of this type of
13 cured-in-place lining.
14 CHAIR YOUNG: What plant did you say?
15 MR. COX: Arkansas nuclear 1.
16 CHAIR YOUNG: Okay. Thank you. Thank you
17 very much.
18 MR. SULLIVAN: Let me just add that the
19 INPO, the Institute of Nuclear Power Operations, does
20 conduct --
21 CHAIR YOUNG: Right.
22 MR. SULLIVAN: -- an operating experience
23 program.
24 CHAIR YOUNG: Right.
25 MR. SULLIVAN: And if there were any

1 operating experience in a nuclear power plant with
2 this type of material failing, we would be notified of
3 it. We would enter it into our corrective action
4 process and take corrective actions.
5 CHAIR YOUNG: And the industry has used
6 this type of liner for the 20 -- how long has the
7 industry used it?
8 MR. SPATARO: My experience was with
9 Indian Point 3. So I can go back at least 20 years on
10 a nuclear plant and say yes, we have used it.
11 CHAIR YOUNG: Okay.
12 MR. SPATARO: And, by the way, no reported
13 failure of that particular application to this date.
14 CHAIR YOUNG: Okay. Any follow-up on
15 that?
16 JUDGE ABRAMSON: I want to come back on
17 the other one. And I want to talk to Mr. Gundersen a
18 little bit, too.
19 CHAIR YOUNG: We'll get back to you on
20 this one.
21 JUDGE ABRAMSON: So let me come back.
22 This is all very interesting information about how the
23 liner is put in and how it might fail, but the issue
24 in front of us is what can cause this pipe to fail to
25 meet its intended safety function when it's redundant.

1 MS. LAMPERT: Excuse me, Judge. I
2 understood that both sides could respond. So there
3 were questions asked to Entergy and NRC. And it seems
4 like the democratic debates, that we haven't had a
5 chance --
6 CHAIR YOUNG: I'll make sure you get the
7 opportunity.
8 MS. LAMPERT: -- to respond --
9 CHAIR YOUNG: I'll make --
10 MS. LAMPERT: -- to those specific
11 questions that he asked.
12 JUDGE ABRAMSON: We will ask your expert
13 if you'll just let me follow up, please.
14 CHAIR YOUNG: We will get to you.
15 JUDGE ABRAMSON: Mr. Gundersen, we have
16 heard from the applicant that this size hole in their
17 opinion, they cannot think of a way that the size of
18 hole that they found in a 40-foot pipe they took out
19 could have led to catastrophic failure.
20 In your testimony, you said that these
21 holes can act as stress risers and increase the
22 likelihood of gross failure under the stress of
23 accident conditions. How much stress would be added
24 to this 20-inch internal diameter, three-eighth-inch
25 thick steel pipe by the kinds of holes that we have

1 seen in these pictures, a couple of quarter-size
2 holes?
3 MR. GUNDERSEN: I don't think that picture
4 is the greatest picture in the world. It indicates
5 between the holes wall thinning as well.
6 JUDGE ABRAMSON: Okay.
7 MR. GUNDERSEN: So, I mean, you are
8 talking about something --
9 JUDGE ABRAMSON: So let's say it was a
10 four-inch-diameter hole. How much would that increase
11 the local stressors or what would that do to the
12 probability of this pipe being unable to withstand a
13 design basis earthquake, which is the worst case
14 scenario you are painting, I think? Is that correct?
15 MR. GUNDERSEN: I believe a defect of that
16 size in that pipe, if there were a design basis event
17 could cause a pipe to collapse.
18 JUDGE ABRAMSON: And what analysis have
19 you done to support that belief or what analysis have
20 you seen to support that belief?
21 MR. GUNDERSEN: I think when the crack was
22 detected, the burden was on the licensee to actually
23 analyze that. And they didn't.
24 JUDGE ABRAMSON: That's not my question.
25 MR. GUNDERSEN: That's on the record. So

1 I have not run a supercomputer model, and I don't --

2 JUDGE ABRAMSON: Have you ever seen any

3 analysis of this? I'm sorry. Let me pursue the

4 question.

5 CHAIR YOUNG: Let him finish his answers.

6 I'm not hearing all of his answers.

7 JUDGE ABRAMSON: You have not run a

8 supercomputer model. I understand that. Have you

9 done any analysis at all of this kind of failure on

10 this kind of pipe to help you make a determination of

11 whether it would or would not cause that pipe to not

12 be able to withstand a design basis earthquake?

13 MR. GUNDERSEN: My experience in other

14 seismic analysis of pipe would indicate that a hole

15 that size in the wall of a pipe that thin would cause

16 it to fail in a design basis event.

17 JUDGE ABRAMSON: Have you done analysis to

18 that effect or have you seen analysis?

19 MR. GUNDERSEN: I already said I have not

20 done an analysis on that pipe.

21 JUDGE ABRAMSON: You have not done

22 analysis. You are saying your experience with other

23 pipes with similar holes. Tell me about what that

24 experience is. I would like to know.

25 MR. GUNDERSEN: My experience doing

1 seismic analysis of pipes, not with a hole that big
2 because nobody postulates a hole that bi, would
3 indicate that should there be a flaw of that size in
4 that pipe, it would fail in a seismic event.
5 JUDGE ABRAMSON: And is that because of
6 analysis you have done or people who have worked for
7 you have done?
8 MR. GUNDERSEN: Yes.
9 JUDGE ABRAMSON: What is the basis of your
10 --
11 MR. GUNDERSEN: It's based on analysis the
12 people who have worked for me have done.
13 CHAIR YOUNG: Do you have something to
14 follow up? I wanted to give him a chance to follow
15 up.
16 JUDGE ABRAMSON: Go ahead. Go ahead.
17 CHAIR YOUNG: What is your comment on the
18 testimony that the applicant and the staff to some
19 degree gave about the experience with the epoxy liner?
20 MR. GUNDERSEN: Well, first off, most of
21 the testimony was based apparently on experience of
22 Indian Point 3. That is not a saltwater plant. That
23 is brackish water and is nowhere near the conditions
24 we are seeing here.
25 Secondly, their analysis showed

1 definitively that we had a total through-wall failure
2 in one system and a failure below min. wall in the
3 other simultaneously. That is already on the record
4 for the Pilgrim plant as having occurred. So we have
5 got --
6 CHAIR YOUNG: You are talking about this
7 one?
8 MR. GUNDERSEN: When they were -- when
9 that leak was developing separately in the other leg,
10 the testimony indicated this morning that there was a
11 through-wall -- not a through-wall crack but a crack
12 in the wall below min. wall in the other train. So we
13 have on the record a situation where both the trains
14 were degraded: one leaking and the other with a
15 below-min. wall indication.
16 JUDGE COLE: Degradation of the liner?
17 MR. GUNDERSEN: No. They were -- no. The
18 degradation was of the pipe.
19 JUDGE COLE: They measured both the pipe
20 and the liner at the same time. And that is what they
21 compared, wasn't it?
22 MR. GUNDERSEN: They took out the liner,
23 and they did an ultrasonic exam on the pipe. And they
24 did a weld overlay to bring the pipe back up to true
25 thickness.

1 JUDGE COLE: All right.

2 JUDGE ABRAMSON: That was out at the end

3 of the pipe, as opposed to the 40-foot section they

4 took out, I think. Is that --

5 MR. GUNDERSEN: Right. But it was in the

6 other train is my point.

7 JUDGE ABRAMSON: Yes.

8 MR. GUNDERSEN: We've got a situation

9 where both trains were in a degraded condition, which

10 I think about an hour ago was one of the issues. You

11 know, can you postulate a situation? And it's already

12 occurred here at Pilgrim, where both trains were in a

13 degraded condition.

14 We also have on the record that a flaw can

15 progress from barely seeable to through-wall in under

16 four years. I actually think there was an indication

17 there might even have been -- there was an inspection

18 in '95, where there was a little failure in the liner

19 and then in '97 and then in '99. It might even be

20 those holes developed in two years. So very quickly

21 --

22 CHAIR YOUNG: Let me just interrupt. It

23 would be helpful to me again. I am not the technical

24 person.

25 MR. GUNDERSEN: Yes.

1 CHAIR YOUNG: So when you are talking
2 about degradation or events, at this point for me it
3 would be helpful if you would describe whether it took
4 place before the epoxy lining was put in there or
5 after and then what effect the epoxy lining would
6 have.
7 MR. GUNDERSEN: Right. The experience
8 with the epoxy liner is less than -- is several years
9 old. And the testimony is about Indian Point 3, which
10 is not a saltwater plant, but the --
11 CHAIR YOUNG: Is there anything --
12 MR. GUNDERSEN: -- experience with the
13 failures was on the rubber-lined system.
14 CHAIR YOUNG: Okay. You just reminded me
15 of another question. I will just ask it now to try to
16 clarify everything as we go. Is there any experience
17 or knowledge of the extent to which saltwater,
18 brackish water, the chemistry of that on degradation
19 of epoxy? I mean, is there any general knowledge on
20 that? I don't --
21 MR. GUNDERSEN: Yes. That gets to -- I
22 was actually going to say that next.
23 CHAIR YOUNG: Okay. Good.
24 MR. GUNDERSEN: You know, in the nuclear
25 industry, we have equipment qualification. If it's an

1 electrical component, you have got to show that it is
2 going to withstand 40 years of radiation inside the
3 containment, including a large exposure after an
4 accident or something like that.
5 We have an EQ program, equipment
6 qualification. I have -- well, I heard an infomercial
7 this morning on how wonderful the pipe is. I haven't
8 seen a quality assurance document that says that this
9 is a 35-year product. It's not on the record, Your
10 Honor.
11 We have got testimony based on a brackish
12 water plant. And this is saltwater. That is a
13 wonderful product. And, yet, in the nuclear industry
14 on safety-related pipe, there is a procedure where one
15 qualifies this stuff for the -- I've heard 35 years.
16 I haven't seen either manufacturer's
17 qualifications or the Pilgrim qualifications on a pipe
18 that -- on an old pipe that had an old liner that then
19 on that liner had applied this epoxy coating to give
20 me any bases to say it had a 35-year life.
21 This is testable. You can do this in a
22 lab. You can pull it out. You can check it and then
23 say, "Okay. It's got a 35-year life." But that's not
24 on the record. I mean, we have heard individuals
25 speak about experience at Indian Point but not in this

1 environment. And it is a testable thing. To my
2 knowledge, that document's not on the record. So
3 we're hanging our hat on an infomercial.
4 CHAIR YOUNG: Okay. Let me just ask a
5 couple of questions and --
6 MR. LEWIS: Judge Young, could I -- this
7 is a funny process because --
8 CHAIR YOUNG: It is. It is unusual, but
9 --
10 MR. LEWIS: But I actually never heard the
11 answer to the question, which I believe you asked,
12 which is, did he have any data indicating that
13 saltwater has an effect on epoxy?
14 If it was a procedure where we were being
15 cross-examined, I would move to strike it all as being
16 non-responsive. And I guess I still would like to
17 know if he is aware of any data that shows saltwater
18 degraded epoxy.
19 MS. LAMPERT: Well, could I just say in
20 response because he had his response --
21 CHAIR YOUNG: Go ahead.
22 MS. LAMPERT: -- that we were considerate
23 of the regulations or, you know, the order. And we
24 did not respond as they were responding, which would
25 have been very appropriate.

1 CHAIR YOUNG: I'm sorry. I didn't
2 understand what you just said.
3 MS. LAMPERT: No, I'm not being picky.
4 What I was saying is I assumed that we were not
5 supposed to question until the end and make that
6 comment.
7 CHAIR YOUNG: It's a different process --
8 MR. GUNDERSEN: There is no document on
9 the record.
10 CHAIR YOUNG: -- in any event. But let's
11 stop because I wanted to ask you a question. And it
12 sort of takes into account what Mr. Lewis was raising.
13 What I understood your answer to be was that there's
14 no information on the extent to which saltwater,
15 brackish water would degrade this kind of epoxy liner
16 because there hasn't been what you termed an equipment
17 qualification for this particular use of this
18 material.
19 And I also think I understood you to say
20 that the normal course of action for any new type of
21 equipment or if you called a lining equipment, that
22 that is a -- you were suggesting that that is a
23 general requirement or industry standard of practice
24 or is that basically what you're saying? And where
25 does that requirement or standard of practice come

1 from?

2 MR. GUNDERSEN: I've heard this morning

3 that this liner is qualified for 35 years. I have

4 seen no documentation to indicate that. I have heard

5 people talk about experiences in firewater systems and

6 things like that.

7 CHAIR YOUNG: Okay. Let me interrupt you

8 again.

9 MR. GUNDERSEN: So I --

10 CHAIR YOUNG: I am going to interrupt you

11 again. Okay? Because my question is where the

12 requirement for equipment qualification comes from.

13 And that is a purely informational -- I am seeking

14 information by that question.

15 What I heard the energies expert say was

16 -- I don't think they ever used the word

17 "qualification." I think what they said was that

18 there is 20-some years experience in the industry

19 using it and that there's more experience than that

20 using it in other contexts. I don't think I heard them

21 use the word "qualification."

22 So for purposes of explaining to you how

23 we operate, everything that is said here today is on

24 the record for purposes of the evidence before us.

25 The fact that something is not in a document doesn't

1 make it any less worthy as evidence for us to
2 consider. What we look at is how much it holds
3 together, how relevant it is, how much weight we
4 should give it. So that is sort of a basis from which
5 to talk.
6 Now, as to your answer about qualification
7 of equipment, to use an analogy, we hear about drug
8 testing. There are requirements that drugs before
9 they go on the market have certain testing that has to
10 be done.
11 Are you talking about a formal process
12 that is required either by NRC requirements and
13 regulations or NUREGs or is there some standard
14 industry practice or is it an INPO, I-N-P-O, standard?
15 I'm trying to understand what you are
16 talking about when you talk about equipment
17 qualification, not to challenge you, just to try to
18 understand what you are talking about.
19 MR. GUNDERSEN: Yes. I'm drawing a blank
20 on the -- within 10 CFR where it is. There are
21 industry experience bases that are used in different
22 inspections. For instance, every weld in a nuclear
23 reactor is inspected every ten years. For instance,
24 the recirculation pump seals are known to fail every
25 maybe five or six years or whatever. And they are on

1 a program of periodic replacement based on an industry
2 standard.
3 Obviously if a short-lived component gets
4 either inspected or replaced frequently, a long-lived
5 one can have a longer inspection period. And I am
6 aware of nothing that shows that this 35-year life in
7 a plant in this environment with a coating applied
8 over top of a rubber liner that is already at the end
9 of its life, that -- the expectancy that that liner
10 would last 35 years.
11 So my suggestion is that -- not that the
12 liner is poor but that it should be inspected more
13 frequently than ten years.
14 CHAIR YOUNG: Okay.
15 MR. GUNDERSEN: I had a couple of other
16 things, but --
17 CHAIR YOUNG: Go ahead. Go ahead.
18 JUDGE ABRAMSON: Let's pursue the question
19 that Mr. Lewis wanted to ask, which is, do you have
20 any data to support the proposition that saltwater
21 would degrade epoxy at a more rapid rate than
22 freshwater?
23 MR. GUNDERSEN: My experience on salt,
24 brackish, and freshwater plants indicates that in
25 general saltwater is the worst for any component.

1 JUDGE ABRAMSON: Do you have any
2 experience with those on epoxy?
3 MR. GUNDERSEN: I already indicated that
4 I don't have experience on epoxy liners.
5 CHAIR YOUNG: You said you had more that
6 you wanted to tell us in follow-up to the earlier
7 discussion.
8 MR. GUNDERSEN: Yeah. I actually just
9 have a few more issues. Thank you.
10 Two things. My concern remains that if
11 there is a leak, that it could cause catastrophic
12 failure, as I have discussed earlier. This liner, just
13 to make sure, is not a seismic barrier. It is a
14 pressure barrier.
15 And I want to make sure that we all
16 understand that when you are doing the seismic
17 analysis, you are assuming the pipe is relatively
18 ductile and this liner is more brittle. So it is the
19 pipe that has to withstand the motion.
20 So adding this liner doesn't strengthen
21 the pipe from a seismic standpoint but, rather, seems
22 to be better than the thing which went before,
23 although I haven't seen, you know, a lot of data in
24 that regard.
25 Secondly --

1 CHAIR YOUNG: In the seismic context, you
2 are talking about if there were holes that were either
3 big enough on their own or several small ones
4 together, that that is what you are worried about from
5 a seismic standpoint, correct?
6 MR. GUNDERSEN: Correct. That could cause
7 the pipe to collapse, which would affect the back
8 pressure on the system and, hence, the relative flow
9 through the heat exchanger.
10 CHAIR YOUNG: So do you have anything to
11 raise a doubt about whether when they discovered these
12 holes they took out the parts with the holes or that
13 what remained didn't have either holes or thinning to
14 the extent that they would be susceptible to damage in
15 a seismic event?
16 MR. GUNDERSEN: There's documentation in
17 the file which has not been provided. It's our
18 exhibits. Thirty-four is one of them about the
19 coating and how the applicant didn't ever assume that
20 the coating was there, that it was nice to have but --
21 CHAIR YOUNG: The rubber or the epoxy?
22 MR. GUNDERSEN: Well, at the time those
23 reports were written, it was when both were in play.
24 And it's not clear. Certainly the rubber, but I'm not
25 sure that it also relates -- that the applicant's

1 questions relate to that liner as well. But prior to
2 that liner being sold, they were not taking credit for
3 the rubber to which the liner is now attached.
4 I do have a concern that a visual
5 inspection of this pipe, which was done before this
6 sock was applied -- we already have indications that
7 the liner peeled. And it's not clear to me that there
8 might not be moisture behind that liner in other
9 places that were undetected. So that the possibility
10 of a through-wall for moisture that remains there when
11 the sock was put on to me is real.
12 There was one comment by the NRC about
13 ultrasound. And I would agree that a perpendicular
14 ultrasound would be impossible to detect any problem
15 because you are going through several layers of
16 varying thicknesses and roughnesses and things like
17 that.
18 However, there is a parallel wave
19 ultrasound which sends a wave through the pipe. And
20 for short lengths like we're talking about, a parallel
21 wave ultrasound would likely -- and, again, I haven't
22 spent the hundreds of hours to analyze it, but the
23 parallel wave ultrasound could indicate the wall
24 failures that are no longer detectable by ultrasound
25 because of the liner put in place.

1 CHAIR YOUNG: Did you understand that the
2 inspection they described, the visual inspection
3 before they put the epoxy liner -- did you understand
4 them to say that they had left anything in place where
5 there would be a possibility of that moisture being
6 behind the rubber lining or was there something --
7 what mechanism would cause that to --
8 MR. GUNDERSEN: Right. I understood it
9 that they would send a crawler with cameras on it,
10 which looked for deformations in the liner. And I
11 also understood this is -- when I ran an ultrasonic
12 business, we had skinny guys. That was their job, to
13 crawl inside pipes. This pipe is -- large portions of
14 it are reachable by skinny people.
15 A visual inspection -- we paid them well,
16 by the way.
17 (Laughter.)
18 MR. GUNDERSEN: A visual inspection --
19 CHAIR YOUNG: They have a better
20 experience than the old chimney sweeps. That's what
21 it reminds me of. Anyway --
22 (Laughter.)
23 MR. GUNDERSEN: But, anyway, I don't
24 believe that that technique -- the technique they used
25 would detect gross deformities in the wall. And by

1 "gross," you know, I am thinking about a bubble that
2 might be six inches around and maybe a half-inch. But
3 smaller bubbles I'm not convinced would be detected by
4 that technique, which would mean there is still
5 moisture behind that rubber barrier.
6 CHAIR YOUNG: What would cause you to
7 think that there would necessarily be moisture, as
8 opposed to just air? I mean, maybe that's an ignorant
9 question, but I'll ask it anyway.
10 MR. GUNDERSEN: Yeah. It may not be all
11 water. It could be water and air. But given that the
12 system had water behind it, I would expect it could be
13 moisture bubbles behind the rubber, which is now
14 covered by the sock.
15 And given that we already have a history
16 that can break through that wall, you know, I think
17 that --
18 CHAIR YOUNG: A history of?
19 MR. GUNDERSEN: Of once moisture gets
20 behind that rubber, that the pipe can degrade. I
21 think a more frequent than ten-year inspection is
22 appropriate.
23 CHAIR YOUNG: I don't want to interrupt or
24 belabor the point, but for me it is helpful -- and I
25 appreciate it -- to explain it from a lay person's

1 viewpoint.

2 Did we have information that the

3 degradation of the metal pipe was when water got

4 behind the rubber coating or when the rubber coating

5 developed a hole so that -- and I understand,

6 obviously, that there could be a very, very small

7 hole, but if there could be a way for moisture to get

8 behind the rubber lining without there actually being

9 a visible hole in the rubber lining, how would that

10 occur?

11 MR. GUNDERSEN: I guess if there were no

12 visible hole and if the inspection really was capable

13 of finding every visible hole, you are correct. It

14 could be just laminated with a void behind it.

15 CHAIR YOUNG: A what?

16 MR. GUNDERSEN: A void --

17 CHAIR YOUNG: A void?

18 MR. GUNDERSEN: -- of some type. I think

19 you're correct. This is a 2001 document that I would

20 like to refer to. And they're talking about the

21 lining. So 2001 is about the time the sock is -- but

22 I'm not clear that it's --

23 CHAIR YOUNG: Why don't you go ahead and

24 distribute that if we're talking about a document --

25 MR. GUNDERSEN: Okay.

1 CHAIR YOUNG: -- so everyone can see?

2 MR. GUNDERSEN: Can I read while she's

3 doing that or do you want to wait?

4 JUDGE ABRAMSON: Please. Let's keep

5 moving.

6 CHAIR YOUNG: If you're reading from it.

7 MR. GUNDERSEN: It's on page -- well, it's

8 got a Bates number on it. It's PILLR. Oh, my God.

9 There's a whole bunch of zeroes. And then it's 665.

10 MR. LEWIS: Judge --

11 MR. GUNDERSEN: The third paragraph says

12 --

13 MR. LEWIS: Judge, I'm --

14 CHAIR YOUNG: Hold on.

15 MR. LEWIS: I would object to this

16 document. Mr. Gundersen is referring to a draft

17 document and a partial document. And there is no

18 showing that this document is reliable or admissible.

19 I understand we disclosed it. We

20 disclosed every document that was relevant. But the

21 question is not relevance. The question is whether

22 this is an admissible, reliable document.

23 CHAIR YOUNG: What is the basis of the

24 objection because it is not a final document?

25 JUDGE ABRAMSON: It is incomplete.

1 MR. LEWIS: It is a draft document. It is
2 a partial document. And, therefore, it is not
3 reliable.
4 MS. LAMPERT: May I please?
5 CHAIR YOUNG: Go back and speak into the
6 microphone. My question is, what is the basis --
7 MR. LEWIS: We --
8 CHAIR YOUNG: Let me finish my question.
9 MR. LEWIS: Yes.
10 CHAIR YOUNG: What is the basis of the
11 objection simply because it is a draft document?
12 Obviously if it is not complete, you could add
13 whatever there would be necessary to complete it. But
14 is there an evidentiary rule that prohibits the
15 admission of drafts, as opposed to final documents?
16 MR. LEWIS: Normally a document has to be
17 sponsored with a showing that it is accurate and
18 reliable for it to be admissible. Mr. Gundersen is
19 certainly not sponsoring it or identifying it as
20 reliable.
21 CHAIR YOUNG: But it is your document,
22 right?
23 MS. LAMPERT: It is your document.
24 MR. LEWIS: It is our document, but it is
25 a draft and it is a partial document.

1 CHAIR YOUNG: And what's --

2 MR. LEWIS: And, therefore, it is not

3 necessarily accurate.

4 CHAIR YOUNG: What is the evidentiary rule

5 that pertains to draft documents?

6 MR. LEWIS: The NRC rules --

7 CHAIR YOUNG: I'm not aware of any.

8 MR. LEWIS: NRC rules of practice allow

9 the Board to admit documents that aren't reliable. I

10 mean --

11 CHAIR YOUNG: What I am saying is, we

12 don't follow the rules of evidence here. However, in

13 another life I did. And in other forums, they do.

14 And there are rules of evidence out there to which we

15 can look for guidance.

16 So if you are making an objection on the

17 basis of this document being a draft, what is the

18 evidentiary basis for that objection?

19 MR. LEWIS: Simply that there has been no

20 foundation to establish that it is either accurate or

21 reliable. And there is no authentication.

22 CHAIR YOUNG: If it's your document at the

23 time it was produced, presumably whoever produced it

24 intended something by it. So that would come under,

25 arguably, the category of an admission against

1 interest.

2 So what is the basis for the unreliability

3 of the document in your view?

4 MR. LEWIS: The fact that it hasn't been

5 validated by the company. It was a draft work in

6 process by one individual. It's certainly not an

7 admission by the company.

8 MS. LAMPERT: Can I say something?

9 MR. LEWIS: We have provided the full and

10 final document. Maybe the same statement is in there.

11 And I would not object to the full and final document

12 being admitted. I do object when Ms. Lampert takes

13 some portion of a draft, instead of the full and final

14 document.

15 JUDGE ABRAMSON: Let's pursue this.

16 CHAIR YOUNG: Do we have the full one? Do

17 we have the final?

18 MS. LAMPERT: Okay. First let's address

19 why it is part of the document and not the whole.

20 CHAIR YOUNG: Okay.

21 MS. LAMPERT: What?

22 CHAIR YOUNG: First, before you do that,

23 do you have the full document?

24 MS. LAMPERT: Not with me today because it

25 said the same thing and --

1 JUDGE ABRAMSON: Do you have the final
2 document with you, Mr. Lewis?
3 MR. LEWIS: We can provide it.
4 JUDGE ABRAMSON: Fine. Let's get the
5 final document.
6 CHAIR YOUNG: Why don't we put this aside.
7 And when we break for lunch, can you get it during
8 lunch and then bring it back? Because that would
9 obviate a lot of this argument.
10 MR. LEWIS: Yes.
11 CHAIR YOUNG: Okay. And also at lunch --
12 we probably need to break soon for lunch -- also we
13 need to get the complete version of the condition
14 report. At this point it might be good to ask, how
15 close are we to finishing up the service water issues?
16 And at what point would it be good to break? Can we
17 finish before lunch on this?
18 JUDGE ABRAMSON: We should be able to
19 finish before lunch, but I want to hear what Mr.
20 Gundersen was starting to use this for. Do you want
21 to wait until after lunch or is this a big point or a
22 little point?
23 MR. GUNDERSEN: I think it will be quick.
24 First of all, this quote appears in two other
25 documents as well.

1 JUDGE ABRAMSON: Okay. So tell us about
2 the gist of it and what you --
3 MR. GUNDERSEN: The quote simply says,
4 "The piping that is underground is protected by a
5 coating, but since the coating does not have a
6 specified life, the aging effects will be evaluated
7 for carbon steel." Again, we get back to the fact of
8 --
9 CHAIR YOUNG: I'm sorry.
10 MR. GUNDERSEN: -- a specified life of a
11 coating and --
12 CHAIR YOUNG: I'm sorry. Again, being the
13 lay person, I have to understand what I am hearing.
14 Are you talking about the exterior or interior
15 coating?
16 MR. GUNDERSEN: It's unclear with the
17 document.
18 CHAIR YOUNG: Okay. Thank you.
19 JUDGE ABRAMSON: Are we done?
20 MR. GUNDERSEN: There's also two other
21 documents with that identical quote in them.
22 CHAIR YOUNG: Okay.
23 MR. GUNDERSEN: Yes, I'm done.
24 JUDGE ABRAMSON: Okay. So, Mr. Gundersen,
25 let's come back for a minute to what I keep trying to

1 drag us back to, which is, can this component satisfy
2 its intended safety function, which is to make sure it
3 doesn't get blocked and make sure that both trains
4 don't get blocked by some event.
5 You have suggested that the event that we
6 need to worry about is the earthquake event. Is that
7 correct? Is there some other event that you think
8 might also present this kind of challenge?
9 MR. GUNDERSEN: The most likely one in my
10 mind is a design basis earthquake, yes.
11 JUDGE ABRAMSON: Design basis earthquake.
12 Okay. So now let me come to the applicant and the
13 staff and let's go to the --
14 CHAIR YOUNG: He asked you, is there any
15 other? You said that --
16 MR. GUNDERSEN: I think they're much more
17 remote.
18 CHAIR YOUNG: Okay.
19 JUDGE ABRAMSON: So let me come to the
20 applicant and the staff. Let's turn to 10 CFR 54.4.
21 And let's talk about which of these criteria we're
22 worrying about.
23 54.4 says that the intended functions that
24 we're worrying about could be safety-relates systems
25 that have to remain functional during and following a

1 design basis event. Do both of these pipes need to
2 remain functional during a design basis earthquake?
3 MR. COX: Yes, that's correct.
4 JUDGE ABRAMSON: Plant would be shut down
5 at the design basis earthquake, right?
6 MR. SULLIVAN: That is correct.
7 JUDGE ABRAMSON: And when it is shut down,
8 do you need to have both trains? Will one train
9 suffice or do you need either of these to continue to
10 remove heat?
11 MR. SULLIVAN: Either of these. The plant
12 is designed to be single failure.
13 JUDGE ABRAMSON: But you must have one of
14 these functional after the design basis earthquake to
15 remove the heat?
16 MR. SULLIVAN: That's correct.
17 JUDGE ABRAMSON: Okay. So the question
18 that we're addressing is whether there needs to be a
19 component in the aging management program that would
20 do something in the way of inspection to assure that
21 this pipe doesn't get plugged by a design basis
22 earthquake. Is that really where we are going here?
23 Mr. Gundersen, is that correct?
24 MR. GUNDERSEN: Yes.
25 MR. SULLIVAN: I am sorry. Was there a

1 question?

2 JUDGE ABRAMSON: No. I am trying to

3 understand what Mr. Gundersen is suggesting. And it

4 seems to me what it is arguing is that the aging

5 management program needs to have more frequent

6 inspections or some more frequent inspection of these

7 pipes to ensure that degradation, aging-related

8 degradation, isn't taking place in this pipe such that

9 the pipe might fail in a design basis earthquake in a

10 manner that would cause the pipe to be fully blocked

11 and not let water out of the heat exchanger.

12 What does the plant do about the inlet

13 pipe? It's not carrying radioactive water. But what

14 is your program for the pipe bringing in that water?

15 That's to me if you have a significant break in that,

16 you've got a problem, more likely problem, than a plug

17 of the outlet pipe.

18 MR. SULLIVAN: That is correct. The inlet

19 piping is titanium piping. It is analyzed for seismic

20 loading.

21 JUDGE ABRAMSON: And it's titanium. So

22 the corrosion and the failure problems are much

23 smaller? Is that the --

24 MR. SULLIVAN: Although they are much

25 smaller because it is titanium, that piping was

1 wrapped with a protective coating as well.

2 JUDGE ABRAMSON: Now, it's not in this

3 proceeding because it doesn't carry radioactive water,

4 but what is your inspection program for that?

5 MR. SULLIVAN: The aging management

6 program for the external surface is the same as for

7 the discharge piping.

8 JUDGE ABRAMSON: So it's a buried pipe

9 tanks inspection program?

10 MR. SULLIVAN: That's correct.

11 JUDGE ABRAMSON: Okay. Mr. Gundersen,

12 early in the life of this epoxy coating, one of these

13 -- well, not early, actually. One of these systems is

14 going to be inspected right before the license

15 extension would begin if it's granted. The other

16 system would be in the year following the grant of the

17 license extension.

18 If you were running a program, what

19 assumptions or how would you approach the question of

20 degradation of the epoxy and how would you determine

21 how frequently it needed to be inspected? Would it

22 vary with the life? Would you do it once early on to

23 see things were right and then give it a bigger

24 period? How would you address the problem?

25 MR. GUNDERSEN: I think it is in my

1 testimony. And it is pretty straightforward. I have
2 no problem with a ten-year inspection interval for the
3 whole pipe. However, I think it should be done like
4 ASME 11 does for a nuclear reactor, which breaks that
5 overall tenure up into segment, so essentially every
6 refueling outage, do a portion of it.
7 And that would allow essentially six
8 refueling outages in ten years approximately. That
9 would allow one-sixth of the pipe to be inspected
10 every 18 months.
11 JUDGE ABRAMSON: And you would be
12 satisfied with a visual inspection at this point given
13 that there's some uncertainty about whether a UT
14 inspection would work?
15 MR. GUNDERSEN: There's another issue,
16 which probably has to wait until after lunch. You can
17 apply cathodic on the outside with an impressed
18 current. That combination of a visual on the inside
19 and an impressed current, cathodic protection on the
20 outside would satisfy me.
21 And we get back to the monitoring well
22 issue, but within --
23 JUDGE ABRAMSON: No. That's all right.
24 I'm just --
25 MR. GUNDERSEN: Within my area of

1 expertise, impressed current, cathodic protection on
2 the outside, and a one-sixth every refueling outage
3 interior inspection would --
4 JUDGE ABRAMSON: So let me ask the
5 applicant, what you have is you do the whole pipe once
6 every ten years with some sort of a -- I've forgotten
7 what the word you --
8 MR. SULLIVAN: A crawler.
9 JUDGE ABRAMSON: Crawler, right. That can
10 be accomplished entirely within a refueling outage?
11 MR. SULLIVAN: Yes, it can.
12 JUDGE ABRAMSON: And what would your
13 reaction be to some proposal to do part of it more
14 frequently? Would that be --
15 MR. SULLIVAN: Creates an undue burden, an
16 unjustified burden for the station. And that's based
17 on the experience base used in epoxy linings, our
18 discussions with the vendor of the epoxy piping system
19 that they should be good for approximately 35 years.
20 We have accelerated that to take a look at the lining
21 every ten years. And we believe that that is
22 adequate.
23 JUDGE ABRAMSON: And I understand the
24 staff is in agreement that ten years is appropriate
25 for this type of lining?

1 DR. DAVIS: That is correct.

2 JUDGE ABRAMSON: Dick, do you have any

3 follow-up on this?

4 JUDGE COLE: I have just got a general

5 question on corrosion. We have a couple of corrosion

6 experts here, and I would like them to respond to it

7 because it pertains to the strength of the pipe.

8 Corrosion being an electrical phenomenon

9 and looking at the Entergy exhibit 67, I notice there

10 are several holes in the pipe where the thickness of

11 the metal is zero.

12 Considering the way corrosion takes place

13 in the pipe, what does that say about the thickness

14 over the other sections of the pipe? What would they

15 likely be considering the fact of the way corrosion

16 generally operates?

17 MR. SPATARO: Are we talking about the

18 rubber lining failures?

19 JUDGE COLE: No. I'm talking about the

20 metal pipe.

21 JUDGE ABRAMSON: The piece that was cut

22 out, Dick, or the pipe? Yes.

23 JUDGE COLE: Or any pipe that has a thin

24 hole leak in it or a quarter-size hole in it.

25 MR. SPATARO: Okay. What exactly is the

1 question, then?

2 JUDGE COLE: What does that say about the

3 thickness of the rest of the pipe? What is that

4 likely to be as compared to the zero thickness at the

5 hole?

6 MR. SPATARO: Okay.

7 JUDGE COLE: In other words, when you see

8 a hole in a pipe and if you've looked at a lot of

9 pipes, what would you say about the thickness of the

10 pipe as you or the thinness of the pipe as you depart

11 from the point where most of the corrosion has taken

12 place?

13 MR. SPATARO: Okay. In this instance, let

14 me start by saying that the rubber lining is placed in

15 a specially prepared surface of the inside of the

16 pipe. The rubber lining has a special adhesive that

17 is placed on this clean internal surface of the pipe.

18 The rubber lining is then inserted and

19 vulcanized. It's a curing process that's done with

20 heat, generally if it's a fairly small component in a

21 furnace. Otherwise it's done in place by insulating

22 the pipe and providing a heat source to the internals

23 of the pipe.

24 Should the liner fail -- and we saw it

25 fail here. It fails by chipping out pieces of the

1 liner. The corrosion would occur at the point where
2 the substrate metal is exposed. That corrosion would
3 continue.
4 And, as we see here, it continued through
5 the wall and did not really progress outward from the
6 wall to any great extent such that as the liner fails,
7 one would expect corrosion product to go under the
8 liner in an attempt to delaminate that liner.
9 Because the liner is vulcanized to the
10 metal surface, that process is going to be severely
11 restricted. It is not quite the same as an ordinary
12 coating would be placed on that because that is
13 strictly a mechanical bond.
14 Here the bond is not only mechanical, but
15 as the liner expands under the vulcanizing process, it
16 presses it. It exerts a pressure against the pipe
17 itself. So that you have a pressure bond as well as
18 the adhesive bond of the material itself.
19 The corrosion process would have to
20 undermine that by deteriorating the pipe. The amount
21 of lateral degradation is much, much smaller than the
22 penetrating degradation of the pipe, such that you
23 would get a hole first. And then the corrosion
24 process would continue apace by enlarging that hole,
25 rather than proceeding under the liner, causing it to

1 lift.

2 JUDGE COLE: And not by causing an overall

3 thinning of all the rest of the pipe?

4 MR. SPATARO: No, not at all. Not at all.

5 JUDGE COLE: So what does that say about

6 the strength of the pipe with a hole in it?

7 MR. SPATARO: It's not degraded except

8 where the hole is.

9 JUDGE COLE: All right, sir.

10 MR. COX: Let me add a little bit just

11 based on my experience as an operator. We have had

12 service water pipe leaks within the plant at Arkansas

13 that are in piping that is not buried. It's above the

14 ground.

15 Typically those leaks are in holes.

16 They're fairly localized. Of course, when you have

17 that leak, you have to turn it over to your structural

18 engineers. They do operability evaluations.

19 The experience that I have from dealing

20 with those folks on these kinds of issues is that when

21 you say "minimal wall," they are looking at -- minimal

22 wall is based on if the whole pipe was at that minimum

23 wall thickness.

24 And generally when you have this type of

25 corrosion, you're looking at a fairly localized area.

I don't know of any cases where we found through-wall leaks in piping where there has been a problem with satisfying the seismic criteria with the remaining metal because generally the rest of the pipe, most of the pipe, away from that through-wall leak is greater than min. wall. And it's generally not a problem to satisfy seismic pressure.

CHAIR YOUNG: When you say, "greater than min. wall," you mean there is still some coating.

JUDGE ABRAMSON: It's closer to the design. No. It means the difference --

MR. COX: No. The pipe itself.

JUDGE ABRAMSON: -- is closer to the original design. It's not worn down to the minimum.

MR. COX: That's correct. There is a nominal wall thickness. The minimum wall is generally something less than what you get when you receive the pipe.

CHAIR YOUNG: Okay.

JUDGE COLE: Do any of the staff corrosion experts have any comment on that?

DR. DAVIS: What he says is correct. I've looked at buried pipe for many, many, too many years. And the National Bureau of Standards, which is now NIST, did a very extensive study. What they found was

1 in the United States, on average a bare steel pipe
2 will corrode through in 28 years.
3 JUDGE COLE: Carbon steel?
4 DR. DAVIS: Carbon steel.
5 CHAIR YOUNG: How thick?
6 DR. DAVIS: It really doesn't matter much.
7 Once the corrosion starts, it goes fairly quickly.
8 CHAIR YOUNG: Oh, okay. I see.
9 DR. DAVIS: In the coated pipe, you get
10 holes with no loss of material other than where the
11 defect in the coating is, which is the case here. And
12 so I would not expect to see any of the other wall
13 thickness reduced except for you have defects in the
14 coating.
15 And it is very localized. You could have
16 possibly some under-coat corrosion, but it would be
17 very minor.
18 JUDGE ABRAMSON: If you had that sort of
19 degradation, what would it do to the structure, to the
20 ability of that pipe to withstand the design basis
21 earthquake?
22 DR. DAVIS: I'm not really a seismic
23 person.
24 JUDGE ABRAMSON: You're not a seismic?
25 DR. DAVIS: But, in my opinion, it would

1 have very little effect. You can actually have holes
2 in pipe for cross connections. And it doesn't affect
3 the strength. But maybe Terrence.
4 MR. CHAN: When I had members of my staff
5 review, do their seismic analyses, I have not seen an
6 instance where localized holes have significantly
7 affected the ability of a piping system to withstand
8 a seismic event.
9 JUDGE ABRAMSON: And have you seen
10 analyses or had your staff performed analyses for
11 pipes that were degraded greater than what we're being
12 told happened here? In other words, we've got a
13 quarter-inch or several quarter-inch holes or maybe an
14 area that that's big?
15 For the record, that is a couple of inches
16 in diameter. Several quarter size holes within close
17 proximity to each other over a pipe that is on the
18 average 20 inches diameter.
19 MR. CHAN: Well, that is -- the
20 significance of a particular hole is dependent upon
21 the loading that is imposed on that pipe as well as
22 other parameters.
23 JUDGE ABRAMSON: Right.
24 MR. CHAN: Now, but the analyses that I
25 have had staff look at, they have looked at degraded

1 conditions, whether it's localized thinning or whether
2 there is more global thinning with no through-wall, no
3 through-wall penetration or no through-wall leakage.
4 And those analyses, to the best of my
5 recollection, have not indicated that those pipes
6 would not be able to withstand the design basis
7 earthquake.
8 JUDGE COLE: Mr. Gundersen, you would like
9 to comment?
10 MR. GUNDERSEN: Thank you.
11 You could probably take a drill and put a
12 three-quarter-inch hole in this pipe, and it would be
13 just fine. My concern is that when smaller holes gang
14 up in a more diffuse pattern, as indicated in that
15 picture, that there is a broader area of wall
16 thickening that can lead to stress risers in the event
17 of a design basis event as that pipe flexes.
18 So it is not about a single hole. It is
19 about numerous small holes, maybe through-wall, but,
20 as that picture indicates, too, where there are
21 through-wall small holes, there is -- also between
22 them the wall becomes much, much thinner. So that
23 essentially while it may not be leaking that much
24 water, in fact, there is no pipe there.
25 JUDGE ABRAMSON: Is your experience

1 consistent with what we heard the staff and the
2 applicant's experts tell us about how corrosion moves
3 parallel to the surface underneath the coating? Do
4 you have experience where you are worried about
5 corrosion that might move underneath the coating,
6 which is what is being speculated here, not normal to
7 the coating but underneath it, right? So you've got
8 a --
9 MR. GUNDERSEN: Yeah. I understand.
10 JUDGE ABRAMSON: You understand?
11 MR. GUNDERSEN: I think the picture
12 indicates that, you know, there was maybe a six by
13 six-inch piece that had been -- maybe four by
14 four-inch that was attacked. There's not much
15 indication out beyond that in the photograph that the
16 attack extended beyond, you know, four by four or six
17 by six.
18 So I would -- where both surfaces, where
19 the liner is intact on one side and where the
20 protective coating on the outside is intact, where
21 both of those phenomena exist, the parallel
22 degradation would be less than the transverse
23 degradation.
24 Did I answer that?
25 JUDGE ABRAMSON: I think so.

1 MR. GUNDERSEN: Okay.

2 CHAIR YOUNG: I have three follow-up
3 questions. And then as far as I know, except for
4 these two exhibits that we need to take care of, that
5 I hope will maybe cover the service water, although if
6 anything else comes up, we won't foreclose that.

7 The first is you heard Dr. Gundersen talk
8 about the equipment qualification, his argument about
9 the equipment qualification and I guess what
10 manufacturer's information is provided with regard to
11 the epoxy liner and that in the of a saltwater
12 environment, as opposed to a brackish or freshwater
13 environment.

14 Can you follow up on that and give us any
15 information that you have that would be relevant to
16 that?

17 MR. SPATARO: Yes, I can. The resins in
18 question have been in use throughout the industries
19 for well over 50 years. That's first. Second --

20 CHAIR YOUNG: Industries you mean other
21 than nuclear?

22 MR. SPATARO: Oh, absolutely, yeah.
23 Power, water treatment, chemical factories, you name
24 it. The second thing is that the tests show because
25 each of the manufacturers does provide what the

1 coatings or what the resins will withstand and what
2 they will not withstand.
3 And these epoxies are totally immune to
4 all waters, does not matter whether it's brackish,
5 fresh, lake, sea, does not matter at all. What is
6 more important is that they have limits on temperature
7 applications and on certain types of chemicals, which
8 will break down the resins, but not waters at all, not
9 any of the waters.
10 CHAIR YOUNG: These are the manufacturer's
11 guidelines for using it, in other words?
12 MR. SPATARO: That's true. That's true.
13 CHAIR YOUNG: Okay. And the chemical
14 things that you're worried about, could that include
15 saltwater or --
16 MR. SPATARO: No, not at all, absolutely
17 not.
18 CHAIR YOUNG: So different sorts of --
19 MR. SPATARO: We're talking acids bases,
20 chemical compounds of an aggressive nature. For
21 instance, if I were using the epoxy in a chemical
22 factory, they would definitely tell me "Whoa. You
23 can't use it there."
24 If I were using it, say, at Pilgrim, where
25 we use sulfuric acid and sodium hydroxide in the water

1 purification process through the filtration systems,
2 there would be guidelines as to which epoxies would
3 work and which ones would not work. And we would not
4 use them in those instances.
5 But when you are talking about waters in
6 general, all types of water, no, there are no
7 limitations to the use.
8 CHAIR YOUNG: My second question is you
9 heard Dr. Gundersen talk about the possibility of
10 using parallel wave ultrasound. Can you address that?
11 I don't know which one of you would be the one?
12 JUDGE ABRAMSON: Do any of you have any
13 expertise in it?
14 MR. SULLIVAN: Before we move on to that
15 question, I would like to clarify that at Pilgrim, we
16 do not use sulfuric acid or hydroxides for water
17 treatment systems. We do use a sodium hypochlorite in
18 our service water system to control microfouling.
19 CHAIR YOUNG: Would that fall under any of
20 the warnings from the manufacturer?
21 MR. SULLIVAN: We don't use this piping
22 system in that.
23 CHAIR YOUNG: You don't use that with
24 these pipes?
25 MR. SULLIVAN: Yes.

1 CHAIR YOUNG: Okay.

2 MR. SULLIVAN: That's correct.

3 MR. COX: I don't have much experience
4 with the ultrasonic method that Mr. Gundersen referred
5 to. We did include in our license renewal application
6 -- we actually called it an exception to the program
7 because we wanted to provide a provision to use a more
8 advanced technique.

9 If something is developed and is proven to
10 be effective that would allow you to do that whole
11 length of discharge piping without digging it up, we
12 would certainly want to be able to take advantage of
13 that. So we did allow for that option.

14 I think we called or we mentioned one
15 example as a phased array, ultrasonic technology. I'm
16 not sure if that's the same as the parallel wave that
17 Mr. Gundersen mentioned, but if a parallel wave
18 technology proves to be better and more effective at
19 evaluating that piping and we can do that without
20 digging up the piping, we certainly wanted to be able
21 to take advantage of that.

22 JUDGE ABRAMSON: Mr. Gundersen, would you
23 provide some information to the applicant on that
24 technique, please, not now at this moment but when you
25 get a chance?

1 MR. GUNDERSEN: Yeah. My comment about
2 the parallel wave was in response to I think an NRC
3 question. I would -- and I agree that the normal
4 perpendicular portion -- but I do agree with Entergy
5 that the phase array approach that they have proposed
6 as an exception would detect leaks in the wall.
7 Again, my problem is not with that
8 technique. It's that I don't think you should wait
9 ten years to apply it.
10 CHAIR YOUNG: Anything further on that?
11 I have one more question if not.
12 MR. SPATARO: Judge Young?
13 CHAIR YOUNG: Yes?
14 MR. SPATARO: May I provide two
15 clarifications, please?
16 CHAIR YOUNG: Yes.
17 MR. SPATARO: My use of the sulfuric acid
18 and the sodium hydroxide comes from pressurized water
19 reactors and not boiling water reactors. So their
20 correction of my statement is absolutely true.
21 The second is that Mr. Gundersen pointed
22 out that the specimen you are looking at in that
23 picture is four by four or six by six inches. That's
24 the specimen size that we chose to examine with
25 respect to the degradation.

1 The degraded area is far less than four by
2 four and six by six, showing and proving that the
3 lateral degradation is really quite small with respect
4 to the amount of penetration, the area of penetration
5 through the wall.
6 CHAIR YOUNG: My last question has to do
7 with a reference in Entergy's testimony to the salt
8 service water system being credited in the safe
9 shutdown analysis for fire protection.
10 And my question, first of all, is, could
11 you just explain where that would fall? It's a backup
12 system, I presume. And what other protections would
13 come into place before you had to reach that?
14 And then are there any -- I don't know,
15 but I was recently involved in another proceeding
16 where Shearon Harris was one of several plants that
17 had had some problems with the fire protection systems
18 that they had in place. And I think there's a new
19 rule that's being worked out at the NRC on that. Does
20 that come into play in any way with the fire
21 protection issue?
22 And the reason I am asking that is because
23 obviously that relates to peripheral safety functions,
24 but it's something that is related to safety. Can you
25 just provide any clarification on that?

1 MR. SULLIVAN: The salt service water
2 function for appendix R purposes is heat removal when
3 we are in pressure control mode or level control with
4 HPSI and RPSI systems in operation.
5 MR. COX: We wouldn't treat the -- whether
6 it was in-scope for A-1, which is a safety-related
7 function, or for A-3, we would -- essentially its
8 function in both cases is heat removal from
9 safety-related equipment. So we wouldn't treat it any
10 differently based on those two different intended
11 functions.
12 CHAIR YOUNG: Let's see. A, B, C, and
13 BRS.
14 MR. SULLIVAN: That's Alan Cox and myself.
15 CHAIR YOUNG: Okay. You said that the
16 same is also credited under A-3 because the salt
17 service water is credited in the 10 CFR Part 50,
18 appendix R, safe shutdown analysis for fire
19 protection, 10 CFR 50.48.
20 I guess what I thought that meant was that
21 if, for some reason, you needed to use this to
22 supplement the normal or the regular fire protection
23 system. Am I not understanding this or what?
24 MR. COX: Yeah. Let me explain that. The
25 appendix R scenario or the appendix R regulations

1 require you to be able to achieve safe shutdown when
2 you have a fire that affects another part of the
3 plant.
4 This system is not used to put out the
5 fire or provide any kind of fire protection. It is
6 used to get the safe shutdown when you have had a fire
7 that affected something else.
8 CHAIR YOUNG: Okay. Okay. Now I
9 understand better anyway.
10 Any follow-up on any of those three things
11 that I had asked? Yes?
12 MR. GUNDERSEN: The experience in Japan
13 two years ago after that large earthquake, so we had
14 a design basis earthquake, which caused a fire. So,
15 you know, it's important that just we have a situation
16 already on the record where a design basis earthquake
17 caused a fire. So that the two are not sort of
18 separate events.
19 Separately, just one last thought on this,
20 the epoxy liner. There's a long industry experience
21 with it. I cannot believe that 50 years experience,
22 as quoted, has had no flaws. And, really, that seems
23 to be out there. I can put this in, and this works
24 flawlessly.
25 While the product may be good, it's a

1 field application on an old pipe. And given that, a
2 more frequent inspection program I think is
3 appropriate along with the issue of monitoring wells
4 as well.
5 CHAIR YOUNG: Thank you.
6 Do the manufacturers' guidance and
7 specifications, whatever you call it, have any -- did
8 they address using it on old surfaces, like this type
9 that would already have a rubber liner? Does it --
10 MR. SPATARO: Yes, Your Honor, absolutely.
11 The product was designed to be used on old piping
12 systems. That's its claim to fame. That's what's
13 given it a niche in the industry that we can use it on
14 systems negating the fact that we have to dig them up
15 and replace them or dig them up and repair them. It
16 saves the user a tremendous amount of money and cost
17 and aggravation and you name it.
18 So yes, that is why it has been used
19 extensively, because it is designed exactly for that,
20 for old pipes.
21 CHAIR YOUNG: And then on the fire issue,
22 did I understand you correctly that the function that
23 it serves, the same function that it normally serves
24 is a cooling function? Is that right?
25 MR. SULLIVAN: That's right. It's what

1 you need to maintain the plant in safe shutdown
2 condition.
3 CHAIR YOUNG: Okay. Why don't we take a
4 lunch break. And when we come back, we will deal with
5 these two exhibits.
6 JUDGE ABRAMSON: Set a time to get back so
7 we can keep moving.
8 CHAIR YOUNG: Right. And in addition to
9 dealing with these two exhibits, if there is any final
10 follow-up on the salt service water. Otherwise we'll
11 move directly to the condensate storage system.
12 It is now about 1:00 o'clock. Come back
13 at 2:00 o'clock. I don't know how fast people can eat
14 or how long it takes to go places.
15 (Whereupon, the foregoing matter was
16 concluded at 12:59 p.m.)
17 CHAIR YOUNG: Back on the record.
18 Mr. Lewis, you have --
19 MR. LEWIS: Shall I identify what I have
20 given you, Judge Young?
21 CHAIR YOUNG: Pardon me?
22 MR. LEWIS: Shall I identify the documents
23 I've given you?
24 CHAIR YOUNG: I'm just trying to make sure
25 which ones --

1 JUDGE ABRAMSON: You should have three, a
2 condition report, a nonconformance report sheet, and
3 the verification. That's it.
4 CHAIR YOUNG: I have three documents.
5 MR. LEWIS: I'll explain them.
6 CHAIR YOUNG: Okay.
7 MR. LEWIS: Are we on the record?
8 CHAIR YOUNG: I was expecting two, that's
9 why.
10 MR. LEWIS: Yes.
11 CHAIR YOUNG: All right, yes, I think
12 we've already gone on the record. So go ahead.
13 MR. LEWIS: I have provided a condition
14 report, the full copy which is four pages, not the two
15 that were previously provided. And included in the
16 pages is a statement that the noted condition is not
17 a condition adverse to quality and therefore will be
18 dispositioned by a nonconformance report so I've also
19 conducted the nonconformance report which actually
20 dispositions this issue for completeness.
21 CHAIR YOUNG: Okay, so you want to combine
22 those two into one exhibit?
23 MR. LEWIS: Yes, if you want the full
24 story on how this issue was resolved?
25 CHAIR YOUNG: Okay, so we'll combine the

1 condition report, and the nonconformance report form
2 which has several pages. Ms. Tebo do you have copies
3 of these?
4 Combine those.
5 THE CLERK: Would you like these entered
6 in as the Applicant's exhibits or the Appellant's
7 Exhibits?
8 JUDGE ABRAMSON: Let's make it Applicant's
9 exhibits and they can refer to them. That works. All
10 you need is the document.
11 CHAIR YOUNG: And they'll be Exhibit 68.
12 We're going to combine them. Do you want to make them
13 two separate ones? Sixty-eight and 69 then. The
14 condition report is 68 and the nonconformance report
15 form that relates to that is 69.
16 MR. LEWIS: And then for the record I've
17 also provided a complete copy of a document that's
18 Report No. AMRM-11, the aging management review of the
19 saltwater service system. This is Revision 1 in and
20 I guess approved November 2, 2007. I note that on
21 page 10 it still has the same statement that Pilgrim
22 Watch was referring to, so this is just the complete
23 copy and it hasn't prevented Pilgrim Watch from
24 referring to the specific statement that Mr. Gundersen
25 was referring to.

1 CHAIR YOUNG: Okay, so it's a more
2 complete form of the earlier exhibit proposed by
3 Pilgrim Watch. There's no differences actually
4 between the relevant pages, between the information on
5 the relevant pages.
6 MR. LEWIS: I would request just with
7 respect to this one statement, since this is an
8 additional document to allow our witnesses just to
9 explain what the statement means.
10 CHAIR YOUNG: The statement that was
11 brought out earlier?
12 MR. LEWIS: Yes, it's the statement on
13 page 10 that says "since the coding does not have a
14 specified life, aging effects are evaluated as if the
15 quality of steel was not coated."
16 JUDGE ABRAMSON: And since we had some
17 uncertainty as to what that meant we should --
18 CHAIR YOUNG: Let's get to that after we
19 get the documents in.
20 So this would be Exhibit 70.
21 (Whereupon, the above-referred
22 to document was marked as
23 Exhibit 70 for identification
24 and was received in evidence.)
25 With regard to Exhibits substituting

1 copies of the photos, do you want to do that and make
2 sure that -- I think we need three copies. Is that
3 right, Ms. Tebo.
4 THE CLERK: I need two.
5 CHAIR YOUNG: Two. It would be helpful to
6 give us also -- if you're going to print out copies.
7 MR. LEWIS: Maybe on the next break I can
8 try and get the color copies of those if --
9 JUDGE ABRAMSON: What next break.
10 MR. LEWIS: Okay.
11 (Laughter.)
12 CHAIR YOUNG: Those can be submitted
13 either today or after the fact. I mean what --
14 obviously, it would be better today. People could
15 look at it, but I presume Pilgrim Watch you sought
16 when you looked at it on the computer, you saw what
17 the original photo looked like on the computer before
18 it was printed out, so there wouldn't be any harm in
19 substituting a better printout of the photo.
20 MS. LAMPERT: No, that would be a great
21 idea.
22 CHAIR YOUNG: Okay, so either today or
23 later --
24 MR. LEWIS: We can just try to see if we
25 can do it right now.

1 CHAIR YOUNG: Okay. So two for the
2 official record and one for each of us and for the
3 rest of the parties, if it's not that difficult. All
4 right, great. So that will be Exhibit --
5 MR. LEWIS: Excuse me?
6 CHAIR YOUNG: That will be Exhibit 70 and
7 I think that takes care of that, so you wanted to
8 explain some of the language in the last one? You
9 wanted to have your expert explain that.
10 MR. COX: The statement, if I could read
11 it here says "since the coding" --
12 CHAIR YOUNG: On page ten?
13 MR. COX: Right, it's on page 10 of 26.
14 It says "since the coating does not have a specified
15 life, aging effects were evaluated as if the carbon
16 steel was not coated."
17 CHAIR YOUNG: And this was how far down,
18 excuse me?
19 MR. COX: It's the first paragraph, starts
20 about the middle of the first, end of the second line
21 of the first paragraph.
22 It's the second sentence on that page.
23 CHAIR YOUNG: "Aging effects that may
24 result in" --
25 MR. COX: No, I'm sorry. It's page 10 of

1 26, the second sentence on that paragraph, starts with
2 "since the coating does not have a specified life" --
3 CHAIR YOUNG: I was looking at the wrong
4 page, thank you.
5 MR. COX: And what that simply means is if
6 we had a specified life of the coating, a guaranteed
7 life, we would have no aging effects. We would have
8 no entries in the aging -- in the license renewal
9 application for that component. We would have none
10 listed as the aging effect. We would have no aging
11 management program listed or required to manage aging
12 effects.
13 What we've done here is since there is no
14 qualified life of the coating we have said that loss
15 of material of that underlying metal is possible, so
16 we have to have an aging management program. The
17 aging management program in this case is actually
18 relying on the coating and the inspections that we do
19 periodically of the coating to prevent the loss of
20 material from that surface.
21 CHAIR YOUNG: Is there any follow up to
22 that?
23 MR. GUNDERSEN: That same quote appeared
24 in several other Entergy documents, so this is not a
25 stand-alone quote. It has woven its way through

1 several -- does it change anything of that quote if
2 repeated? I agree with them that we're acknowledging
3 that there's no qualified life and I think that the
4 emphasis is on qualified which I get back to that
5 environmental qualification from before.
6 Your Honor, I did find the citation. It's
7 10 CFR 50, Appendix B, paragraph 2 talks about the
8 inspection frequency being related to the qualified
9 life of the component.
10 I don't believe the liner is safety. The
11 pipe is safety related, but the liner is not, so I
12 keep coming back to it's nice that the liner is there,
13 but the real goal is to make sure that that carbon
14 steel pipe retains its integrity and doesn't collapse
15 and so between looking at it from the inside and a
16 monitoring program from the outside, it's the pipe
17 that's the issue, not the liner.
18 CHAIR YOUNG: Is the second paragraph
19 talking about quality assurance?
20 MR. GUNDERSEN: 10 CFR 50(b)(II), I think.
21 CHAIR YOUNG: Roman numeral two?
22 MR. GUNDERSEN: Yes.
23 CHAIR YOUNG: Okay, so section two, not
24 paragraph two.
25 MR. GUNDERSEN: Yes. Yes.

1 CHAIR YOUNG: Also relating to quality
2 assurance program.
3 MR. GUNDERSEN: I don't have it in front
4 of me. I'm sorry, I don't have what you're reading in
5 front of me.
6 CHAIR YOUNG: The citation that you were
7 giving.
8 MR. GUNDERSEN: Yes.
9 CHAIR YOUNG: Appendix B, Section 2 --
10 MR. GUNDERSEN: Yes.
11 CHAIR YOUNG: And the title of that is
12 quality assurance program?
13 MR. GUNDERSEN: And I believe that that's
14 where the life cycle -- the testing comes in. In my
15 mind that's the first citation I could think of that
16 addressed the issue you brought up earlier which was
17 the frequency of testing being related to the
18 component degradation.
19 CHAIR YOUNG: Any other follow up?
20 MS. LAMPERT: Do you want those exhibits
21 he referred to or are you satisfied with one, his
22 statement?
23 CHAIR YOUNG: What exhibit?
24 MS. LAMPERT: He said that we had other
25 documents like the one produced that said the same

1 thing about the liner not being -- what do you call it
2 -- as specified.
3 JUDGE COLE: Guaranteed service life.
4 MS. LAMPERT: Yes, guaranteed service life
5 and we do like to submit those at this time as opposed
6 to just relying on the fact that he said that there
7 are other statements.
8 CHAIR YOUNG: I'm not going to ask for
9 anything. If you want to propose something --
10 MS. LAMPERT: I would like to propose --
11 CHAIR YOUNG: Do so and then we'll get
12 responses to that.
13 MS. LAMPERT: I would like to propose, if
14 I may, three other documents that were produced by
15 Entergy that, in essence, say the coatings have not
16 been specified.
17 JUDGE ABRAMSON: Do they all relate to the
18 same piping?
19 MS. LAMPERT: Yes, I believe so.
20 JUDGE ABRAMSON: And other than repetition
21 of the point, do they add any information to us, Mr.
22 Gundersen?
23 MR. GUNDERSEN: No, as I said, it's a
24 repetition of the point. It's repeated that same
25 exact same concept, can we just --

1 MR. LEWIS: I don't know if they are, but
2 I would suggest they're redundant. We've admitted
3 this statement into evidence and it's there. And so
4 I suspect --
5 JUDGE COLE: The point was taken.
6 MR. LEWIS: Probably drafts of the same
7 document.
8 CHAIR YOUNG: Is there any reason to
9 submit them other than to just indicate that there are
10 three more that say the same thing?
11 MS. LAMPERT: No, I don't believe there
12 are.
13 CHAIR YOUNG: So the record --
14 MS. LAMPERT: Just to have the record show
15 that Entergy had provided any disclosures, three other
16 documents that say the same thing.
17 JUDGE ABRAMSON: With respect to the same
18 pipe.
19 MS. LAMPERT: With respect to the same
20 pipe.
21 CHAIR YOUNG: All right. Is there
22 anything else on this salt service water system that
23 any party would like to follow up on, anything that
24 we've overlooked?
25 MS. UTTAL: Did you want to say --

1 DR. DAVIS: We just looked at that section
2 of Appendix B and we couldn't --
3 CHAIR YOUNG: We can't hear him.
4 JUDGE ABRAMSON: Get close, Mr. Davis, Dr.
5 Davis.
6 CHAIR YOUNG: Project, pretend you're an
7 actor.
8 JUDGE ABRAMSON: Sing, get that thing
9 under your nose.
10 DR. DAVIS: We couldn't find anything in
11 that paragraph that mentioned qualification of
12 equipment.
13 JUDGE ABRAMSON: So perhaps you can get us
14 another more precise reference.
15 DR. DAVIS: Yes.
16 CHAIR YOUNG: It's only a one-paragraph
17 section. If it's Appendix B, Section II quality
18 assurance program, so it says what it says.
19 MR. GUNDERSEN: I'm sorry, at a break or
20 something I'll just skim through it. I apologize.
21 CHAIR YOUNG: Okay. Then anything else on
22 the saltwater, salt service water? Judge Cole?
23 JUDGE COLE: Yes. Just a couple of
24 questions and comments. You didn't say anything about
25 the intake system. All this was about the discharge

1 system and in the intake system the pipes were
2 replaced in 1993, is that correct?
3 MR. SULLIVAN: That's correct.
4 JUDGE COLE: Why were they replaced?
5 MR. SULLIVAN: They were replaced because
6 of -- to address service life of the pipes. They had
7 reached the end of their service life and they were
8 replaced with titanium piping as stated previously.
9 JUDGE ABRAMSON: What was the prior pipe?
10 MR. SULLIVAN: The prior pipe was carbon
11 steel rubber-lined.
12 CHAIR YOUNG: What's the last word?
13 MR. SULLIVAN: Carbon steel rubber-lined.
14 CHAIR YOUNG: Rubber-lined.
15 JUDGE COLE: So the same as in the other
16 system, same as in the discharge pipes?
17 MR. SULLIVAN: That's correct.
18 JUDGE COLE: And there were two pipes.
19 They were about the same size as the discharge pipes?
20 MR. SULLIVAN: About the same size. They
21 have to -- the flow going in has to equal the flow
22 going out, so they might have been a little bigger.
23 JUDGE COLE: So their service life was
24 some time just pre-1972 to 1993, is that correct?
25 MR. SULLIVAN: That's correct.

1 JUDGE COLE: So about what, 22 years, 21
2 years?
3 MR. SULLIVAN: That's correct.
4 JUDGE COLE: And the expect life is, as
5 you said before, 20 years?
6 MR. SULLIVAN: Approximately 20 years.
7 JUDGE COLE: What problem did you observe
8 in those pipes at the time that they were replaced, do
9 you recall?
10 MR. SULLIVAN: I don't recall.
11 JUDGE COLE: You were responsible for
12 let's see -- Mr. Woods, right?
13 MR. WOOD: Yes.
14 JUDGE COLE: You were responsible for the
15 work on the titanium pipe that replaced that, correct?
16 MR. WOOD: Yes, I was one of the field
17 engineers on site when the titanium pipe replacement
18 was going on.
19 JUDGE COLE: And why did they select
20 titanium?
21 MR. WOOD: I would say because of its
22 inherent corrosion-resistant properties. I wasn't on
23 the design team. I was on the installation team.
24 JUDGE COLE: All right, sir. Did you
25 observe how they installed and prepared that pipe?

1 MR. WOOD: Yes.

2 JUDGE COLE: And what did they do?

3 MR. WOOD: The pipe was brought in,
4 flanged, sections, it was coated in the field
5 externally with a coating per specification M306 which
6 you do an inspection to make sure you have a good base
7 metal, clean it up, degrease it and prime it with a
8 primer and then a field application would be field
9 wrapped with coal tar tape, spiral tape the entire
10 length. When that was complete, you would do a
11 holiday test, looking for any voids in the wrap with
12 a high voltage tester which would provide an arc that
13 you could see, a bright arc, also hear the arc snap.

14 When that was done, it would be placed in
15 the trench, bolted together and then the same primer,
16 cleaning and primer and tape would be applied over
17 each joint between pipe sections. And again, after
18 that was done, it would be tested in the trench to
19 make sure there were no holidays or voids.

20 JUDGE COLE: What sort of preparations did
21 they make in the trench prior to putting the pipe in
22 it?

23 MR. WOOD: The trench would be prepped
24 with engineered fill material at the base and
25 compacted. The pipe would be set down in place and

1 then engineered fill would be placed, clean sand or
2 fill would be placed around the pipe, compacted, and
3 then at six-inch lifts the engineered fill would also
4 be compared and every other lift was tested for
5 compaction.
6 JUDGE COLE: Did they use that procedure
7 for all the pipes that were installed in the salt
8 service water system?
9 MR. WOOD: To my knowledge, yes.
10 JUDGE COLE: And I noticed that all of the
11 pipes in the systems that we're concerned with, the
12 salt service system and the condenser service water
13 are located seven to ten feet below the service
14 system. Is that correct?
15 MR. WOOD: That is correct.
16 JUDGE COLE: And where is the ground water
17 level with respect to that?
18 MR. WOOD: The ground water level is
19 approximately 17 feet below the surface.
20 JUDGE COLE: Is that significant with
21 respect to assisting in minimizing corrosion?
22 MR. WOOD: Yes.
23 JUDGE COLE: How is that?
24 MR. SPATARO: As you realize, the action
25 of corrosion is electrochemical in nature and so I

1 have to have an electrolyte. The piping is buried at
2 a depth of approximately seven to ten feet and the
3 water table is 17 feet, appreciably lower than the
4 piping itself.
5 There is no way that the piping could be
6 immersed in the ground water, thereby creating a
7 situation where you would have a corrosion cell
8 generated for any length of time.
9 JUDGE COLE: Is the ground water table
10 artificially lower or was that just where it stayed
11 with the drainage system you had?
12 In other words, do you have a pumping
13 system to keep the ground water level?
14 MR. WOOD: No, we do not have a pumping
15 system.
16 JUDGE COLE: So it's gravity drained.
17 MR. WOOD: That would be natural, that's
18 correct.
19 JUDGE COLE: I have no further questions
20 on the salt service water system.
21 Well, just one. The intake, you have a
22 traveling screen at the intake. Is that correct?
23 MR. WOOD: Yes, that's correct.
24 JUDGE COLE: What is the size of the
25 opening in that screen?

1 MR. WOOD: Three-eighths mesh.

2 JUDGE COLE: And how is it cleaned?

3 MR. WOOD: It's a traveling screen that

4 rotates and then there's water nozzle sprays that

5 spray on the screen to clean the debris off.

6 JUDGE COLE: Have you had any problems

7 with that clogging, because it would be a safety

8 issue, if you're not letting any water in.

9 MR. WOOD: We have had incidents where the

10 screens have become clogged with debris. We have

11 alarm response procedures and off-normal procedures

12 that provide specific guidance to the operators on the

13 actions to take, if we do have intake structure

14 clogging.

15 JUDGE COLE: How often do you have those

16 kinds of problems?

17 MR. WOOD: In my experience, going back to

18 when I was licensed as an SRO, until present day,

19 twice.

20 JUDGE COLE: How many years ago were you

21 licensed as an SRO?

22 CHAIR YOUNG: Senior Reactor Operators?

23 MR. WOOD: Yes. That goes back to 1996.

24 JUDGE COLE: All right, sir. Thank you.

25 CHAIR YOUNG: Just a couple and then we'll

1 get over to you. Traveling screen simply means that
2 it rotates?
3 MR. WOOD: Yes.
4 CHAIR YOUNG: Okay, and holiday test, that
5 is a test that looks for voids in the coating? Is
6 that all that means or is there some other --
7 MR. WOOD: Yes, it looks for voids in the
8 coating. Areas that wouldn't be covered are pinholes
9 or things of that nature.
10 CHAIR YOUNG: Does it refer to any tests
11 that does that or is it a specific method?
12 MR. WOOD: It's a specific method using
13 high voltage.
14 CHAIR YOUNG: You had -- go ahead.
15 JUDGE COLE: You were talking about the
16 packing around the pipe and you used a cold tar tape,
17 35 millimeters, the testimony indicated? A 7
18 millimeter film backing and 28 millimeters of
19 adhesive, do you mean mill or did you mean
20 millimeters?
21 MR. WOOD: I believe that's mills.
22 JUDGE COLE: Okay.
23 CHAIR YOUNG: So that's 7/28 thousandths
24 of an inch.
25 JUDGE COLE: Twenty-eight mill, okay, not

1 28 millimeters of adhesive. All right, thank you.

2 CHAIR YOUNG: All right, actually I saw --

3 go ahead.

4 MR. GUNDERSEN: Thank you. It's been

5 suggested in rebuttal to my testimony that I recommend

6 ripping up the yard and doing an external visual exam

7 of all of the service water pipe. I reread my

8 testimony and I haven't suggested that. I think it's

9 probably not even safe because you always run the risk

10 of hitting the pipe and causing damage.

11 You can in places along the pipe apply

12 cathodic protection. You don't have to do the whole

13 pipe, go down and put appropriate anodes and cathodes

14 with a rectifier in the building that sends a DC

15 current out and it doesn't require ripping up the

16 whole pipe which would cathodically protect that pipe.

17 CHAIR YOUNG: When you say cathodic, could

18 you explain that a little bit more? Are you talking

19 about a test or --

20 MR. GUNDERSEN: Well, boats have it.

21 Frequently, you'll put a little hunk of zinc on the

22 back of your motor on a boat and --

23 JUDGE COLE: A sacrificial anode?

24 MR. GUNDERSEN: Yes, it's a sacrificial

25 component that attracts the electrical ions as opposed

1 to having them attract the carbon steel pipe. And
2 you've set up a potential between a plus and a minus
3 and it just -- it's kind of like inviting them to one
4 location as opposed to having them attach themselves
5 to the --
6 CHAIR YOUNG: Like a lightning rod?
7 MR. GUNDERSEN: The opposite of a lighting
8 rod, yes. Yes. It's like an anti-lighting rod,
9 right. But the British Navy invented it in the 1700s
10 to protect the copper lining on their boats, and
11 although it's an old technique. But the modern
12 technique would be to apply and GALL suggests that
13 cathodic protection is a good idea for this type of
14 pipe, especially carbon steel, that at intervals,
15 depending on the layout and my guess would be every 30
16 or 40 feet, you go down and apply and there's only 200
17 feet, so maybe 10 small holes where you would apply
18 the cathodic protection and you -- that would go a
19 long way to assuring that you don't get rust from the
20 inside -- from the outside in.
21 I mean this morning we talked about coming
22 from the inside out, but should abrasion affect that
23 outside liner, GALL suggests that cathodic protection
24 is a good idea and I would agree. If it were a new
25 plant, you would cathodically protect the whole pipe

1 and I'm not suggesting that, but you can backfit --
2 it's called an impressed current cathodic protection
3 system by putting anodes and cathodes along the pipe
4 at intervals of about 40 feet so maybe five on each
5 pipe would go a long way to protecting the pipe from
6 outside in.
7 I was speaking to Dr. Ahfield at break and
8 he also felt that we could put monitoring wells on the
9 outside and should saltwater, because the water table
10 is so low, if the pipe -- and the pipe has saltwater
11 in it, if the pipe were to leak the conductivity would
12 change dramatically because it is salt water and Dr.
13 Ahfield felt you could pick that up in a simple test
14 in a pretty simple monitoring well.
15 Can I pass it down?
16 CHAIR YOUNG: But before you pass it down,
17 let me just ask one question. I had written in my
18 notes a reference to GALL report, Section 11M-28. Is
19 that related to this or to the condenser? Is that
20 what you were just referring to?
21 MR. GUNDERSEN: Yes. We have it here, but
22 yes. May I put it forward? It's that -- it is --
23 that's the reference, yes.
24 CHAIR YOUNG: To the cathodic protection?
25 MR. GUNDERSEN: Yes.

1 CHAIR YOUNG: Any objection?

2 JUDGE ABRAMSON: Isn't the whole GALL

3 report in evidence?

4 MS. LAMPERT: No. May I have the

5 opportunity to present it as an exhibit?

6 CHAIR YOUNG: Any objection to that?

7 MR. LEWIS: No.

8 CHAIR YOUNG: No objection, okay.

9 And that will be official exhibit 71, I

10 think.

11 (Pause.)

12 (Whereupon, the above-referred

13 to document was marked as

14 Exhibit 71 for identification

15 and was received in evidence.)

16 All right, are you Dr. or Mr.? I got that

17 wrong this morning. You're Mr. --

18 DR. AHFIELD: I'm Dr. David Ahfield.

19 MR. LEWIS: May I ask for clarification?

20 I'm not sure Dr. Ahfield is responding to any of the

21 questions -- is this just new testimony or is this in

22 response to something somebody has raised as an issue?

23 CHAIR YOUNG: We asked a question if there

24 was any follow up or anything that we might have

25 overlooked with regard to the saltwater service system

1 and I believe this was in response to that, following
2 up on --
3 MR. LEWIS: What I heard earlier -- I
4 believe before the break was questions directed to Mr.
5 Gundersen regarding suggestions he might have perhaps,
6 if that's not too strong a way to put it, for
7 additional inspections or different techniques and so
8 on. So following up in that spirit, I'd like to just
9 interject that monitoring wells are another way to
10 determine if leaking is occurring and then, of course,
11 if you determine that, then you have an incentive to
12 fix the leak. And we heard that there's a water table
13 beneath this particular piping system. I think Dr.
14 Cole's questions were directed to the intake pipe.
15 I'm not sure about the out-take pipe.
16 JUDGE COLE: I think they said they're all
17 buried seven to ten feet underground.
18 DR. AHFIELD: Okay.
19 JUDGE COLE: And the groundwater table is
20 at 17 feet below the surface.
21 DR. AHFIELD: Correct, okay, and that
22 probably varies over the site, although we have very
23 little data on the groundwater table available to us
24 anyway and probably varies seasonally. of course.
25 In any case, that is fresh water in all

1 likelihood. And in fact, we have a limited amount of
2 sampling data that indicates that it is fresh water.
3 So if you had a leak of salt water that mixed with
4 that ground water, you would be able to detect that
5 quite readily and inexpensively with a set of
6 strategically placed monitoring wells.
7 And that sampling could be done at a
8 typical installation, do samplings of this sort
9 quarterly, that is four times a year, so -- and if
10 we're looking at a situation of a leaking pipe with
11 water traveling through, unsaturated soils to the
12 water table and then migrating laterally, being picked
13 up by a monitoring well, you could get detections
14 again if they're well placed within weeks or months
15 after initiation of the leak, depending on rates of
16 groundwater flow and other factors. And again, we
17 don't have that much information about the site to be
18 more specific than that.
19 That was my comment at this point.
20 CHAIR YOUNG: I don't know if either of my
21 colleagues want to ask this, but can you speak to how
22 that would be related to the timing of inspections and
23 the rate at which you could have a leak that would
24 ultimately compromise the pipes so that if you had an
25 earthquake it would cause the pipe to crumple or is

1 that outside your area?

2 DR. AHFIELD: Yes, that's edging outside

3 my area. That is the behavior of the rate at which

4 the corrosion occurs in the pipe is outside my area.

5 But if a small hole were to be initiated

6 by some mechanism and then grow at some rate, the

7 notion is that the groundwater monitoring wells would

8 -- if properly placed again and monitored with some --

9 monitored with reasonable frequency, would pick up a

10 signal from that leak fairly soon after it was

11 initiated.

12 CHAIR YOUNG: So that then there could be

13 an inspection prior --

14 DR. AHFIELD: -- within say months or a

15 year on that time scale.

16 CHAIR YOUNG: Okay. Any follow up to

17 that?

18 MR. LEWIS: I have two follow-up

19 questions, generally; one on the new exhibit and one

20 just to make sure that some testimony before relates

21 what Judge Cole asked is complete, if I could ask

22 those questions.

23 JUDGE COLE: Please.

24 MR. LEWIS: Gentlemen, Judge Cole asked

25 you to describe the process for backfilling the hole

1 where the saltwater, salt service water piping was
2 installed and you discussed putting in the soil and
3 compacting. Isn't it also true that that entire area
4 above the intake and discharge piping is blacktopped?
5 MR. SULLIVAN: That's correct.
6 MR. LEWIS: And that black top was
7 restored after the piping was installed?
8 MR. SULLIVAN: That's also correct.
9 MR. LEWIS: And then Mr. Cox, Pilgrim
10 Watch has introduced this section of the GALL report.
11 Could you explain how this --
12 CHAIR YOUNG: Can everyone hear?
13 MR. LEWIS: Mr. Cox, Pilgrim Watch has
14 introduced a section of the GALL Report, Section 11-
15 M28, buried pipes and tank surveillance. Could you
16 explain how this program relates with the other GALL
17 guidance on the buried pipe and tanking program?
18 MR. COX: The M-28 program is one of the
19 aging management programs listed in Chapter 11, along
20 with the M-34 program which is the one that we have
21 credited for the Pilgrim license renewal application.
22 If you go to the tables in the GALL Report in the
23 earlier chapters, for buried piping they will refer to
24 one of -- either one of these two programs as an
25 acceptable method to manage the aging effects on

1 buried pipe.

2 CHAIR YOUNG: They're alternatives.

3 MR. COX: They are alternatives. It is

4 not a requirement that you have both. It says either

5 one is acceptable.

6 CHAIR YOUNG: Is there any discussion on

7 recommending both would be better than either one or

8 is it just simply an alternative?

9 MR. COX: I believe it's just an item in

10 the table that says you can use M-28 or M-34.

11 DR. DAVIS: I wrote both of those

12 programs, so I have some familiarity with them.

13 JUDGE ABRAMSON: You want to tell us what

14 they mean?

15 CHAIR YOUNG: Speak up, please.

16 JUDGE ABRAMSON: And get closer again.

17 DR. DAVIS: Okay. M-28 I wrote before we

18 started Calvert Cliffs, the first plant. And they

19 objected very strongly to using that program. And

20 they said the reason that they objected was in their

21 rectifiers would be safety-related --

22 CHAIR YOUNG: Explain rectifiers before

23 you go on.

24 DR. DAVIS: It's a battery -- like a

25 battery. It supplies a DC charge to the pipe through

1 an anode. There's no cathodes involved. It's just
2 anodes. And you probably only need one.
3 JUDGE COLE: But they would still call
4 that cathodic protection?
5 DR. DAVIS: Yes, and what you're doing
6 basically is you're setting up so you're like plating
7 the pipe so that iron cannot go into solution
8 thermodynamically. It can only plate, if there's any
9 iron -- it's possible, but it would stop corrosion.
10 They were concerned that if they used a
11 rectifier or put the rectifier in a safety-related and
12 it went down for some reason they would go into a
13 limited condition of operation and they would have to
14 shut down the plant because the rectifier failed.
15 JUDGE COLE: And the leads, too, right?
16 DR. DAVIS: Right, right. So we
17 negotiated with the NEI on what different program to
18 come up with and I interviewed the people in the
19 industry and I said how often do you normally look at
20 your buried piping? How often do you do maintenance?
21 And they said about every five years on average. I
22 talked to quite a few people so I wrote the alternate
23 program, M-34 and allowed them to do the visual
24 inspection, rather than using cathodic protection.
25 And I might also add that cathodic protection is used

1 very extensively, particularly on cross-country
2 pipelines, oil and gas, slurry, all different kinds.
3 It's fairly easy to apply cathodic protection in that
4 situation.
5 To backfit cathodic protection on a
6 nuclear power plant is a very dangerous practice
7 because of something that we call stray current
8 corrosion. What happens is you have a complete
9 circuit from the rectifier sends the current to the
10 anode, the anode sends it to the pipe, and then it's
11 got to somehow return back to the rectifier. And it
12 likes to take the path of least resistance, so if it
13 sees another pipe in the area it will go to that pipe
14 and it will put a hole right through that pipe in a
15 matter of weeks.
16 And so what you have to do when you
17 originally design the cathodic protection system, you
18 have to take all that into consideration. You have to
19 know where every single pipe is on your facility and
20 then you have to bond those together and that's
21 extremely difficult to do --
22 CHAIR YOUNG: Bond what together?
23 DR. DAVIS: You have to have an electrical
24 bond between the pipes so that the current won't go
25 through the soil and cause corrosion. It will go

1 through the lead. So to backfit and use cathodic
2 protection is -- can be extremely dangerous. You have
3 to be extremely careful when you do that.
4 So to date, nobody has used M-28.
5 Everybody has used some alternative program and most
6 of them have used M-34.
7 JUDGE COLE: Sot hat's why they're not
8 using cathodic protection at this plant?
9 DR. DAVIS: They're not taking credit for
10 it, if they are using it, and I don't believe they're
11 using it.
12 CHAIR YOUNG: Okay. Anything further?
13 All right, then let's -- what's your
14 question?
15 MS. LAMPERT: I noticed that Judge
16 Abramson said in regard to the one time inspection
17 program that it would occur in the next four years.
18 My understanding of reading the aging management
19 program requirements is that a one-time inspection can
20 occur, will occur once in the ten-year period. That
21 would be between 2002 and 2012. And so I wanted to
22 have assurance, and then I'll follow up on that that
23 they're not crediting inspections that they did in
24 2002, 2003, 2004, and also to bring up the point if
25 they are doing their one-time inspection in the next

1 four years, that would be after you made the decision
2 on whether the aging management program should be
3 supplemented, so you would not have had the benefit of
4 looking at how thorough the inspection was, what the
5 results of that inspection were to see whether it
6 would serve as a more current baseline to judge
7 whether there should be more frequent inspections or
8 what have you.
9 And also, it disallows any public input
10 really on the process because the deal would have been
11 done, so to speak, before we had the opportunity to
12 look at what they inspected and what the results were,
13 if you understand what I'm saying.
14 So I'd like to know (a) when they're going
15 to do these or have they, what's been credited and how
16 your role really fits into this?
17 CHAIR YOUNG: First, can you address the
18 timing issues and then to the extent you can answer
19 the remainder of it, go ahead. that may be also
20 something for argument in your ultimate proposed
21 findings of fact and conclusions of law. But go
22 ahead.
23 MR. SULLIVAN: There were a lot of
24 questions there, so I'd like to go back and just
25 clarify some of the programs because I think we're

1 crossing boundaries here and confusing different
2 programs.
3 The inspections on the interior of the
4 pipe were put in place -- that requirement was put in
5 place well in advance of any aging management program.
6 Those requirements were put in place when we put the
7 cured-in-place pipe liner inside those piping systems.
8 So that question of when did we decide to do it, is it
9 adequate? We always have the responsibility to ensure
10 the safety and safe operation of the plant.
11 So in ten years from when those systems
12 went in, they'll be inspected and for one piping
13 system it's in 2011 and one it is after the extended
14 license period or after the initial license period in
15 2013, assuming that the license renewal gets approved.
16 Now I'm not sure I understood any of the
17 other questions that were in there, so if you could
18 ask those again.
19 CHAIR YOUNG: Did that respond to the
20 questions on timing?
21 MS. LAMPERT: Okay, so could you repeat
22 exactly what date you're inspecting what and if it's
23 appropriate and you feel it's relevant and what are
24 you inspecting? Are you looking at welds? Are you
25 looking at a part of a spool or what percent? What is

1 your plant? What are you going to look at on what
2 date? That's -- my linear mind is trying to get this
3 focused.
4 CHAIR YOUNG: To the extent you can
5 clarify, go ahead.
6 MR. SULLIVAN: When you say one-time
7 inspection, we do a one-time inspection to verify the
8 thickness of the chemistry program. That would be on
9 the end side of the condensate piping. It really is
10 not applicable to the salt service water piping. We
11 do the --
12 CHAIR YOUNG: So anything that would be
13 called the one-time inspection is not related to the
14 salt service water, is that right?
15 MR. SULLIVAN: That's correct.
16 MS. LAMPERT: So you won't inspect --
17 CHAIR YOUNG: So the inspection for the
18 salt service water --
19 MR. COX: The external surfaces of the
20 salt service water system are subject to the buried
21 piping and tanks inspection program and that's the
22 inspection that will be done prior to entering the
23 period of extended operations, between now and 2012.
24 And that inspection is intended to verify the general
25 condition that the piping is coated the same on all

1 portions of it, exposed to the same environments so
2 that is intended to be a sample inspection that is
3 representative of all of the coatings on the buried
4 piping.
5 JUDGE COLE: That's for the external?
6 MR. COX: That's for the external.
7 JUDGE COLE: Of the SSW system.
8 MR. COX: That's correct.
9 JUDGE COLE: Now what about the internal?
10 I think what we heard is that you've put this epoxy
11 coating in. And you agreed at that point under your
12 on-going operation maintenance programs that at the
13 ten-year point you would inspect those from the
14 inside, with a visual inspection. Those two dates are
15 2011 and 2013 for the two respective loops. Is that
16 correct?
17 MR. COX: That's correct.
18 CHAIR YOUNG: And then your question that
19 I think probably goes more to argument to us in your--
20 MS. LAMPERT: Yes, I think it does. I was
21 just bringing that point forward because it wasn't
22 clear for the external, the required external
23 inspection in the ten years prior whether it could
24 occur in 2002, 2003, 2004, and then the concern that
25 the required external inspection in the first ten

1 years could be in 2019, so you could conceivably have
2 a long period of time or you could have a short period
3 of time.
4 JUDGE ABRAMSON: Let's try to tie it down.
5 CHAIR YOUNG: Plese.
6 JUDGE ABRAMSON: You're doing external
7 inspection on the salt water pipes in what years?
8 MR. COX: We are doing an inspection one
9 time between now and 2012 and we're doing a second
10 inspection during the first ten years, the period of
11 extended operation, those are between the years 2012
12 and 2022.
13 JUDGE ABRAMSON: So could it be you could
14 do the one-time inspection now and do the other one in
15 2022? It could be that long?
16 MR. COX: That's correct and we have no
17 plans to take credit for any inspections that were
18 done in 2003 to say that was the first inspection
19 within the first ten-year period.
20 JUDGE ABRAMSON: Right.
21 CHAIR YOUNG: All right, are we now
22 finished with the salt water service system?
23 Okay, then we'll sort of switch over to
24 another topic and Judge Abramson, do you want to
25 start?

1 JUDGE ABRAMSON: Let's now take the same
2 process through the condensate storage system buried
3 pipes.
4 I'm going to start by looking at the
5 responses of the Applicant in their February 11th
6 filing responding to our particular questions.
7 I'd like you to elaborate a little bit on
8 your response to question C. We asked what's the
9 smallest leakage rate that could reasonably expect to
10 challenge the ability of the CSS system piping to fail
11 its intended safety function as relevant for license
12 renewal?
13 And the response was and I think this, to
14 me, is key --
15 CHAIR YOUNG: What page are you one?
16 JUDGE ABRAMSON: I'm on page three.
17 CHAIR YOUNG: Three, okay.
18 JUDGE ABRAMSON: Page three.
19 CHAIR YOUNG: We're talking about the
20 February 11th --
21 JUDGE ABRAMSON: February 11th responses.
22 CHAIR YOUNG: Page three, response C.
23 JUDGE ABRAMSON: Okay. And your first
24 comment was that at the outset no amount or rate of
25 leakage from the CSS buried piping could challenge the

1 ability of the high pressure coolant injection in the
2 RCIC system to perform their intended functions.
3 Would you elaborate on that for us? What
4 I'm trying to understand is are you telling us that
5 those buried pipes are not, in fact, within the scope
6 because they're not ones that are required to be
7 operable under 54.4?
8 MR. SULLIVAN: Yes, sir.
9 MR. COX: Let me clarify that a little
10 bit. The scoping that we did for the license renewal
11 is done on a system basis. The reason we included the
12 CSS system is because of the connection not in the
13 buried piping, but in the reactor building where it
14 connects to the HPCI and the RCIC systems. That
15 section of the CSS piping could be relied upon to
16 provide seismic support to the safety-related systems.
17 So that's the reason it was included, not because of
18 anything that the buried section of piping - -not
19 because of any function performed by the buried
20 piping.
21 It was done at a system level so the
22 system is in scope. That doesn't necessarily mean
23 that each segment of piping performs an intended
24 function and that is the case for the buried piping.
25 It does not perform an intended function.

1 JUDGE ABRAMSON: So the bottom line here
2 is neither one of those pipes, buried piping systems
3 is within the scope of this proceeding, is that right?
4 MR. COX: Again, we said the systems run
5 the scope of license renewal and they contain
6 radioactive liquid, so from that standpoint, one could
7 say that they are within the scope of this proceeding.
8 JUDGE ABRAMSON: Well, help me through
9 54.4 then. So you're saying the system itself is
10 relied upon to remain functional because a piece of
11 the piping is relied upon to provide structural
12 support during seismic event?
13 MR. COX: That's correct.
14 JUDGE COLE: Is either of the buried pipes
15 relied upon in any way for this series of events that
16 are described in 54.4?
17 MR. COX: No, it is not.
18 CHAIR YOUNG: Isn't there some kind of
19 backup or redundancy issue here? Is this related to
20 the TORUS being the source of the water for the --
21 just for the record and everyone that's here, RCIC is
22 reactor core isolation cooling and the HPIC is high
23 pressure coolant injection system.
24 MR. SULLIVAN: Each one of those systems
25 has a water supply from the condensate storage tank.

1 The condensate storage tank is a nonsafety-related
2 structure. The piping that runs from there to the
3 reactor building in our auxiliary bay is not relied
4 upon for those systems to operate. Those systems have
5 isolation valves that separate that water supply from
6 the TORUS and automatic valves, motor operated valves
7 that will be opened in order to have sufficient water
8 supply to meet the intended functions of those
9 systems.
10 CHAIR YOUNG: Okay, I guess I'm a little
11 confused now.
12 I thought that the TORUS served a backup
13 function to the condensate storage system water. Did
14 I get that backwards or --
15 MR. COX: I think the terminology that
16 we've used is that the preferred source is the
17 condensate storage system. That's typically a higher
18 quality of water so just for long-term cleanliness of
19 the system, we prefer to use that source.
20 CHAIR YOUNG: Right, I remember your
21 testimony in that.
22 MR. COX: The primary source or the
23 assured source, the source that you rely on in the
24 accident is the TORUS. It's safety related. It's
25 seismically qualified. The condensate storage tank

1 itself, I'm not even talking about the piping, but the
2 condensate storage tank itself is non-seismic, so it's
3 not available to you in the seismic event.
4 CHAIR YOUNG: So the reason you don't
5 count on it is not because - -it's a primary source
6 and the TORUS is secondary. And I may not be using
7 the right terminology here, but just from my
8 perspective. You don't count on it because it doesn't
9 have the structural characteristics that would allow
10 that to be used?
11 JUDGE ABRAMSON: It's not safety
12 qualified.
13 MR. COX: Right, right. We go by
14 preferred source and assured source.
15 JUDGE ABRAMSON: So if we understand this
16 correctly, the assured source is the one that's safety
17 qualified and you're entitled to rely on it for your
18 safety analysis in these events and that is the TORUS
19 in this case.
20 MR. COX: That's correct.
21 JUDGE ABRAMSON: So neither of these pipes
22 is relevant for that analysis?
23 MR. COX: That's correct.
24 CHAIR YOUNG: So you use them -- and the
25 reason you use them is because the water in them is

1 higher quality water, but in the event of a safety --
2 a severe accident, the safety source that you rely on
3 is the TORUS.
4 MR. COX: That's correct.
5 CHAIR YOUNG: And in that event if
6 something happened is there -- is the condensate
7 storage system a back up to it or --
8 MR. SULLIVAN: No, the condensate storage
9 tank is assumed to go away in a seismic event.
10 CHAIR YOUNG: So the TORUS is the --
11 MR. SULLIVAN: Is the source of water.
12 CHAIR YOUNG: Okay.
13 MR. SULLIVAN: That's correct.
14 JUDGE COLE: So the condenser storage
15 system has no safety function?
16 MR. SULLIVAN: That's correct.
17 JUDGE COLE: And there's only one pipe,
18 isn't there?
19 MR. SULLIVAN: There was one pipe that
20 runs down and then it branches off.
21 JUDGE COLE: Sixty-four feet of 18-inch
22 pipe?
23 MR. SULLIVAN: That sounds right.
24 JUDGE ABRAMSON: Plus or minus.
25 CHAIR YOUNG: And there is no possibility

1 of radioactive water in the TORUS?

2 JUDGE ABRAMSON: It's not a buried pipe.

3 CHAIR YOUNG: It's not buried, okay.

4 JUDGE ABRAMSON: Those are my questions on

5 this.

6 JUDGE COLE: There is radioactivity in the

7 condenser storage system. What is the source of that

8 radioactivity?

9 MR. SULLIVAN: The source of that

10 radioactivity is that serves as a makeup supply of

11 water to -- for our steam cycle and the water in our

12 steam cycle runs through the reactor, becomes

13 contaminated and then the CST serves, condensate

14 storage tank, and it serves as a make up in storage

15 volume.

16 JUDGE COLE: And what are the principal

17 isotopes involved, radioisotopes?

18 MR. SULLIVAN: I can't answer that. It

19 might be in there.

20 JUDGE COLE: But if it's pretty high

21 quality water, would it be tritium and maybe nitrogen-

22 16?

23 MR. COX: It is pretty high quality water

24 from the standpoint it's clean, it's run through

25 demineralizers. It's the water that's used in the

1 primary system and from that standpoint it's -- the
2 corrosive items, it could cause cracking and corrosion
3 are minimized by the water treatment systems that
4 apply to that.
5 JUDGE COLE: How hot is it?
6 MR. COX: How hot temperature wise?
7 JUDGE COLE: Radioactivity wise.
8 JUDGE ABRAMSON: You would not want to
9 drink it or shower in it.
10 MR. SULLIVAN: We will have to consult
11 with some people in the audience and answer that
12 question after a break.
13 JUDGE COLE: Okay, I just wonder, I mean -
14 - most of it is buried below, but you've got this
15 275,000 gallon tanks, two of them there.
16 By the way, aren't they partially
17 submerged?
18 MR. SULLIVAN: No, they're not.
19 JUDGE COLE: Well, if the pipe is coming
20 out of them are seven to ten feet below the ground,
21 then at least or seven to ten feet of those tanks are
22 below ground.
23 MR. COX: The tanks are setting there are
24 on the surface and the pipes run down seven feet from
25 the bottom of the tank.

1 JUDGE COLE: Oh, they come out of the
2 bottom of the tank.
3 MR. COX: That is correct. Yes. The
4 tanks are accessible. I can't give you a good feel
5 for the radioactivity, but from a -- you can walk up
6 next to it without violating any limits.
7 JUDGE COLE: So the concrete walls are
8 thick enough.
9 MR. COX: There are no concrete walls.
10 JUDGE COLE: In the CST tanks there are.
11 Aren't they concrete?
12 MR. COX: No, it's a steel lined tank.
13 JUDGE COLE: Oh. I guess I was looking at
14 the CST and I keep think that being a civil engineer,
15 I think C is concrete.
16 (Laughter.)
17 JUDGE ABRAMSON: And S is sludge.
18 (Laughter.)
19 MR. COX: I think it might be worth noting
20 that there's not a lot of -- you're not filling this
21 tank with water from the reactor coolant system.
22 You're using it to reject small amounts of water
23 periodically if the condenser level ever gets too
24 high. And that's probably a fairly rare occurrence
25 because normally you're making up to the primary

1 system, the feedwater system from the tank to make up
2 for any leakage in the secondary plant.
3 JUDGE COLE: I understand the condenser
4 storage tanks, the level fluctuates between -- you try
5 to keep it at 30, is that correct?
6 MR. SULLIVAN: Try to keep it greater than
7 30.
8 JUDGE COLE: And how high can it go?
9 MR. SULLIVAN: Thirty-eight feet is our --
10 JUDGE COLE: What would cause it to
11 fluctuate between 30 and 38 and does the operator know
12 -- do that? Or is it an automatic operation?
13 MR. SULLIVAN: Well, the fluctuation is
14 caused just automatically as the condenser maintains
15 a certain volume of water within the condenser. If
16 the level drops and we have to take on some make up
17 water, then that would cause the level to raise and at
18 the same time you're drawing water down as Alan
19 discussed for normal make up for the steam cycle.
20 JUDGE COLE: And you say that happens
21 automatically?
22 MR. SULLIVAN: Yes, it does.
23 JUDGE COLE: Or does the operator do that?
24 MR. SULLIVAN: That -- the surge volume
25 from the condensate system happens automatically.

1 It's monitored every -- once very four hours by the
2 operator.
3 JUDGE COLE: And what would the normal
4 fluctuation be over a four-hour period?
5 MR. SULLIVAN: About .2 feet possibly.
6 JUDGE COLE: So if it were to go
7 considerably more than that, somebody would know?
8 MR. SULLIVAN: Yes, they would.
9 JUDGE COLE: All right, thank you.
10 MR. COX: If I could clarify just a little
11 bit, the normal mode of operation would be to use that
12 tank from a period of probably several days where you
13 would have a gradually decreasing level and then you
14 would -- the operator would manually initiate make up
15 to bring the level back up to the 38 feet.
16 JUDGE COLE: Thank you.
17 CHAIR YOUNG: Let's go to the Intervenor
18 next and then the staff, unless the staff wants to go
19 ahead first.
20 Normally, we would go in the order.
21 Okay.
22 JUDGE ABRAMSON: Before we do that, since
23 the key to my question was whether or not these buried
24 pipes are necessary, and therefore within the scope
25 necessary for safety and therefore within the scope

1 and the Applicant has said no, they're not. I'd like
2 the staff to advise us whether to concur or disagree
3 with the Applicant's position.
4 MR. COX: I concur with the Applicant's
5 position.
6 CHAIR YOUNG: Do you have any follow up to
7 that? Do you --
8 MR. GUNDERSEN: I agree with the Applicant
9 that the condensation storage tank is not seismic and
10 in the event -- but the condensate storage tank still
11 is the preferred way if there were a nonseismic
12 initiated event and you were drawing water through it,
13 you would prefer to use the condensate storage tank.
14 So a seismic failure of that tank is protected by
15 other backup sources.
16 I think though when the issue gets down to
17 -- the piping is already in the order and are you
18 suggesting it go out of the order, is that the
19 question?
20 JUDGE ABRAMSON: The response that we had
21 from the Applicant in several instances and the
22 response that we had ab initio I think from the staff
23 was that these pipes are outside the scope of this
24 hearing and so I'm trying to clarify if they are or
25 are not. And we've been discussing them. We've been

1 examining them. We've been considering them, but it's
2 fundamental. If they're outside they scope, they're
3 outside the scope. So the question is what brings
4 them inside the scope? And for them to be brought
5 inside the scope, they have to be required under 10
6 CFR 54.4 and what I hear the staff telling us is
7 they're not and I hear the Applicant telling us
8 they're not. So if you have evidence that they are,
9 we'd love to hear it.
10 MR. GUNDERSEN: I have one thing I think
11 you should consider as part of that. A hole in the
12 bottom of the tank or a hole in the pipe, it's a
13 stainless steel pipe this time, not a carbon steel
14 pipe, but a hole in that pipe would introduce
15 contamination into the pipe which then could get
16 injected forward through those pumps, so that the
17 safety related system -- so in a normal, if there's
18 such a thing, in a normal accident where the preferred
19 source was that tank, should there be a hole in that
20 you're going to be injecting contaminants from the
21 ground water into the system. The pumps on the first
22 system were before this tank, so if there was a
23 collapse it could cause a back pressure.
24 This system is the opposite. The pumps
25 are beyond this, so that it is a negative pressure if

1 you will, pulling that water out and into the reactor
2 which if there's a hole in that pipe, then pulls
3 contamination from the soil --
4 JUDGE ABRAMSON: Right, and it could
5 contaminate the reactor and that would be obviously a
6 concern for on-going operations.
7 MR. GUNDERSEN: Back in the '70s I worked
8 at Northeast Utilities. The contamination of the
9 reactor was not just an operating concern. We had a
10 chloride intrusion incident which was one of the
11 famous early accidents in the history of nuclear
12 power. We contaminated the condensate storage tank
13 with chlorox which we then pumped forward into the
14 reactor and failed all the nutrient sources and there
15 was cracking in the stainless and caused the isolation
16 condenser to develop cracks, serious cracks. Because
17 we were pulling chlorides that had been put into the
18 condensate storage tank back into the system, so it's
19 not -- it's safety-related concern in that the
20 contamination from those systems being drawn back into
21 the reactor, stainless steel at 500 degrees does not
22 like contamination so that my concern is that in a
23 non-seismic event when you're going to want to use
24 that as a normal source, if there's a hole in that
25 underground pipe that then pulls contamination into

1 it, you inject that contamination into the reactor.

2 CHAIR YOUNG: Let me see if I can get some

3 clarification here and I guess I was a little

4 surprised by your testimony before. Because you do

5 say in your testimony and I think it's always been

6 said at the beginning that the condensate storage

7 system was one of the systems that's included within

8 the scope of license renewal and you addressed that in

9 your application.

10 Mr. Gundersen has suggested that other

11 issues besides seismic issues might come into play

12 with regard to safety issues that would be related to

13 license renewal.

14 Was what you were -- what I understood you

15 to say earlier was that the reason that you don't rely

16 on the condensate storage system pipes for a safety

17 function is because structurally they don't qualify if

18 that's the right word, whereas the TORUS is.

19 Did that apply to all safety issues that

20 might arise non-seismic ones that could arise? And if

21 so, what? And if not, on what basis was this system

22 included in the application as one of the six systems

23 under 54.4?

24 MR. COX: Yes, I think that it is true

25 that you could have other events than a seismic. The

1 TORUS still remains the assured source. In fact, one
2 of the two systems that rely on this suction piping
3 has an automatic transfer to the TORUS when the level
4 gets low enough in the tank that the suction pressure
5 is threatened.
6 So the TORUS is always there, whether it's
7 a seismic event or not, the TORUS is always there and
8 it will always take over if you lose water from the
9 condensate storage tank for any reason.
10 Again, for the scoping question, we -- I
11 feel like we were fairly conservative the way we did
12 scoping. We did it on a system basis which brought in
13 the whole system. We evaluated the system. We didn't
14 try to rule out specific parts of the system and say
15 this is not required. When we started getting into
16 this contention and we started examining the specific
17 functions of that individual section of buried piping,
18 that's the basis for this statement in our testimony.
19 It's not required for a design-basis event.
20 CHAIR YOUNG: So when you originally
21 included the system, you're saying there are other
22 parts of the system besides the buried parts that
23 would be relevant under the license renewal analysis
24 under 54.4?
25 MR. COX: That's correct. That was the

1 conclusion that we reached, is that the parts of the
2 system that are directly connected to the valves that
3 interface with the reactor core isolation cooling
4 system --
5 CHAIR YOUNG: I'm sorry. Back up and use
6 whole words. Maybe you just said it too fast.
7 MR. COX: The reactor core isolation
8 cooling system --
9 CHAIR YOUNG: Reactor core. Okay.
10 MR. COX: And the high pressure cooling
11 injection system. The interface valves that are
12 actually part of those systems are connected directly
13 to the condensate storage system piping, and that's
14 the reason it was included.
15 JUDGE ABRAMSON: And if there were an
16 event that threatened the buried piping, or threatened
17 the CST, would that threaten the integrity of these
18 parts that are connected to these valves in a way that
19 it could -- that it becomes necessary to rely on the
20 buried pipes and tanks from the CST for any of the
21 functions of 54.4?
22 CHAIR YOUNG: In other words, could they
23 impair the valves? Is that what you're --
24 JUDGE ABRAMSON: Yes, is there something
25 that can happen here that we -- is there some scenario

1 whereby you're going to have to need these for safety?
2 MR. COX: No.
3 MR. GUNDERSEN: May I say one thing?
4 CHAIR YOUNG: Go ahead.
5 MR. GUNDERSEN: I absolutely agree that
6 there's no scenario that would cause the -- if the
7 pipe were to fail, then they go to the -- but earlier
8 there was a statement that while it's not required, it
9 is preferred. And my concern is not degradation of
10 the type that would cause the pipe to fail. Unlike --
11 the cast iron pipe, I'm much more worried about from
12 that standpoint, but this pipe is stainless, and I
13 doubt would show that same pattern, but would show --
14 could develop a leak, and the source would then be
15 shown as Tritium in the groundwater, because probably
16 the single biggest isotope is Tritium. There might be
17 others, but certainly Tritium in the groundwater, so
18 this is a source that a monitoring well would pick up
19 well. But my concern is that given it's the preferred
20 way of cooling the plant when you turn on your HCIC
21 pumps or RCIC pumps, or whatever. You can introduce
22 contamination into the reactor that can make the
23 problem worse if there's a whole in the pump suction
24 pipe, which this is.
25 CHAIR YOUNG: Would that affect --

1 MR. GUNDERSEN: So it's safety-related,
2 but it's not flow safety-related. It's a source --
3 the hole becomes a source of contamination --
4 JUDGE ABRAMSON: Well, let's turn to 54.4
5 to answer Judge Young's question, Mr. Gundersen. 54.4
6 says it's within the scope if it's relied upon to
7 remain functional during and following design-basis
8 events, or to maintain -- to insure certain functions,
9 integrity of the reactor coolant pressure boundary,
10 capability to shut the reactor down and maintain safe
11 shutdown, capability to prevent or mitigate
12 consequences of accidents that can result in certain
13 off-site exposures from serious accidents.
14 Does the kind of failure you're concerned
15 about implicate one of those events?
16 CHAIR YOUNG: In my --
17 MR. GUNDERSEN: First of all --
18 CHAIR YOUNG: Actually, let me just ask
19 mine in conjunction with that, another clarification.
20 Is what you're talking about an event that would lead
21 to shutdown in any case? So, if so, how is that
22 related to the --
23 MR. GUNDERSEN: Okay. My experience on
24 the sister unit to Pilgrim back in the 70s was
25 Millstone I, and chloride ions had got into the

1 condensate storage tank, and were then pumped into the
2 reactor. It made a minor problem severe. We lost
3 track of all our neutron monitors. Every single
4 neutron monitor in the plant failed in about 10
5 seconds.
6 JUDGE ABRAMSON: And what did you do?
7 MR. GUNDERSEN: The plant scrammed and
8 shut down for a year.
9 CHAIR YOUNG: So it would go into --
10 JUDGE ABRAMSON: It was costly, but what -
11 -
12 MR. GUNDERSEN: Yes. In that event, we
13 were lucky because the through wall cracks in the
14 stainless -- in the isolation condenser, we didn't
15 develop through wall cracks in the -- we had
16 significant cracks in the isolation condenser but not
17 through wall. We stopped the event soon enough that
18 it was only costly, but that didn't necessarily have
19 to happen, because -- so this is -- so to answer your
20 question, Your Honor, you said relied upon. I think
21 the --
22 JUDGE ABRAMSON: Yes, the language is --
23 MR. GUNDERSEN: Relied upon. I think if
24 you look at their operator's manuals, the preferred
25 source in the operator's manual, preferred source, so

1 what they're relying on as a preferred source is the
2 condensate storage tank. But the required source then
3 becomes the TORUS, so --
4 JUDGE ABRAMSON: Well, that --
5 MR. GUNDERSEN: Are they relying on it?
6 I think the operator's manuals have said hey, try the
7 condensate storage tank first, but remember it's not
8 seismic, and if you don't have suction or whatever,
9 you don't use the TORUS.
10 JUDGE ABRAMSON: Well, I think it's a
11 little -- it's not just relied upon. You've got to be
12 careful how you read this, and here's where a lawyer
13 might give you some advice. It says "relied upon to
14 remain functional during design-basis events." And
15 during design-basis events, is it not accurate that
16 you must rely on your assured sources? That's what
17 you really rely on, that's what they're assured for.
18 In other words, yes, you might prefer to go somewhere
19 else, but when you're trying to make sure you can
20 handle a design-basis event, you have to make -- you
21 count on your assured source.
22 MR. GUNDERSEN: Yes, you count on the
23 assured source, but you may not use the assured
24 source, so I guess my -- the Applicant has already
25 said that they're going to try to use the condensate

1 storage tank. The operators would have no indication
2 of contamination through a leak, because whatever
3 monitors were in the CST would not pick it up, because
4 we're talking about the underground pipe, which is
5 then introducing contamination into the reactor, which
6 could cause, my experience, loss of neutron monitoring
7 and things like that.
8 JUDGE COLE: But the water level in the
9 tank is normally 30, 35 feet, and there would be
10 enough head pressure there where you wouldn't wind up
11 with negative pressure when you're pulling water out
12 of that tank system.
13 MR. GUNDERSEN: That was a question -- I
14 understand that. And I come back to the Green Lawn
15 stuff you put into your -- how does that get in? It
16 gets in through a Venturi-kind of effect, where you're
17 spraying your lawn.
18 JUDGE COLE: Right.
19 MR. GUNDERSEN: So I believe, my
20 experience shows that a hole would be drawn through on
21 a Venturi basis, even though the head is appreciable,
22 30 feet or so.
23 JUDGE COLE: With that much head, I doubt
24 that, but the operator would know if the water level
25 was down low enough where they would wind up with

negative pressure there, and create an effective Venturi problem. Wouldn't the operator know by virtue of the elevation readings which he has in his room?

MR. GUNDERSEN: Probably by the time it got down to --

JUDGE COLE: So then he would know not to use that as a source, and go to the --

MR. GUNDERSEN: I understand what you mean. I don't know at what head a Venturi effect would not occur in that pipe, and that's really --

JUDGE COLE: Depends on how --

(Simultaneous speech.)

MR. GUNDERSEN: I understand where you're coming -- but I don't -- it depends on the size of the hole, and the shape of the hole. But I think you could introduce contamination into the system, which could make a minor accident, if there's such a thing, worse.

CHAIR YOUNG: So, and I'm maybe catching up a little bit here, but the question about whether any of the functions specified in 54.4, insuring the integrity of the reactor coolant pressure boundary, the capability to shutdown the reactor and maintain it in a safe shutdown condition, or the capability to prevent or mitigate the consequences of accidents

1 which could result in potential off-site exposures
2 comparable to those referred to in 50.34(a)(1),
3 50.67(b)(2), or 100.11, as applicable.
4 Your answer is that any holes in the
5 condensate storage system would affect which of those,
6 and -- well, then we'll move on to the next question.
7 MR. GUNDERSEN: I guess my experience at
8 Millstone was that we had no idea if we were safely
9 shutdown, because every single neutron monitor had
10 failed. So to the degree that the neutron monitors
11 monitor -- because they had developed through wall
12 leaks, and literally every one of them failed. So to
13 the degree that knowing you're in a safe shutdown mode
14 is part of being safely shutdown.
15 JUDGE ABRAMSON: What year was that event
16 in Millstone?
17 MR. GUNDERSEN: '72, sir.
18 JUDGE ABRAMSON: Has the technology
19 changed at all since then, do you think, on how these
20 things are monitored? Is there any --
21 MR. GUNDERSEN: There is more -- I wrote
22 the Reg Guides on this, and there's certainly more
23 monitoring in the condenser. The source of the leak
24 at Millstone was a failed tube in the condenser, which
25 then fed contamination into the condensate storage

1 tank through these level changes. So you would pick
2 up the salt, or you'd pick up the increased
3 conductivity in the condenser. So for that event, I
4 think the single biggest thing the industry learned
5 was putting a lot of -- a lot of more conductivity
6 measurements in the condenser, and upstream and
7 downstream of the condensate demineralizers.
8 This event that I'm proposing with the
9 hole in the condensate pipe feeding into the HPCI
10 pumps is not monitored for contamination, because it's
11 not a normal source of water, so I don't believe
12 industry experience affects this event, but there
13 certainly was a lot of industry experience learned
14 from the chloride intrusion at Millstone. Yes.
15 JUDGE ABRAMSON: And if I understand your
16 dialogue with Judge Cole, whether or not this effect
17 that you're postulating, this Venturi effect, would
18 take place as a function of the dynamic head, the
19 static head, the size of the hole, the shape of the
20 hole, what's outside the hole in the ground. All
21 those things, right?
22 MR. GUNDERSEN: Certainly, the static head
23 on the vessel. That would be, I think, the single
24 biggest parameter that it's going to be a function of.
25 CHAIR YOUNG: So just so I can see if I

1 can understand this a little bit better. What you're
2 talking about is, if there were a hole in the
3 condensate storage system underground pipe, I guess.
4 MR. GUNDERSEN: Yes.
5 CHAIR YOUNG: That that could introduce
6 some kind of contamination that could then be sucked
7 into the reactor, and that that -- if it led to a
8 shutdown, you're saying you wouldn't be able to
9 determine the state after that, so as to determine how
10 safe the shutdown condition was. Did I -- is that a
11 fair paraphrasing of it?
12 MR. GUNDERSEN: It was great at the
13 beginning, great at the end. There was a clause in
14 the middle that wasn't quite right. If it led to a
15 shutdown, you would be in -- you would be shutting
16 down. The reactor would have probably scrammed, or
17 maybe an orderly transition, but in any event, a
18 shutdown would be occurring, at which point you'd be
19 using the high pressure cooling injection system, and
20 then later other systems.
21 CHAIR YOUNG: The what?
22 MR. GUNDERSEN: So you would be shutting
23 down.
24 CHAIR YOUNG: Using the what?
25 MR. GUNDERSEN: The high pressure cooling

1 injection, HPCI.

2 CHAIR YOUNG: Okay.

3 MR. GUNDERSEN: So you would be shutting

4 down, and could, through a leak in that line, as it's

5 the preferred source, you could introduce

6 contamination into the reactor, which could blind you.

7 Essentially, we were running blind at Northeast --

8 CHAIR YOUNG: So the question you're

9 raising is --

10 JUDGE COLE: The velocity had exceeded the

11 elevation.

12 MR. GUNDERSEN: The problem -- yes.

13 Right. That's correct, Judge Cole.

14 CHAIR YOUNG: So what we're focusing in on

15 is the capability to maintain the reactor in a safe

16 shutdown condition. You're questioning whether that

17 might happen by virtue of any introduction of any of

18 the contaminants that came in through the hole and got

19 suck into the reactor. Is that -- that's what you're

20 questioning. Right? Am I understanding?

21 MR. GUNDERSEN: Yes, I think that's what

22 I'm questioning. Yes.

23 CHAIR YOUNG: Okay. Any follow-up to

24 that? Could you provide, either Entergy, or the

25 Staff, or both, your response to that?

1 JUDGE ABRAMSON: Before we do that, Mr.
2 Gundersen, when reactors shut down and you've lost
3 your neutron monitoring, but you've scrammed it, do
4 you have reason to believe a reaction is still going
5 on? You'll know whether the control rods are in or
6 not, won't you?
7 MR. GUNDERSEN: You'll know that the
8 indications are that they fell down. But since
9 they're largely stainless, as well, you don't know
10 that -- well, actually fell in, fell up.
11 JUDGE ABRAMSON: Will you lose your
12 thermocouples? Did you lose your thermocouples? Did
13 you know what the temperature going in and out of the
14 reactor vessel was?
15 MR. GUNDERSEN: We were able to monitor
16 reactor -- we were still steaming, because the reactor
17 was --
18 JUDGE ABRAMSON: Sure. You had decay
19 heat.
20 MR. GUNDERSEN: So we had decay heat, and
21 we were running the isolation condenser, et cetera.
22 JUDGE ABRAMSON: And you were able to see
23 the steam generation rate going down as decay heat got
24 consumed.
25 MR. GUNDERSEN: The board was hardly

1 black. We had -- there was a lot of annunciators
2 going on, and I don't know about how much steam we --
3 I don't think that's where our focus was. The
4 concern is that because the control rod mechanisms are
5 also stainless, even though the board will show the
6 control rods are inserted up, that you could have had
7 a flaw in the stainless from this kind of attack.
8 Stainless at 500 degrees is pretty reactive. But at
9 Millstone, the three problems that we encountered were
10 loss of all the neutron monitors, because of inner
11 granules stress corrosion cracking.
12 JUDGE ABRAMSON: How long did that process
13 take to cause the failure?
14 MR. GUNDERSEN: About 10 or 20 seconds.
15 JUDGE ABRAMSON: From the onset of the
16 leak?
17 MR. GUNDERSEN: From the time the
18 chlorides broke through, to the time we lost --
19 JUDGE ABRAMSON: And when in the process
20 did SCRAM occur, at the beginning of the 10 seconds,
21 at the end? When? When did the SCRAM initiate, as
22 far as you know?
23 MR. GUNDERSEN: When the neutron monitors
24 started to fail, and I think the first one started to
25 fail at seven, or eight, or nine seconds, so it was --

1 -- the slug had begun into the vessel and by the time
2 the vessel shutdown and cooled down, we had cracking
3 in the isolation condenser, lost all the neutron
4 monitors, and had cracking in the stainless steel clad
5 of the vessel.
6 JUDGE ABRAMSON: And you said you wrote
7 some Reg Guides after that to prevent against this
8 sort of a failure. Now, did the Reg Guide address
9 loss of instrumentation, or did it just address the
10 particular failure you had?
11 MR. GUNDERSEN: It addressed the
12 particular failure, which was to add additional
13 condensate -- additional monitors on the condenser.
14 And then before and after the demineralizers. The
15 other source out to the condensate storage tank and
16 back remained unmonitored.
17 MS. UTTAL: JUDGE, both you and Mr.
18 Gundersen are referring to Reg Guides. Reg Guides are
19 something that are written --
20 JUDGE ABRAMSON: That's why --
21 MS. UTTAL: -- by the NRC.
22 JUDGE ABRAMSON: And so what was the
23 connection between your statement that you wrote the
24 Reg Guide, and --
25 MR. GUNDERSEN: I'm sorry. I was an

1 engineer in Northeast Utilities. I was chosen because
2 I knew calculus better than the other engineers,
3 having been most recently out of college, compared to
4 some of the older engineers. The initial contacts
5 were a meeting with the entire -- it was at least 150
6 NRC staffers in Bethesda, and I presented the dynamics
7 of the accident, which I had modeled. Turned out to
8 be three coupled partial differential equations where
9 condensate storage tank was feeding in, and the
10 condensers and the demineralizers were breaking
11 through, and there were other loops involved, as well.
12 That description, then, resulted in
13 regulation, which the industry rolled through to
14 assure that the condenser was better monitored, to
15 assure that the condensate demineralizers were better
16 monitored, both on the inlet and the outlet side.
17 That same description then got rolled over to
18 pressurized water reactors, and was also implemented
19 on pressurized water reactors. The point person for
20 the NRC was a guy named Dan Pomeroy, and I worked
21 extensively with him for several years on this issue
22 to make sure that --
23 JUDGE ABRAMSON: So you had input into the
24 writing of the Reg Guide.
25 MR. GUNDERSEN: Correct.

1 JUDGE ABRAMSON: You didn't author it
2 yourself.
3 MR. GUNDERSEN: That's correct, sir.
4 JUDGE COLE: This was in 1972?
5 MR. GUNDERSEN: Yes.
6 JUDGE COLE: That was AEC then.
7 MR. GUNDERSEN: Yes.
8 JUDGE ABRAMSON: All right. Judge Cole
9 has been with this agency since it was the beginning,
10 the AEC. He's one of the few relics of that era.
11 (Laughter.)
12 CHAIR YOUNG: Institutional memory.
13 JUDGE ABRAMSON: But let me ask you one
14 more question, Mr. Gundersen. Have you done any
15 computations to give us an idea what size hole, and
16 what kinds of heads, what the trade-off would be,
17 where you think this Venturi effect might occur, or
18 might not?
19 MR. GUNDERSEN: No, I have not.
20 JUDGE ABRAMSON: So this is intuition at
21 this point, not based on any analysis.
22 MR. GUNDERSEN: It's professional opinion.
23 I hate to say just intuition, but it is not based on
24 a mathematical analysis. No, it's not.
25 PARTICIPANT: May I apologize for him?

1 We're a public interest group, and my husband gave me
2 a birthday and Christmas present, to pay for his
3 expertise.
4 CHAIR YOUNG: Do you know what number Reg
5 Guide that resulted in?
6 JUDGE COLE: NUREG something.
7 MR. GUNDERSEN: It would have had to be a
8 NUREG. It was early, I mean --
9 JUDGE COLE: It was probably -- well, not
10 a NUREG. It was something else. What did they call
11 them?
12 MR. GUNDERSEN: There were actually two,
13 I remember, because the boiling water reactor one came
14 out first, and then very rapidly the pressurized water
15 reactor realized that they had maybe not a safety
16 problem, but they were injecting chloride ions on to
17 the steam generator, which was a no-no, also. And so,
18 it wound up being written twice, once for boiling
19 water reactors, and once for pressurized. But no, I
20 can't -- I was surprised I remember Dan Pomeroy's
21 name.
22 CHAIR YOUNG: If you can clarify that, and
23 maybe in consultation with the staff, and provide that
24 later. I'm just curious about that.
25 Do you know whether those protections that

1 you recommended, and that were implemented into the --
2 -- whatever document it was, that those are now
3 required on the part of all current plants?
4 MR. GUNDERSEN: It was -- yes, all -- the
5 protections, again, were not in this line, but the
6 protections that were recommended by Northeast
7 Utilities Group in conjunction with the NRC are
8 industry standards now, yes. But the protections are
9 mainly on the condenser in both the inlet and
10 discharge of the condensate demineralizer. To the
11 best of my knowledge, contamination coming -- sort of
12 like doing the end run through the condensate storage
13 tank was not addressed in those modifications to the
14 plants.
15 JUDGE ABRAMSON: Was the type of
16 contamination that was introduced through the leak
17 that you had the same contamination one would expect
18 from groundwater on the site?
19 MR. GUNDERSEN: The -- I would expect it
20 would be different. You would -- the Millstone
21 experience was largely chloride ion. I've seen some
22 documents about sulfates, but I guess I would expect
23 that it would be different is about all I can say.
24 CHAIR YOUNG: Did you have anything to add
25 on that? Okay. Do you understand what the issue is

1 that Mr. Gundersen has presented, and could you -- do
2 you have any response to that?
3 JUDGE ABRAMSON: What's your view of this
4 scenario that Mr. Gundersen has postulated?
5 MR. SULLIVAN: Well, there's really two
6 things that Mr. Gundersen discussed. One is the
7 possibility of having leakage into the buried line
8 that supplies -- could supply water to HPCI and RCIC
9 system, and the other is the Millstone event.
10 CHAIR YOUNG: Excuse me for just a second.
11 MR. SULLIVAN: Yes.
12 CHAIR YOUNG: The court reporter, whenever
13 they say HPCI and RCIC, you've got the acronyms over
14 there for that. Okay. Thank you.
15 MR. SULLIVAN: I'm sorry. I'll try to
16 spell them out.
17 CHAIR YOUNG: Well, you weren't the first
18 one. I just wanted to make sure that we got it
19 correct --
20 JUDGE ABRAMSON: I did it first.
21 CHAIR YOUNG: -- ultimately, so when we're
22 reading the transcript we'll know what we're referring
23 to.
24 MR. SULLIVAN: But I can correct what I
25 say. The scenario related to the high pressure

1 coolant injection system, HPCI, or reactor core
2 isolation cooling system, RCIC, where water would be
3 drawn in, we just don't find that it's credible for a
4 couple of reasons. One is, the piping is stainless
5 steel piping, and the choice -- the material was
6 chosen because it's a material that's not susceptible
7 to corrosion, and it's very durable.
8 The possibility of groundwater or
9 chloride, or water heavily contaminated with chlorides
10 being drawn in, we just don't see it as being
11 credible. There's approximately a 30 foot head, 30-38
12 foot of head on that piping at all times.
13 JUDGE ABRAMSON: Do you understand that?
14 MR. SULLIVAN: Oh, I'm sorry.
15 CHAIR YOUNG: Actually, basically, let me
16 see if I can back up a little bit. What I understand
17 you to be saying is that you don't think that a leak
18 could occur that would lead to that. But earlier what
19 we were saying was, what people here were saying, as
20 I understood it, was, essentially, that because it's
21 not being relied on for a safety function in the
22 context of the TORUS, being the source that you rely
23 on, you don't really need to even get to the question
24 of how leaks would occur, et cetera.
25 Here's my question, and then definitely

1 you can address the leaks. But assuming that a leak
2 did occur, what's your view of how whatever
3 contamination might come in, might lead to the
4 question about the ability to maintain the plant in a
5 safe shutdown condition, because that's the specific
6 part of 54.4. That's the issue that's being raised by
7 Mr. Gundersen, as I understand it. And that's sort of
8 a separate question than -- well, that's not only a
9 separate question, but it's sort of determinative of
10 whether you need to look at the mechanisms and
11 likelihood of leaks and so forth. And you were going
12 directly to the likelihood of leaks in the first
13 place, so maybe if you could first address for me the
14 possibility of once a contaminant got in, it then --
15 raising some question about the ability to insure
16 that the --
17 MR. COX: Reactor is shut down.
18 CHAIR YOUNG: To maintain the reactor in
19 a safe shutdown condition. I forget where that
20 sentence started, but anyway, you get the drift.
21 MR. COX: I've got the idea, a couple of
22 counts. Again, I think it's -- Brian mentioned that
23 it's unlikely that you would have the leak. I think
24 the other thing that's very unlikely is that if you
25 did have a leak, that you would draw contaminants into

1 the pipe. Again, it's because of the head of the
2 water above it, you don't have much pressure drop in
3 a line that size with the flow rates that we're
4 talking about in these systems, so it would be very
5 unlikely that you would get to the point where you'd
6 have a negative pressure in there, and be drawing
7 water in from outside.
8 The Venturi effect that he mentioned on a
9 garden hose sprayer, that's a specially designed
10 nozzle that's designed to give you a low pressure area
11 to draw the contents out of a cannister to get your
12 fertilizer into the spray. The analogy that I would
13 make to the situation that we have with the condensate
14 storage tank is if you took a water hose and poked a
15 hole in it, and stuck that hose down in a bucket of
16 water, would it fill up the bucket, or would it empty
17 the bucket? I think it's going to fill up the bucket
18 in most cases. It would be a very rare case, you'd
19 have to have a long run of pipe going down to a very
20 low level creating a vacuum on that to have it
21 otherwise.
22 And the last part of that, that I wanted
23 to address briefly is the -- I believe I understood
24 Mr. Gundersen correctly. His concern was pressure
25 boundary failures in the systems that were caused by

1 this contamination that happened in a matter of, I
2 believe he said in a matter of seconds after the
3 introduction of the contamination.
4 In my experience, that's not likely. I'm
5 not aware of any operating experience with any kind of
6 contamination that I've ever heard of being from
7 condenser tube leak, or whatever, where you would get
8 contaminants in a system, and have that immediate a
9 response in terms of pressure boundary failures.
10 CHAIR YOUNG: So the issue of -- well, the
11 first issue is whether there would be a leak. The
12 second issue would be whether there could be the
13 effect that would bring in the contaminant. And then
14 the third issue would be -- well, first, I guess two
15 parts to it. Is the only way -- let me direct this
16 back to you, first. Is the only way that there could
17 be a question about the ability to maintain the
18 reactor in a safe shutdown condition the potential
19 introduction of the contaminant? Do we need to take
20 a break?
21 JUDGE ABRAMSON: I'll be right back.
22 MR. GUNDERSEN: I'm sorry. I have ADD.
23 I got distracted.
24 CHAIR YOUNG: Okay. Is the only way that
25 this issue that you're raising about the question of

1 the ability to maintain the reactor in safe shutdown
2 condition. That would be dependent on the
3 introduction of the contaminant into the reactor.
4 Right?
5 MR. GUNDERSEN: Yes. I don't believe that
6 a stainless steel pipe's overall integrity is going to
7 cause the pipe to collapse, or reduce the flow.
8 CHAIR YOUNG: Okay. But all I'm asking
9 is, the only issue about ability to maintain the plant
10 in safe shutdown condition is the introduction of a
11 contaminant. Forget where it comes from. That's the
12 mechanism that would raise the problem that you're
13 talking about. Right?
14 MR. GUNDERSEN: Yes. That's correct.
15 CHAIR YOUNG: Okay. So then going back to
16 you, you don't disagree with him, that if a
17 contaminant got in, a question could be raised?
18 MR. COX: If the contaminant got in, and
19 I guess in my professional opinion, the effects would
20 be long-term effects caused by corrosion mechanisms
21 that they're not going to happen within seconds, or
22 minutes, or even hours, but more like months.
23 CHAIR YOUNG: What I'm talking about is,
24 forget how it got there. If it gets in, is there any
25 question about the contaminant in the reactor vessel

raising a question about the ability to insure the capacity to maintain the reactor in safe shutdown condition?

MR. COX: Yes, there is a question. It's not credible. You're going to -- we have samples that are taken from those systems on a routine basis.

CHAIR YOUNG: The whole -- let me back up.

MR. COX: If you contamination, you would know.

CHAIR YOUNG: Hold on. Hold on. I'm not asking about the likelihood of contamination. The sole question I'm asking right this minute is, if you got contamination, is there any question that it would bring into question the ability to maintain the reactor in safe shutdown condition, if you got it.

MR. SULLIVAN: No.

CHAIR YOUNG: All right. Now, let's move back. Then the issue --

MR. SULLIVAN: I would like to qualify that.

CHAIR YOUNG: Oh, go ahead.

MR. SULLIVAN: Because when the reactors shut down, the first thing the operators do, and they are trained to do, and they are trained like this across the country, is to verify that the reactor is

1 in a safe shutdown condition. And the first thing
2 they look at is to make sure that all control rods are
3 fully inserted. That is the very first thing that
4 they check. And if all rods are in, you're shutdown.
5 CHAIR YOUNG: And is there any question
6 about the monitoring system for that, that would bring
7 into question whether that's happened, or whether any
8 contaminant was in the system? Is -- and maybe I need
9 to go back to Mr. Gundersen, but is that -- was that
10 the only way you were saying that the contaminant
11 could raise a question, is the effect that it would
12 have on the steel, if the rods weren't up?
13 MR. GUNDERSEN: No, I don't think I said
14 that. And, by the way, I didn't suggest that the
15 pressure boundary was failed. We had significant
16 attack on the stainless steel clad of the vessel, and
17 stainless steel components, but the pressure boundary
18 did not fail.
19 What did fail was the neutron probes,
20 which run throughout the reactor, and there the
21 through wall cracks grew incredibly fast, on the order
22 of 10 seconds. And yes, the first thing a reactor
23 operators look at is at the board to make sure all the
24 rods are in. The second thing they look at is the
25 neutron monitors, and the two didn't agree. We had

1 every neutron monitor failed, and there was no idea
2 what the neutron fluence was. And, yet, the rods were
3 in, so the reactor operators were in conflict.
4 CHAIR YOUNG: So taking that into account,
5 go ahead with what you were explaining about.
6 MR. GUNDERSEN: That the reactor operators
7 would verify that all rods have fully inserted, and
8 they would be able to do that.
9 CHAIR YOUNG: They would be able to do
10 that because --
11 MR. GUNDERSEN: That's correct.
12 CHAIR YOUNG: -- of improvements in the
13 technology since then?
14 MR. GUNDERSEN: No, the technology is
15 essentially the same, but the indication that they're
16 looking at are read switches, which are just magnetic
17 switches similar to what you see on top of doors for
18 alarm systems sometimes. A magnet travels up with the
19 control rod drive as it inserts, and it picks up the
20 read switches as it's moving and fully inserting. And
21 then when they get all the way in, they indicate zero
22 zero, which is the full in position, and they also
23 have a backup sensor that provides a green light that
24 rods have been fully inserted.
25 MR. COX: Okay. I could clarify that a

1 little bit. I think Mr. Gundersen was referring to
2 the nuclear instrumentation that would be used to
3 verify the reactor is shut down. What Brian is saying
4 is you don't need to look at your nuclear
5 instrumentation, you can look at the position of the
6 rods and know that the reactor is shut down.
7 MR. SULLIVAN: And the shutdown
8 instrumentation that would be used after the rods were
9 in, the IRM, Intermediate Range Monitors, and Shutdown
10 Range Monitors, I'm sorry, Source Range Monitors would
11 be inserted into the core so that you can then monitor
12 what's going on inside the core.
13 CHAIR YOUNG: That's the neutron monitors
14 that he was talking about?
15 MR. SULLIVAN: He was talking about the
16 Power Range Monitoring System, which is different.
17 CHAIR YOUNG: Okay. So --
18 MR. SULLIVAN: Quite honestly, I don't
19 know what he was talking about, but I'm trying to
20 answer the question with regard to how Pilgrim Station
21 is operated, and how boiling water reactors are
22 operated.
23 JUDGE ABRAMSON: So, in your mind, there's
24 no question that you would know that the reactor is
25 shut down.

1 MR. SULLIVAN: That's correct.

2 JUDGE ABRAMSON: And that you could safely

3 maintain shutdown after that, whether or not

4 contaminant had been drawn in by this postulated

5 scenario.

6 MR. SULLIVAN: That's also correct.

7 CHAIR YOUNG: And the way you would know

8 that is -- well, how?

9 MR. SULLIVAN: You would check that all

10 rods fully inserted.

11 CHAIR YOUNG: No, I mean after that, after

12 that, that the rods were inserted, and that if a

13 contaminant was there, that it wouldn't have any

14 effect.

15 MR. SULLIVAN: Well, the level of

16 contamination that's being discussed here from a

17 condenser tube leak, Pilgrim Station has two

18 condensers. Each condenser is broken down into two

19 different water boxes. Each water box has 10

20 conductivity elements in it, which monitor for tube

21 leaks. And the reason why there's 10, is so you get

22 some idea of where the tube leak is.

23 CHAIR YOUNG: The reason why this?

24 MR. SULLIVAN: Why there's 10 conductivity

25 elements, is so that you have some idea where the leak

1 is coming from.

2 JUDGE ABRAMSON: But he's speculating --

3 the scenario that's being speculated about here is

4 one where the source of the contaminant is not from

5 the tube leak, it's from this drawing in of

6 groundwater which contains contaminants into this tube

7 by a Venturi effect, despite the 30 feet of head.

8 And, so, it's a very different -- and as I understood

9 Mr. Gundersen, you would expect this to be quite

10 different type of contamination.

11 MR. SULLIVAN: That's correct.

12 JUDGE ABRAMSON: So setting aside for a

13 moment what this contamination would do, because this

14 is, in my view, quite speculative. We have no idea

15 what's being drawn in, or whether it can be drawn in,

16 so let's talk about maintaining the reactor in a safe

17 shutdown condition.

18 As I understood you to say, if you lost

19 your Power Range Neutron Detectors, once you shut it

20 down, you insert the Intermediate Range --

21 MR. SULLIVAN: Source Range.

22 JUDGE ABRAMSON: Source Range Detectors,

23 and those were not in the reactor at the time that

24 this contaminant was introduced, so you don't have any

25 reason to believe at the outset, at least, that

1 they're not going to function.

2 MR. SULLIVAN: That's correct.

3 JUDGE ABRAMSON: What other mechanisms do

4 you have to observe whether or not this is shut down?

5 For example, can you watch the steam generation rate?

6 Can you watch the temperatures, et cetera?

7 MR. SULLIVAN: All of those. You can

8 watch all of those. All of those would be secondary

9 indications. You would know by whether or not your

10 pressure control systems were working adequately. If

11 you could not maintain pressure control within the

12 prescribed band following the shutdown, you would know

13 if you had excess steam generation. Those would be

14 secondary indications.

15 CHAIR YOUNG: Excess?

16 MR. SULLIVAN: Steam generation.

17 CHAIR YOUNG: Steam generation. I'm

18 missing some of your words, sometimes.

19 MR. SULLIVAN: Okay. I'll slow down.

20 CHAIR YOUNG: Okay.

21 MR. SULLIVAN: But those would be

22 secondary indications. If your rods are in, your

23 reactor is shut down.

24 CHAIR YOUNG: Now, Mr. Gundersen, after

25 having heard what they've said about assuming a

1 contaminant got in, whether you'd be able to maintain
2 it in safe shutdown condition. What's your response
3 to that? Do you have questions about what they're
4 saying about the ability to know what's going on, and
5 to maintain a safe shutdown condition?
6 MR. GUNDERSEN: Just one split second. I
7 need to -- there was a period when we were running
8 blind until we could use the other monitors, which had
9 been previously withdrawn. And after that, we could
10 then confirm that the board was correct, and that the
11 rods had been inserted.
12 CHAIR YOUNG: So with --
13 MR. GUNDERSEN: So there was -- yes, after
14 Northeast Utilities got the probes that -- the sources
15 that -- the neutron detectors that had been withdrawn
16 were reinserted, at that point we could confirm that
17 the board was correct. But there was a period of time
18 when we could not.
19 CHAIR YOUNG: So, in other words, you're
20 not questioning -- let me ask. Are you questioning
21 what the Applicant just said about their ability to
22 know what was going on, and maintain a safe shutdown
23 condition?
24 MR. GUNDERSEN: No.
25 CHAIR YOUNG: You're not questioning that.

1 Okay. So, basically, what I understand is that, at
2 this point, there's not really any question remaining
3 about the ability to fulfill the functions in Section
4 54.4, the ones that Judge Abramson read off.
5 MR. GUNDERSEN: There was a list. Could
6 you read it one more time? I think you could get to
7 a safe shutdown mode, and --
8 JUDGE ABRAMSON: And maintain it.
9 MR. GUNDERSEN: Would you read the list?
10 CHAIR YOUNG: And maintain it.
11 MR. GUNDERSEN: And maintain it. I guess
12 that's my -- could you read that one last time, before
13 I --
14 CHAIR YOUNG: Okay. The scope of license
15 renewal. "Plant systems, structures, and components
16 within the scope of this part are one, safety-related
17 systems, structures, and components which are those
18 relied upon to remain functional during and following
19 design-basis events, as defined in 50.49(b)(1), to
20 insure the following functions; one, the integrity of
21 the reactor coolant pressure boundary; two, the
22 capability to shut down the reactor and maintain it in
23 a safe shutdown condition; or, three, the capability
24 to prevent or mitigate the consequences of accidents
25 which could result in potential off-site exposures

1 comparable to those referred to in 50.34(a)(1),
2 50.67(b)(2), or 100.11, as applicable." And then,
3 "Non-safety related systems, structures, and
4 components", I don't think we're talking about those,
5 but "whose failure could prevent satisfactory
6 accomplishment of any of the functions identified in
7 1-3", that I just read.
8 MR. GUNDERSEN: Okay. I'm okay with the
9 initial no that I gave you about a minute ago.
10 CHAIR YOUNG: No to? There's no problem.
11 In other words, at this point --
12 MR. GUNDERSEN: I think the event which I
13 postulated -- after the event, which I postulated,
14 with some scrambling, they could get the reactor into
15 a safe shutdown mode, and maintain it therein.
16 CHAIR YOUNG: Okay. Okay.
17 MS. LAMPERT: Now, may I just ask, it
18 seems like there's been a change here. It is listed
19 to be in scope, and so isn't the question a more basic
20 one of shouldn't it be operating properly? There was
21 a reason that, in my imagination, the Gods at NRC who
22 wrote this thought that it was important to the safety
23 of the reactor.
24 CHAIR YOUNG: Let me see if I can
25 paraphrase, and everybody tell me if I'm not doing

1 this right. Okay? Just to try to pull it together.
2 As I understand it, the reason that the
3 condensate storage system was put into the application
4 as one of the systems that was within scope is because
5 there are parts of it that would play into the
6 functions that we're talking about. However, the
7 underground pipes and tanks are not those that you're
8 concerned about, because the TORUS would take over for
9 those. So it was in for reasons other than the
10 underground pipes and tanks. Does that make sense,
11 and does that accurately answer the question, which I
12 think is the same one I asked before, essentially?
13 MR. GUNDERSEN: That is correct. You said
14 that very well.
15 CHAIR YOUNG: Did that make sense to the
16 Intervener?
17 MS. LAMPERT: Can I just wait one second?
18 JUDGE ABRAMSON: While we're on this, and
19 waiting for Pilgrim to have their internal discussion,
20 does the Staff have any comments on this banter about
21 this scenario?
22 MR. CHAN: I just want to say that I don't
23 have experience in plant operations, to address what
24 Entergy did.
25 JUDGE ABRAMSON: Okay. That's fine.

1 We're not asking you to speculate. We have enough.

2 CHAIR YOUNG: It got into -- the

3 contention came in because the system was in scope.

4 Later, in preparation, Entergy, as I understood your

5 testimony, realized that the underground pipes and

6 tanks weren't really the reason why it's in scope,

7 because as far as those go, the TORUS would be the

8 source that you rely on. Correct?

9 MS. LAMPERT: So, in other words, over the

10 past couple of years, we have managed to shrink and

11 collapse the definition of function, where our

12 understanding was, is that in going forward another 20

13 years, that we want systems that are considered

14 important to be functional, and that would be, as they

15 defined it, getting the necessary liquid from Point A

16 to B, as opposed to into the ground. I mean, that's

17 sort of the definition of it being functional, but it

18 seems like we have been on a very severe diet.

19 JUDGE ABRAMSON: I think that -- I

20 understand your frustration, but I think that you're

21 mischaracterizing what this is about.

22 We have an application, the Agency has an

23 application for a license extension. The regulations

24 that prescribe what they have to do for a license

25 extension are very narrow, and very specific, and they

1 say the following systems, structures, and components
2 are appropriate for examination, and must be examined
3 during a license extension application, and nothing
4 else. And the systems, the pipes that we're -- that
5 you raised a question about, which were all buried
6 pipes and tanks that might contain radioactive fluids,
7 and we understand you raised them because you were
8 worried about leaking radioactive fluids into the
9 groundwater, the Board admitted that contention in an
10 abundance of caution, to make sure that we examined
11 absolutely every possibility to make sure that what
12 was required to be examined in this process was
13 properly examined.
14 CHAIR YOUNG: I think the frustration -
15 and maybe your confusion was the same as mine earlier,
16 when I asked why was it listed as being in scope, if
17 now you're saying it's not in scope? And as I
18 understand the answer, the system is still within
19 scope, and so Entergy has to demonstrate to the Staff
20 that the entire condensate storage system, or the
21 system as a whole fulfills the functions that are
22 listed in 54.4.
23 What they're telling us now is that while
24 the system as a whole is still being looked at by the
25 Staff, and it's still being looked at in terms of the

1 license renewal, that the buried pipes and tanks,
2 which was the only part of that system that we allowed
3 in with regard to this contention, because the
4 contention was about buried pipes and tanks, that they
5 realized that the buried pipes and tanks in that
6 system were not the relevant parts for purposes of
7 looking at whether the functions were fulfilled. So
8 I don't think that there's any cessation of looking at
9 whether the functions are fulfilled on the part of the
10 Staff in terms of the contention that's before us. The
11 contention did not include the other parts of that
12 system.
13 MS. LAMPERT: Okay.
14 CHAIR YOUNG: Does that make sense?
15 MS. LAMPERT: It makes sense if, again,
16 I'll defer to him, but in my mind, if it's the
17 preferred source, and if minerals, contaminants get
18 into a hole, let's say, can it cause -- Step Two, can
19 it cause degradation in the next system that would be
20 required for safe shutdown? In other words, going --
21 would this be a root of a problem that would fit in?
22 Does that sound crazy to you?
23 CHAIR YOUNG: And I think they can answer
24 that, but I think that -- what I understood was that
25 the two systems, the condensate storage system, and

1 the TORUS, were separate, and so you couldn't have a
2 contamination of the TORUS through the condensate
3 storage system. Right?
4 MR. SULLIVAN: That's correct.
5 CHAIR YOUNG: Judge, could we take a
6 break?
7 CHAIR YOUNG: Yes, we're going to take a
8 break. Let's let that settle, take a break, and then
9 if we have any more follow-up after the break. Let's
10 be back at 4:00, that's 15 minutes.
11 Before everyone leaves, if counsel could
12 come back.
13 JUDGE ABRAMSON: Counsel for Entergy, can
14 you come back for just a second, please?
15 CHAIR YOUNG: Is Ms. Uttal here?
16 CHAIR YOUNG: Yes, I'm here.
17 JUDGE ABRAMSON: Just one quick --
18 CHAIR YOUNG: Ms. Lampert just raised the
19 question of off-gas system, so when we come back from
20 the break, would you be prepared to address --
21 JUDGE YOUNG: The standby gas treatment
22 for the off-gas system.
23 JUDGE ABRAMSON: Right.
24 CHAIR YOUNG: Off-gas system.
25 MS. LAMPERT: It's the one that goes to

1 the filter --

2 MS. UTTAL: That's the standby.

3 MS. LAMPERT: The standby.

4 MR. LEWIS: They both go up the stack, and

5 they're different systems.

6 CHAIR YOUNG: At the break, would you talk

7 to each other, and figure out what you're talking

8 about, and then you can --

9 JUDGE ABRAMSON: We need to find out what

10 she's talking about.

11 MS. UTTAL: It's easy to figure out.

12 CHAIR YOUNG: Well, what I'm saying is,

13 can you talk with each other and clarify that you're

14 talking about the same thing, whatever it may be.

15 JUDGE ABRAMSON: Just ask her. Just

16 figure out what it is she's concerned about.

17 CHAIR YOUNG: And then we'll take that up

18 when we come back.

19 MS. UTTAL: Okay.

20 CHAIR YOUNG: All right. Now we can go

21 off the record. Thanks.

22 (Whereupon, the proceedings went off the

23 record at 3:47:25 p.m., and went back on the record at

24 4:05:54 p.m.)

25 CHAIR YOUNG: On the record. All right.

1 Let's see. We left things I think on the note was
2 there any follow-up to the last sort of clarification
3 that we had. Go ahead.
4 MR. GUNDERSEN: There is one Pilgrim
5 document that does speak to contamination entering the
6 reactor through the condensate storage tank which we
7 would like to get on the record. It's a document
8 signed by Paul McNulty in 2004 and it has a Bates on
9 it of PilR00045.
10 JUDGE ABRAMSON: Why don't you have it
11 circulated quickly so we can look at it?
12 MR. GUNDERSEN: Okay.
13 JUDGE ABRAMSON: And let see what Entergy
14 says about it.
15 MR. GUNDERSEN: And while Ms. Lampert --
16 I'll just read the paragraph. It's on page 10 of the
17 document which page 10 is 45116 is the Bates.
18 "Intrusion from undetected organochlorides and
19 organosulfates can contaminate the condensate storage
20 tank resulting in increased chlorides and sulfates in
21 the condensate system and reactor." Then it goes on
22 to say, "Current conductivity, sulfate analysis and
23 TOC methods" which I think are total organic
24 compounds, I think that's what that is, "done at
25 Pilgrim Nuclear Power Station will not provide the

1 information needed to prevent this." So I wanted to
2 get that on the record because it does address the
3 fact that contamination can enter the reactor through
4 the path that I suggested.
5 MR. LEWIS: I'd like to see that document.
6 I don't hear that saying at all that contamination is
7 going to occur through the buried piping. I didn't
8 mention intrusion through the buried piping at all.
9 CHAIR YOUNG: Let everyone look at it and
10 --
11 JUDGE ABRAMSON: Let's see what it says
12 and we'll deal with it. In the meantime, have Pilgrim
13 Watch figured out which other system it was concerned
14 about?
15 (Off the record discussion.)
16 CHAIR YOUNG: Well, let's finish up this
17 one.
18 MS. LAMPERT: Yes. This is what we
19 decided. In recognition of the scope having become
20 very narrow, it really wouldn't make any difference to
21 talk about either because the conversation on the
22 condensate service system would wind up in the same
23 place. And so we'll drop that, but we would like the
24 opportunity to have a discussion about monitoring
25 wells and the important role that they could play

1 particularly in what seems to be a --

2 CHAIR YOUNG: I actually had a follow-up

3 question on that after we finish with these. So why

4 don't we go ahead with this. But I guess the only

5 question I would ask you is you do understand how we

6 got from sort of where we started to understanding why

7 the argument is being made that the underground pipes

8 and tanks of the condensate storage system are not

9 counted on to fulfill the safety functions under 54.4

10 because the TORUS is the actual source that they rely

11 on.

12 PARTICIPANT: Safety source.

13 CHAIR YOUNG: Was that clear before?

14 MS. LAMPERT: Your explanation was

15 certainly very clear. What hadn't been clear and I

16 think in the public's mind is not clear why in this

17 relicensing process that we are not what appears to be

18 focused on the disaster as opposed to having an aging

19 management required program on systems that were put

20 into place that would lead to preventing catching the

21 problem before the horse had left the barn.

22 That's, I guess, a conceptual problem and

23 I understand that you didn't write the rules which is

24 unfortunate. But that's the issue. I understand what

25 you're saying.

1 CHAIR YOUNG: Just for those in the
2 audience who may not be following all this, basically
3 what happens in this adjudication is based on the
4 issues that are allowable under the rules and that
5 we've allowed in through contentions. That doesn't
6 mean that the staff doesn't address issues that are
7 not part of the contentions and it doesn't mean the
8 issues that are not looked at in license renewal are
9 not looked at in other ongoing operational oversight
10 that takes place.
11 MS. LAMPERT: We understand that and
12 that's why we spent a lot of time and paper explaining
13 why the day-to-day maintenance was not adequate and
14 this was the opportunity when we're entering a new
15 phase to put supplements on the aging management
16 program so that we would have public safety assurance.
17 Hence, that's that. But I certainly
18 understand what you've said.
19 CHAIR YOUNG: Okay. Now with --
20 PARTICIPANT: Let's talk about this
21 exhibit.
22 CHAIR YOUNG: -- with regard to the
23 exhibit. You're looking at page 10 and, Mr. Lewis,
24 you've had a chance to look at that as well and I
25 think you raised the question whether that related to

1 any contamination coming from the underground pipes
2 and tanks.
3 MR. LEWIS: I won't object to this
4 document coming in. I would just like to ask three
5 follow-up questions on this whole topic.
6 CHAIR YOUNG: Okay. Any objection from
7 the staff?
8 (No verbal response.)
9 CHAIR YOUNG: So then this will become
10 Exhibit 72.
11 (Whereupon, the above-referred
12 to document was marked for
13 identification as Exhibit No.
14 72, and received in evidence.)
15 (Off the record discussion.)
16 CHAIR YOUNG: Is that right? Seventy-two,
17 I think that's right.
18 MS. LAMPERT: Fifty-two A.
19 CHAIR YOUNG: Pardon me?
20 MS. LAMPERT: Excuse me.
21 CHAIR YOUNG: Okay. And what were your
22 questions?
23 MR. LEWIS: Should I just ask or should I
24 tell you?
25 JUDGE ABRAMSON: No. Let's expedite this

1 process. You have something you want to have your
2 experts reply to.
3 MR. LEWIS: Yes.
4 JUDGE ABRAMSON: Let's get on with it.
5 MR. LEWIS: With respect to the Venturi
6 effect seeing that was raised, there was some
7 references to groundwater being sucked into the
8 condensate storage system buried piping. What is the
9 relationship of that buried piping to the water table?
10 MR. COX: I can answer that. The buried
11 piping is at elevation, is buried seven to ten feet
12 deep. The water table is approximately 17 feet deep.
13 So the source of water if it was drawn into that pipe
14 would be from the groundwater.
15 MR. LEWIS: And is it also true that above
16 that buried piping, above the buried CST piping, the
17 area above that is covered with asphalt? Is that
18 correct?
19 MR. COX: That is correct.
20 MR. LEWIS: In addition, there was a
21 reference to the Venturi effect which happens, as I
22 understand is correct, when the velocity head exceeds
23 the pressure head. Is that correct?
24 MR. COX: That's correct.
25 MR. LEWIS: Am I correct that if the

1 velocity head exceeded the pressure head there would
2 be a loss of net positive suction head?
3 MR. COX: That's correct.
4 MR. LEWIS: And what would happen with the
5 pumps at that point, the HPCI and RCIC pumps?
6 MR. COX: The pumps would trip.
7 MR. LEWIS: And final question --
8 CHAIR YOUNG: They would short.
9 MR. COX: Shut off.
10 PARTICIPANT: They would trip.
11 CHAIR YOUNG: Shut off.
12 MR. LEWIS: Final question with respect to
13 this new exhibit, does this indicate that chlorides
14 can be introduced through the buried piping?
15 MR. COX: This addresses chlorides getting
16 into the condensate storage tank and being introduced
17 through the normal method. It would have nothing to
18 do with chlorides being drawn into the buried piping
19 from outside the pipe.
20 CHAIR YOUNG: Where would they come from?
21 MR. COX: The item that this addresses
22 would be for chlorides coming from the condensate, the
23 mineralizers. This is actually addressing an analyzer
24 to monitor the water before it goes into the
25 condensate storage tank to make sure you didn't have

1 chlorides in there. If it gets in there, the sampling
2 on the condensate storage tank will detect it.
3 CHAIR YOUNG: Was that all?
4 MR. LEWIS: Yes.
5 CHAIR YOUNG: Any follow-up to that?
6 DR. AHFIELD: Yes. Just a comment on the
7 relation of the elation of CST pipe to the water
8 table. There is a plausible scenario here, I think,
9 if this hypothesized hole is of sufficient size that
10 during the surge phase of the, that is the filling
11 phase of the, tank water could leave the pipe and
12 depending on the geologic conditions immediately
13 surrounding the pipe it could actually rather than
14 infiltrate downward take its time doing so and if the
15 water is coming out of the pipe fast enough, pond up
16 a bit and this, of course, happens from the time to
17 time that you could get a pressure head outside the
18 pipe and a source of water, now this condensate water
19 having left the pipe, sitting in the formerly
20 unsaturated soils, mixing with whatever is there and
21 then coming back in perhaps.
22 CHAIR YOUNG: Through the same hole?
23 MR. COX: Yeah.
24 DR. AHFIELD: Say it again.
25 MR. COX: Temporary perched water.

1 DR. AHFIELD: Essentially yes.

2 JUDGE COLE: We understand the scenario.

3 Thank you.

4 CHAIR YOUNG: You asked -- I said from the

5 same hole, through the same hole and he said yes.

6 DR. AHFIELD: Yes. That's the scenario

7 we're describing, yes.

8 CHAIR YOUNG: Right.

9 CHAIR YOUNG: Does the staff have anything

10 to add on this?

11 MR. CHAN: The staff agrees first with the

12 Applicant's characterization of the Venturi effect and

13 its effects on the CST buried piping.

14 CHAIR YOUNG: Am I understanding right?

15 If anything did get in, you're saying once it got to

16 the HPCI or --

17 JUDGE ABRAMSON: RCIC.

18 CHAIR YOUNG: RCIC that it would shut off

19 automatically if the monitor --

20 JUDGE ABRAMSON: Let me see if I can

21 characterize this. I think it's quite simple. In

22 order for this Venturi effect to happen, the pressure

23 in the pipe itself has to drop very low. If the

24 pressure in the pipe dropped that low, the HPCI and

25 RCIC pumps would shut off automatically and therefore

1 it couldn't draw anything in.

2 JUDGE COLE: The pressure has to be

3 negative.

4 JUDGE ABRAMSON: Yes.

5 CHAIR YOUNG: So is that correct?

6 MR. COX: That's correct.

7 JUDGE ABRAMSON: So they wouldn't draw

8 anything in.

9 CHAIR YOUNG: And did you want to follow

10 up to that?

11 DR. AHFIELD: Again, this is -- We're

12 spinning out a hypothetical here. But if there is

13 this temporary perched condition, there could be an

14 above atmosphere pressure in the water.

15 JUDGE ABRAMSON: Yes.

16 DR. AHFIELD: It doesn't necessarily have

17 to be negative.

18 JUDGE ABRAMSON: Yes. Okay. We

19 understand the ramifications of this thing. I think I

20 like --

21 CHAIR YOUNG: But the shutoff question,

22 the shutoff would be caused by the --

23 JUDGE ABRAMSON: By the pressure being

24 low.

25 CHAIR YOUNG: -- pressure being low.

1 JUDGE ABRAMSON: Right, and it's a very
2 complicated computation to try to do it. It depends
3 on the permeability of the soil. It depends on how
4 much water got in there. It depends on how much you
5 could suck out before the pressure dropped which it
6 would eventually do. It's not something one can do.
7 One can speculate about scenarios, but I don't think
8 we can go past that. Is that -- Now I'm not supposed
9 to be testifying here.
10 (Laughter.)
11 JUDGE ABRAMSON: Maybe somebody wants to
12 tell whether I've summarized this right or not.
13 MR. SULLIVAN: We concur.
14 (Laughter.)
15 JUDGE ABRAMSON: Mr. Ahfield.
16 CHAIR YOUNG: He's doctor.
17 JUDGE ABRAMSON: Doctor.
18 DR. AHFIELD: It is -- It would be
19 conceivable to do that analysis. I'm not sure if you
20 were suggesting that it's impossible to do.
21 JUDGE ABRAMSON: No.
22 DR. AHFIELD: I think that analysis could
23 be done. No one at this table has done it.
24 JUDGE ABRAMSON: We understand.
25 CHAIR YOUNG: Do you have any idea on the

1 likelihood of that scenario?

2 JUDGE ABRAMSON: No, it depends on so many

3 things. Now I understand, Mr. Lampert, you wanted to

4 have a dialogue about monitoring wells and let me just

5 say we have a great deal of testimony in front of us

6 and I'm not particularly fond of the idea of having a

7 repetition of all that's in writing before us. If you

8 have something brief you'd like to say about the

9 benefits from monitoring wells in a few minutes,

10 that's fine. Bur I would not welcome a long dialogue,

11 monologue, about the benefits of monitoring wells when

12 it's repetitive of what we've already seen. That's

13 not the purpose of this hearing.

14 CHAIR YOUNG: Let me maybe set this off by

15 a question and that is -- And we did say that since

16 Entergy had opened the door to the comparison of the

17 effectiveness of the aging management systems and the

18 use of monitoring wells that that would not be

19 excluded.

20 So I'm looking at the last substantive

21 paragraph rather than the "I declare" from Dr. Ahfield

22 saying that "groundwater monitoring networks can be

23 used as part of a leak detection system and are widely

24 used for this purpose. Well-established protocols

25 exist with proper design of monitoring networks

1 including well and screen placement, sampling
2 frequency and selection of sample to contaminants."
3 And then you say that "the four well system that
4 Entergy has does not meet what you would consider to
5 be reasonable standards for a monitoring network
6 design."
7 A couple questions. The way this is issue
8 of monitoring wells is in at this point is as to a
9 comparison between the effectiveness of the aging
10 management programs and monitoring wells and Entergy
11 said that their aging management programs are much
12 more direct and much more effective than monitoring
13 wells could be.
14 So I'd like to give you the opportunity to
15 give your opinion on that and also to give your
16 opinion on what level of added value there would be by
17 adding the monitoring well system you're talking about
18 in the context of the safety functions that we're
19 talking about in these contentions, in this contention
20 in these two areas.
21 DR. AHFIELD: Okay. Of course, this
22 testimony that you've quoted from me was written in
23 January when my understanding was that the three
24 components were relevant to the safety function, those
25 being the saltwater service and the CST and the off-

1 gas and the name is escaping me.

2 In any case, the monitoring wells can
3 supplement the various monitoring techniques that
4 Entergy is proposing and add with relatively little
5 cost an additional frequent measurement technique and
6 I think the example we talked about this morning with
7 the saltwater service line is a good one. There you
8 have a case where you have a pipe obviously traveling
9 through the unsaturated soil, a water table beneath
10 it, it's fresh water and that saltwater passing
11 through that pipe if it were to leak would generally
12 migrate downward, would then move laterally with the
13 groundwater and would leave a signature in monitoring
14 wells, I believe. That's a signature of sufficient
15 magnitude, in other words, a change in concentration
16 of chloride or some other substance that would allow
17 one to detect leakage from that particular pipe.

18 And so I think the value added here is the
19 frequency with which one could make this
20 determination, make this testing. We heard this
21 morning of inspection of the pipe, the interior of the
22 pipe, as I understand it, every ten years, inspection
23 of the exterior of the pipe on an occasional basis and
24 then only sort of spot inspection, as I understand it,
25 and that is at a few locations.

1 In effect, the groundwater wells give us
2 an integrated measurement. So if they're properly
3 designed and placed, then a leak anywhere along that
4 line, along that pipe, would be detected by one or
5 more of those wells. So that's really the value
6 added. And as I note in my testimony, I appreciate
7 the interest in not repeating it all, but this is
8 routinely used for all sorts of applications in
9 industry. There are all sorts of protocols depending
10 on type of facility, size of facility, type of or risk
11 of potential leak. There are sort of protocols for
12 how the wells should be designed, how many there
13 should be, how often they should be sampled and so on.
14 CHAIR YOUNG: I think we heard mention
15 earlier today about ruling-making in process on the --
16 Was it on the tritium issue?
17 PARTICIPANT: It was the legacy site.
18 CHAIR YOUNG: Oh, it was it on the legacy
19 sites?
20 MS. UTTAL: We aren't aware of any rule-
21 making.
22 CHAIR YOUNG: Maybe I misunderstood. I
23 thought I heard some reference to --
24 MR. LEWIS: In my opening statement, I
25 refer to a rule-making. The rule-making is entitled

1 "Decommissioning Planning" but, as part of that
2 regulation, it is also proposing to amend Part 20 to
3 require subsurface surveys and I can give you a
4 citation if you're interested, Judge Young.
5 CHAIR YOUNG: Okay. You can include that
6 in your proposed findings and conclusions if you'd
7 like. The reason I --
8 MR. LEWIS: That was my opening statement.
9 As I said, it's outside the scope of the proceeding.
10 I was just trying to explain that.
11 CHAIR YOUNG: Okay.
12 MR. LEWIS: Important stuff outside the
13 scope of the proceeding is not being ignored. It's
14 just being addressed in another arena.
15 CHAIR YOUNG: And that's sort of related
16 to the reason why I was remembering back to that and
17 that is I think one of the initial reasons that
18 Pilgrim Watch, if I can presume, brought the
19 contention was that they were concerned about the
20 monitoring for radioactivity and that the aging and
21 safety aspects of it while they were there they
22 weren't the primary concern.
23 And so my question would be to what extent
24 is the type of monitoring or type of information, the
25 system that you're talking about, to what extent is

1 that addressed or addressed to or more useful with
2 regard to the monitoring for the radioactivity or the
3 monitoring with regard to the safety issues that we're
4 talking about and the reason I ask it is because I
5 think I understand Entergy's testimony to be that the
6 level monitoring that they have and the flow rate
7 monitoring that they have along with the inspection
8 programs that those are more direct and that, and here
9 I'm paraphrasing but anyone can feel free to correct
10 me, any leak that would have a safety impact would
11 have to be so large that it would necessarily be
12 detected more directly through other means.
13 So that essentially, the amounts we're
14 talking about, while the type of monitoring wells
15 you're talking about pick up whether there were small
16 leaks, that the size leaks that they're talking about
17 are so big that it wouldn't serve that significant a
18 function with regard to the safety issues. Does that
19 make sense?
20 DR. AHFIELD: I think it does and I think
21 you've posed several questions and if I may address --
22 CHAIR YOUNG: And did I say that more or
23 less correctly?
24 (No verbal response.)
25 CHAIR YOUNG: Okay.

1 DR. AHFIELD: I first want to clarify what
2 I think can be a confusing point about the purpose of
3 monitoring wells and certainly in many applications in
4 many industries they are used to detect contaminants
5 in the subsurface to prevent pollution, to prevent
6 migration offsite.
7 CHAIR YOUNG: Right.
8 DR. AHFIELD: And that's not the issue
9 here.
10 CHAIR YOUNG: Right.
11 DR. AHFIELD: The notion is that they are
12 to be used here as they are elsewhere for monitoring
13 for leaks so that the leak can be corrected. So
14 that's really quite a different function.
15 CHAIR YOUNG: Right.
16 JUDGE ABRAMSON: Your point being that you
17 would detect them before they got to the level at
18 which they're this kind of safety problem. Is that
19 it?
20 DR. AHFIELD: That's correct. Yes.
21 Now with respect to the saltwater service
22 line, my understanding, and again I'm going to rely on
23 what Mr. Gundersen spoke to this morning and others
24 actually on the other panels, that small leaks can
25 lead, can indicate, corrosion in the steel pipe and

1 for the saltwater now which may lead to its, may
2 indicated that it's losing structural integrity and
3 then maybe impaired or degraded in the design failure
4 event. I'm not sure I'm getting my terms right here,
5 the design --
6 PARTICIPANT: Design basis.
7 DR. AHFIELD: The design basis event. So
8 the notion of small leaks being indicative of a
9 corrosion, small scale corrosion, that may be getting
10 larger is important and may not be detected quickly
11 enough, you see in my opinion, with the relatively low
12 frequency testing proposed by Entergy, the ten-year
13 inspections, for example.
14 CHAIR YOUNG: Did you -- From you've heard
15 today, would you say that the type of monitoring that
16 you are proposing could make a difference in
17 preventing any of the -- serving any of the safety
18 functions that we listed earlier or is it more a case
19 of that it could save the company a lot of money
20 because if they didn't discover it until later they
21 might -- they would be able to shut down or to stop,
22 to address the safety issues, but it would be a lot
23 more expensive. Can you say that it would fall into
24 one or the other of those?
25 DR. AHFIELD: Well, if we can speculate,

1 we were doing some hypotheses with respect to the
2 Venturi effect and all of that, if we can speculate
3 now about a scenario with respect to SSW, the
4 saltwater service line. Suppose there's an
5 inspection, internal inspection. Everything looks
6 fine. But for whatever reason, there is now a leak
7 that develops. Some corrosion starts at some spot.
8 A leak develops. That corrosion spreads. Now this
9 gets into the rate of corrosion which is beyond my
10 expertise.
11 CHAIR YOUNG: Right.
12 DR. AHFIELD: But if that rate were
13 sufficiently rapid, then under this scenario I'm
14 laying out it may degrade the structural integrity of
15 the steel pipe to a point that it would be a safety
16 risk in the event of an earthquake before the next ten
17 year inspection. But I'm suggesting that under this
18 scenario those leaks would be detected by, say,
19 quarterly sampling from a strategically designed
20 network of groundwater monitoring wells.
21 CHAIR YOUNG: So in the end it does sound
22 like, at least, to me at this point, so correct, point
23 out anything I'm leaving out, it does sound a lot
24 depends on the integrity and functionality of the
25 epoxy liner with regard to the salt service water

1 system. Correct?

2 DR. AHFIELD: Well, the -- As I understand

3 it, it's the structural integrity of the steel pipe

4 that is critical in the design basis event.

5 CHAIR YOUNG: Right. But they're relying

6 on the epoxy liner to withstand or to protect against

7 any leaks that would get to the metal of the pipe.

8 JUDGE ABRAMSON: If I can help, Judge

9 Young.

10 CHAIR YOUNG: Articulate it.

11 JUDGE ABRAMSON: What I think Judge Young

12 means to say, I shouldn't be a mind reader, is that

13 Entergy relies upon the epoxy fiber liner to prevent

14 water from inside the pipe getting to the inside of

15 the carbon steel pipe where it could cause corrosion.

16 Is that right?

17 CHAIR YOUNG: Right, and I guess that was

18 the question that what you indicated was that you

19 didn't know about the rate of corrosion and so forth

20 and it sounds as though from what you're saying that

21 there's no question, but that the system that you're

22 proposing could detect leaks earlier and at least one

23 of the main missing ingredients in terms of whether it

24 could prevent a safety issue is the degree to which

25 the epoxy lining would prevent corrosion from starting

1 in the first place and to a certain extent, I think,
2 there was also testimony about how fast it would
3 spread based on the adhesive or the adherence of the
4 liner.
5 DR. AHFIELD: Right. And again, I'm not
6 a corrosion expert, but what I'm hearing and
7 understand is that the corrosion can occur from both
8 inside and outside the pipe.
9 CHAIR YOUNG: Right. You're right.
10 DR. AHFIELD: And to Mr. Abramson's, Dr.
11 Abramson's, question, yes, the epoxy lining contains
12 the water so that we'd have to have a leak in that.
13 JUDGE ABRAMSON: I think we understand.
14 I think certainly I understand and I'm sure Judge Cole
15 understands quite well the benefits of a monitoring
16 well system. So if Judge Young has more to pursue on
17 this, let's carrying on.
18 CHAIR YOUNG: Did you have anything
19 further to say? I mean, I think you understand the
20 question that I'm trying to get at here. In other
21 words, is what you're saying something that would
22 involve maybe it would be wise to do this? But can
23 you say based on -- It sounds like you're saying that
24 you think it's something to consider that might
25 prevent safety functions from being compromised, but

1 that the missing piece that you can't provide is the
2 corrosion aspect of it.
3 DR. AHFIELD: That's correct. I can't
4 provide the corrosion aspect and I think a way to look
5 at this is simply as one of a set of tools. None of
6 them are perfect for monitoring or inspecting the
7 pipe.
8 CHAIR YOUNG: Right.
9 DR. AHFIELD: And, you know, in water
10 supply which I do some of we do a lot of redundancy in
11 water supply protection I should say and water
12 treatment and I presume the same would be true in this
13 case, when several systems that overlap to protect the
14 safety function.
15 CHAIR YOUNG: Right.
16 DR. AHFIELD: So that's the role I see it
17 playing and I don't think it's a -- I'm seeing it as
18 more than just a nice thing to add but instead a
19 crucial part of a full system.
20 Anything else to add, well, again I don't
21 want to elaborate, you know, repeat everything I said
22 here. But my testimony in regards to what is needed
23 is not very, you know, number of wells and so on, is
24 not specific because there's not enough data.
25 CHAIR YOUNG: Right.

1 DR. AHFIELD: There hasn't been typical
2 due diligence on just characterizing. We've heard of
3 17 feet to the water table. It's not 17 feet
4 everywhere I'm sure. It varies from place to place
5 and I just think Entergy probably doesn't know. It's
6 probably an average of 17 feet. So that has to be
7 done and that has to be part of the package.
8 MR. GUNDERSEN: The issue of corrosion
9 rates in the carbon steel pipe on that service water
10 system, I think the record indicates that you can go
11 from nothing to significant hole on the order of two
12 years and we have a ten year inspection plan. So
13 we're hanging our hat on --
14 CHAIR YOUNG: We understand. What's your
15 basis for that, sir?
16 MR. GUNDERSEN: That the photographs from
17 1995 and the evidence this morning, Entergy's,
18 Pilgrim's, discussion this morning said that in '95
19 they looked at it and in '97 they looked at it and
20 then '99, all at once, it was pretty full blown holes.
21 So the holes that we presented in the photographs were
22 nonexistent two years before. That was the basis for
23 that.
24 JUDGE COLE: They had been in the ground
25 25 years at that time.

1 MR. GUNDERSEN: That's correct. But the
2 last time it was looked at was two years before those
3 photographs were taken and there was no problem. So
4 the carbon steel can deteriorate on the order of two
5 years from the time it gets saltwater up against it.
6 JUDGE COLE: But we don't really have an
7 accurate picture of when the last time the individual
8 systems have been looked at.
9 MR. GUNDERSEN: In that photo and I think
10 testimony this morning said they were looked at two
11 years before.
12 JUDGE COLE: We know when most of them
13 have been installed though.
14 CHAIR YOUNG: When did it start?
15 MR. GUNDERSEN: I'm sorry. When I get
16 back to the photo with the quarter in it, two years
17 before that same pipe had been looked at at the same
18 spot and there was no evidence so that --
19 CHAIR YOUNG: Let me interrupt you for
20 just a second just to clarify something there. I
21 thought I remembered that in '95 that they did see
22 some degradation at least of the rubber lining and
23 possibly of the metal that they decided because of
24 that to check it two years later that there might have
25 been some progress, but it wasn't -- There wasn't a

1 hole yet and then two years
2 when they checked it, that's when they discovered the
3 hole.
4 MR. GUNDERSEN: That's correct.
5 CHAIR YOUNG: So there was some
6 progression.
7 MR. GUNDERSEN: Yes. I think I said from
8 between two and four years and yet we're looking at
9 the pipe every ten. So we get back to we relying on
10 the integrity of the SOC, a great analogy.
11 CHAIR YOUNG: Right.
12 MR. GUNDERSEN: Yet the boundary that's --
13 But yet that's really not qualified. I mean, we have
14 industry --
15 JUDGE ABRAMSON: If you have something
16 new, let's hear it. Otherwise let's move on.
17 COMMISSIONER EDWARDS: No. I just wanted
18 to get back on the record the issue of we do know that
19 these pipes fail in less than ten years when exposed
20 to saltwater and that was something Dr. Ahfield
21 brought up.
22 MS. LAMPERT: Could I add one point? My
23 understanding is that it is the burden of Entergy to
24 offer proof.
25 CHAIR YOUNG: That's correct.

1 MS. LAMPERT: Today I've heard opining
2 and, looking at the record, do you really see factual
3 data of we inspected A, B, C, D and E of each system
4 at X date? Then so many, a period later, as you were
5 talking about, we went back to see the progression.
6 Now what is the age of the various segments in the
7 pipe and therefore we were going to ask these
8 questions. Therefore, what basis, what facts have
9 been presented?
10 JUDGE ABRAMSON: Ms. Lampert, if I may.
11 MS. LAMPERT: Certainly.
12 JUDGE ABRAMSON: We've had a lot of
13 written testimony. We've had some oral responses to
14 our questions today. The kind of information you are
15 now trying to present or are wishing to present is
16 perfectly appropriate for your proposed findings. But
17 it's not necessary for us to hear those questions now.
18 They're not going to answer now.
19 CHAIR YOUNG: It is something that's more
20 appropriate for argument.
21 MS. LAMPERT: Okay. I didn't understand
22 that. Now I do.
23 CHAIR YOUNG: Okay. However, you did
24 mention questions and so what I'm going to do is ask
25 Entergy if you have any follow up to what you've just

1 heard about the monitoring well system, about the
2 corrosion progression.
3 MR. SPATARO: If I may, on the corrosion
4 question, at this point in time, the argument is moot.
5 It took 20 years for the rubber to degrade. It took
6 another six years for that degradation to get to the
7 substrate carbon steel and, yes, the carbon steel
8 failed very quickly. At this point in time, we have
9 a practically brand new epoxy liner over a non-
10 degraded rubber liner which then is our double barrier
11 between the saltwater and the carbon steel.
12 Rough estimate, 40, 60 years before any of
13 those liners would start to show degradation and fail
14 and then you would have rapid deterioration of the
15 carbon steel. So that's our case.
16 CHAIR YOUNG: Anything further?
17 MR. SULLIVAN: Relative to the need for
18 monitoring wells, it's our position --
19 CHAIR YOUNG: Right. To follow up on the
20 testimony you've just heard.
21 MR. SULLIVAN: -- that we do not need
22 monitoring wells, that we have adequate surveillances
23 and procedures and specifications for how we do work
24 at the station that do not require monitoring wells in
25 order for us to assure the safe operation of the

1 station in the continued license period.

2 CHAIR YOUNG: Does the staff have anything

3 to offer?

4 MS. UTTAL: I believe all of our arguments

5 are in our testimony including Dr. Davis' testimony

6 that the monitoring wells are not required.

7 CHAIR YOUNG: Ms. Hollis, you have just

8 been sitting and listening all day which is sometimes

9 the hardest thing to do. Did you have anything to add

10 or the Town of Duxbury, either one?

11 MS. HOLLIS: A question and it may be an

12 inappropriate question in the context here, but I've

13 been puzzled with respect to the response on the

14 inspection, the timing of the inspections and the

15 necessity for more inspections in saltwater systems.

16 That's one issue.

17 And then the second is on the monitoring

18 wells and it may be that this is a completely outside

19 the context of this particular panel's interest and

20 jurisdiction to hear. I wonder from Entergy's

21 standpoint. Is the reason for not pursuing additional

22 inspections, for example, as was proposed by Judge

23 Abramson, let's say, during the refueling cycle of

24 segments of the pipe, is that because of cost? Is it

25 because of a precedential effect or what is the reason

1 for not pursuing that as an appropriate middle ground?
2 And then the second would also be related
3 to the question, for example, of the monitoring wells.
4 How much is a monitoring well and how much does it
5 cost to monitor the monitoring wells? I know in other
6 circumstances they have added monitoring wells, for
7 example, in other plant relicensing procedures where
8 Entergy has, in fact, added monitoring wells where
9 they felt it was appropriate in very large numbers,
10 let me say. So I don't know if this is an NRC
11 question or if this is outside the context of the
12 proceeding.
13 JUDGE ABRAMSON: Have you had any direct
14 discussions or has the Town had any direct discussions
15 with Entergy about it?
16 MS. HOLLIS: We have had discussions with
17 Entergy but not on this particular topic.
18 JUDGE ABRAMSON: Perhaps that would make
19 some sense for you to approach them directly and get
20 your answers. We're dealing with only the issues that
21 are in front of us. But those kinds of questions are
22 perfectly appropriate to take up with them and perhaps
23 you will understand what their rationale is and maybe
24 you'll get chances and maybe you won't. I don't know.
25 But that's the way to go with it, I would suggest.

1 MS. HOLLIS: Our cause taken into
2 consideration in the context of the panel's
3 deliberations or is it just the basic issue of the
4 safety and the relationship between the contention and
5 the safety issue?
6 JUDGE ABRAMSON: For us, it's a
7 regulation. Do they comply with the regulation or
8 not?
9 CHAIR YOUNG: Right.
10 JUDGE ABRAMSON: We just read the law and
11 deal with it.
12 CHAIR YOUNG: However, since the issue has
13 been raised, does Entergy have anything that you'd
14 like to say in response?
15 MR. COX: I would add that as Mr. Lewis
16 mentioned in the opening remarks we do believe that
17 monitoring wells are appropriate for dealing with the
18 NEI groundwater protection initiative. But in the
19 context of license renewal as we've testified today,
20 they're not necessary to assure the license renewal
21 intended functions that are defined in 10 CFR 54.4.
22 CHAIR YOUNG: And with regard to the more,
23 the dividing up the segments of the pipe and
24 inspecting them when you have shutdowns or refuelings?
25 MR. SULLIVAN: Our position is that it is

1 unnecessary and it creates a undue burden.

2 CHAIR YOUNG: An undue burden in terms of

3 cost or --

4 MR. SULLIVAN: Cost, safety, risk during

5 a shutdown. We believe that the safest thing for the

6 plant to do is to keep the safety systems in service

7 to the maximum extent possible.

8 CHAIR YOUNG: So doing them all at once,

9 you're saying minimizes the safety considerations and

10 that that's more of an issue to you than cost. Did I

11 understand that right or maybe I'm reading too much

12 into it.

13 MR. SULLIVAN: Yes, you understood it

14 right.

15 CHAIR YOUNG: Okay. Any other follow-up?

16 Have we left anything out?

17 JUDGE ABRAMSON: Does Town of Duxbury have

18 any? You were asked and we're not going to bypass

19 you.

20 CHAIR YOUNG: You're Ms. Chin. Right?

21 MS. CHIN: Yes. The only thing I would

22 add that the Town of Duxbury passed a unanimous vote

23 at their annual town meeting of 2007 that did support

24 monitoring wells and other components that have been

25 discussed today and that vote was forwarded to the NRC

1 and Entergy and there was no response.

2 CHAIR YOUNG: They're here today and so,

3 as Judge Abramson said, any dialogue that you want to

4 initiate or try to follow up on separate from the

5 adjudication proceeding is certainly something that I

6 think is open to you. We can't speak for the rest of

7 the NRC. We're separate from them for obvious

8 reasons, well, maybe not for obvious reasons, for

9 reasons that our fulfilling our function of being

10 independent and neutral and weighing the evidence

11 without fear of favor to any party. So that's what

12 we've tried to do here today and when we deliberate

13 after we've received the proposed findings of fact and

14 conclusions of law we'll approach it from the same

15 standpoint.

16 But any communications between any of the

17 parties and with the NRC staff who are represented

18 here at the table next to you is certainly something

19 that you can follow up on.

20 MS. LAMPERT: Yes, I'd like to make a

21 comment on that. I think conversation is lovely and

22 voluntary programs is wonderful, too. However, I

23 think requirements, written requirements, it's the

24 only thing the public can actually count on.

25 And the second point I would bring forward

1 is that we're making probability guesses about risk.
2 What is the risk of a hole occurring, growing to a
3 certain extent, and impacting safety? That requires,
4 I would think, more than opinions. It requires having
5 past experience, I'd like to finish it please, past
6 experience to look back on which they have very little
7 of and there is no experience for the aging management
8 program going forward nor any reactor in operation of
9 that age. Therefore it is prudent to take a more
10 proactive approach and I think that's what we're
11 suggesting as opposed to, no, we will assume not based
12 on much experience that we're going to wait until the
13 disaster occurs and then we'll worry about it. That
14 does not seem to be that it's officially the role of
15 the NRC which is to protect public safety. That's
16 where I stand.
17 CHAIR YOUNG: I think I had -- we had said
18 in our last order that we wouldn't require closing
19 statements and that's sort of in the nature of a
20 closing statement and that's fine. You've said that.
21 Now as to the timing of any proposed
22 findings of fact and conclusions of law as I mentioned
23 earlier the closing of this hearing has been stayed by
24 the 1st Circuit. We have pending before us a motion
25 from Pilgrim Watch in response to which I presume

1 other parties will be filing responses.

2 Is there anything else that any party

3 thinks we could profitably do here today? I think

4 with regard to both of the other things we're sort of

5 not at a point of closure and the record will stay

6 open. But for today, is there anything else that any

7 party would like to propose we do? Is there anything

8 that's been left out? Is there any --

9 MS. UTTAL: Judge.

10 CHAIR YOUNG: Yes.

11 MS. UTTAL: One point I would like to make

12 is I don't think that the Board has to delay its

13 decision on this contention because of the order

14 issued by the 1st Circuit. The issue --

15 JUDGE ABRAMSON: We'll take the 1st

16 Circuit order under advisement. We're going to look

17 at it. At this point, it is our conclusion that this

18 proceeding needs to be delayed and we'll study it. If

19 you think that that's an erroneously interpretation,

20 we'd be happy to welcome a brief on it.

21 CHAIR YOUNG: Obviously, this is something

22 that literally came in the evening before we left the

23 next morning to come here, in other words, two

24 evenings ago and I happened to be there and get it

25 when it came in and emailed it to my colleagues and I

1 think one of the things we're going to wait for is to
2 see what the State of Massachusetts does and we'll
3 proceed from there.
4 Obviously, any argument that the parties
5 want to make on anything that arises out of this we're
6 not foreclosing those in any way. But this is sort of
7 a new development and we sort of need to see where it
8 goes.
9 What the court said was that the hearings
10 that they would stay the closing of the hearings, in
11 this case and the Vermont Yankee case, until 14 days
12 after the mandate is issued by the court.
13 MR. LEWIS: Judge, if I could be heard on
14 this. I know I can follow up with a position on this
15 and the court's language was ambiguous. It's not
16 clear whether they mean termination of the
17 adjudicatory proceeding or closure of the record. I
18 think they mean the latter because what they wanted to
19 do was allow the Commonwealth of Massachusetts to come
20 as an interested state so that they could file a
21 motion pursuant to 10 CFR 2.802(d), give that some
22 time. It looks like the Commission is going to issue
23 the renewed licenses before a ruling on the petition
24 for rule-making that's pending.
25 But if the Board wants to keep the record

1 open, they can do that. My suggestion would be though
2 that none of this is an impediment to proceeding with
3 proposed findings and that would be useful time spent.
4 CHAIR YOUNG: Well, at this point, the
5 court said they're -- The 1st Circuit Court of Appeals
6 said they're staying the closing of the hearings.
7 There is obviously -- Anyone could argue what they
8 want to about that meeting. But at this point, I'm
9 not willing to close the record in this hearing which
10 is part of this proceeding in the face of the court's
11 order.
12 So let's wait and see what happens next.
13 Presumably something will come from the State of
14 Massachusetts and the parties can argue about the
15 impact of that. But we're not going to close the
16 record now and I don't think it's appropriate to
17 schedule proposed findings of fact and conclusions of
18 law until the record is closed.
19 JUDGE ABRAMSON: Yes. Let me pick this
20 up, putting on my legal judge hat for a moment.
21 It's clear to me that in the absence of
22 further testimony submitted by the Massachusetts
23 Attorney General on this particular contention. No
24 more testimony will be taken except if it's in
25 response to the motion we now have from Pilgrim Watch

1 which we assume you will reply to when you see in due
2 course.
3 So while the record isn't formally closed,
4 there should be no further testimony from any party on
5 this particular contention --
6 CHAIR YOUNG: It's unlikely I think.
7 JUDGE ABRAMSON: -- unless something
8 happens with the Massachusetts Attorney General which
9 I can't predict at this point. So you can certainly
10 start preparing your proposed findings of fact and
11 conclusions of law with the assumption that nothing
12 further will happen. But I don't think we can make
13 that assumption yet and frankly we'll be faced with a
14 very interesting situation should something develop
15 from Mass. AG on this contention.
16 MR. LEWIS: Maybe my suggestion then would
17 be for the parties to start preparing the proposed
18 findings recognizing that if at some point the mandate
19 issues and this record closes the Board may ask for
20 the proposed findings on very short order because to
21 me it doesn't make sense --
22 JUDGE ABRAMSON: I'm okay with that.
23 MR. LEWIS: -- turning a 30 day schedule
24 into a three month schedule.
25 CHAIR YOUNG: You're free to work on them

1 in the interim. I mean, there's nothing to stop you
2 from doing that.
3 JUDGE ABRAMSON: But there's a caveat
4 that's being --
5 CHAIR YOUNG: You're wanting to say that
6 once that mandate is issued that we say we want the
7 proposed findings tomorrow. I think we just have to
8 wait and see what happens at this point. I don't
9 think we're ready to say what we're going to do
10 definitely with regard to closing the record under the
11 circumstances before us now. But we're not going to
12 go away. You know where to find us.
13 (Laughter.)
14 JUDGE ABRAMSON: You can certainly ask the
15 Commission to react to the order it got from the 1st
16 Circuit. Remember that order was issued to the
17 Commission.
18 MS. UTTAL: One more thing regarding time
19 limits. Pilgrim Watch served their motion on us
20 yesterday, I believe, and I would ask the Court to
21 start the ten day period from tomorrow when we all get
22 back to our offices.
23 JUDGE ABRAMSON: That's okay.
24 JUDGE COLE: Sure.
25 CHAIR YOUNG: Starting tomorrow --

1 JUDGE ABRAMSON: Is that a motion?

2 (Laughter.)

3 CHAIR YOUNG: -- that would be good.

4 (Off the record comments.)

5 CHAIR YOUNG: That would be the 21st. Am

6 I counting right?

7 (Off the record discussion.)

8 CHAIR YOUNG: What date is the ten?

9 CLERK: The 21st falls on Monday.

10 CHAIR YOUNG: Monday, okay. How about

11 Monday the 21st for responses?

12 JUDGE ABRAMSON: No work for you because

13 they're the ones that have to do this. Right? You've

14 put your motion --

15 (Off the record comments.)

16 CHAIR YOUNG: All right. Anything else

17 before we adjourn for today?

18 MR. LEWIS: Judge Young, I looked at the

19 photographs. My memory failed me. They weren't in

20 color on our disc. We do have a slightly better copy

21 and I can hand those out if you'd like.

22 CHAIR YOUNG: Okay. That's fine.

23 JUDGE ABRAMSON: Why don't we adjourn?

24 CHAIR YOUNG: Yes, just a second. I just

25 want to say before we adjourn thank you, everyone,

1 thank the parties for being here and being attentive
2 and providing assistance to us in doing our jobs and
3 for those of you in the audience thank you for coming
4 and we hope that you learned something from it as we
5 did and I guess that's all to be said at this time.
6 We'll adjourn and expect to hear from the parties with
7 regard to the other pending matters in the near future
8 and see where that takes us.
9 Thank you all. We can go off the record.
10 (Whereupon, at 5:01 p.m., the above-
11 entitled matter was concluded.)
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## CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Pilgrim Nuclear Power Station Hearing

Docket Number: 50-293-LR

Location: Plymouth, Massachusetts

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.

Eric Hendrixson
Official Reporter
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