

# Official Transcript of Proceedings

## NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
503rd Meeting

Docket Number: (not applicable)

Location: Rockville, Maryland

Date: Thursday, June 12, 2003

Work Order No.: NRC-946

Pages 1-399

CORRECTED COPY

**NEAL R. GROSS AND CO., INC.**  
**Court Reporters and Transcribers**  
**1323 Rhode Island Avenue, N.W.**  
**Washington, D.C. 20005**  
**(202) 234-4433**

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

+ + + + +

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

503rd MEETING

+ + + + +

THURSDAY, JUNE 12, 2003

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The ACRS met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, at 8:30 a.m., Mario V. Bonaca, Chairman, presiding.

## COMMITTEE MEMBERS:

MARIO V. BONACA, Chairman

GRAHAM B. WALLIS, Vice Chairman

GEORGE E. APOSTOLAKIS, Member

F. PETER FORD, Member

THOMAS S. KRESS, Member

GRAHAM M. LEITCH, Member

DANA A. POWERS, Member

VICTOR H. RANSOM, Member

WILLIAM J. SHACK, Member

JOHN D. SIEBER, Member

STEPHEN L. ROSEN, Member-At-Large

**NEAL R. GROSS**COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 ACRS STAFF PRESENT:

2 SHER BAHADUR, Associate Director - ACRS/ACNW

3 RALPH CARUSO, ACRS Staff

4 MEDHAT EL-ZEFTAWY, ACRS Staff

5 MAGGALEAN W. WESTON, Staff Engineer

6 PANEL MEMBERS:

7 DAVID COLLINS, Engineering Analyst

8 CHARLES DUGGER, Nuclear Energy Institute

9 GEORGE FELGATE, Nuclear Energy Institute/  
10 Nuclear Power Operations

11 CLARE GOODMAN, NRC/NRR

12 JACK GROBE, NRC/0350 Panel

13 SONJA HABER, Human Performance Analysis Corp.

14 WILLIAM N. KEISLER, Nuclear Maintenance Int.

15 LEW MEYERS, FENOC

16 THOMAS MURLEY, Safety Consultant

17 WILLIAM O'CONNOR, Fermi 2

18 ALAN PRICE, Millstone/Dominion

19 ASHOK THADANI, NRC/RES

20 D. TRIMBLE, NRC/NRR

21 HOWARD WHITCOMB, III, ESQ.

22 GEOFF WRIGHT

23 AGENCY EMPLOYEES ALSO PRESENT:

24 ZENA ABDULLAHI, NRR/SPXB

25 J. BONGARRA, NRR/DIPM/IEHB

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 AGENCY EMPLOYEES ALSO PRESENT: (cont.)  
2 J. CAI, NRC/NRR/DIPM  
3 C. CARPENTER, NRR/DIPM  
4 J.F. COSTELLO, NRC/RES/DET  
5 R. ECKERODE, NRR/DIPM  
6 FAROUK ELTAWILA, NRC/RES/DSARE  
7 S. TINA GHOSH, ACNW  
8 JON HOPKINS, NRR/DLPM  
9 LISAMARIE L. JARRIEL, NRR/OD  
10 J. KARA, NRC/RES/REHHFB  
11 MINDY LANDAN, NRC/OEDO  
12 DANEIRA MELENDEZ, NRC RIII/DRP  
13 TANYA MENSCH, NRC/PMAS  
14 JOCELYN MITCHELLE, NRC/RES/DSARE  
15 B. MUSICO, NRR/EPHP  
16 HO NIEH, NRC/ OEDO  
17 JAKE PERSENSKY, RES  
18 T. QUAY, NRR/DIPM  
19 ISABELLE SCHOENFELD, NRC/DEDO  
20 D. SKOEN, NRR/DRIP  
21 DEIRDRE SPAULDING, NRR/DLPM  
22 MARVIN SYKES, NRR/SPSB  
23 HANRY A. WAGAGE, NRR/SPLB  
24 GEOFFREY C. WRIGHT, NRC RIII/DRP  
25

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

ALSO PRESENT:

ROBERT C. EVANS, NEI

GEORGE FELGATE, INPO

BRIAN HAAGENSEN, PSHA, Inc.

RICK JANATI, PADEP/BRP

CHARLIE JONES, TECHNIDIGM.ORG

STEPHEN KOFF, Cleveland Plain Dealer

DONA MEINDERTZMAN, Winston & Strawn

THOMAS MURLEY, Safety Consultant

NORM PETERSON, Detroit Edison Co.

BROOKE POOLE, Winston & Strawn

SUSAN G. STERRETT, Duke University

ALI TABATABAI, Link Technologies

SPYROS TRAIFOROS, Link Technologies

GREGORY TWACHTMAN, McGraw-Hill

ANDY VOMASTELI, Dominion

MIKE WOODS, Pittsburgh Post Gazette

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

C-O-N-T-E-N-T-S

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

<u>AGENDA ITEM</u>	<u>PAGE</u>
Opening Remarks by the ACRS Chairman . . . . .	6
Workshop on Safety Culture:	
Panel A - Collective Understanding of	
Safety Culture	
A. Thadani, NRC . . . . .	9
C. Dugger, NEI . . . . .	30
T. Murley, Safety Consultant . . . . .	56
H. Whitcomb, Esq. . . . .	79
W. Keisler, Nuclear Maintenance . . . . .	84
D. Collins, Millstone . . . . .	108
A. Price, Dominion . . . . .	140
Panel B - Attributes of Safety Culture	
Conclusions and Outcome of the Workshop	
D. Trimble, NRR . . . . .	181
C. Goodman, NRR . . . . .	185
G. Felgate, INPO . . . . .	212
L. Meyers, FENOC . . . . .	243
J. Grobe, NRC . . . . .	282
B. O'Connor, Fermi . . . . .	313
S. Haber, HPAC . . . . .	352

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

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

(8:31 a.m.)

CHAIRMAN BONACA: Good morning. The meeting will now come to order. This is the first day of the 503rd meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting the committee will conduct a workshop on safety culture.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John Larkins is the Designated Federal Official for the initial portion of the meeting.

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

A transcript of portions of the meeting is being kept, and it is requested that the speakers use one of the microphones, identify themselves, and speak with sufficient clarity and volume so that they can be readily heard.

Before I turn the meeting over to Dr. Apostolakis, who is the chairman of the safety culture workshop, I would like to simply point out for those of you not familiar with the conduct of ACRS meetings

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

(202) 234-4433

(202) 234-4433

1 that typically the most time we assign to any given  
2 topic in a day is maybe two hours.

3 And today we have assigned a whole day to  
4 one topic, which tells you the interest of the ACRS on  
5 this topic and the importance to the members here of  
6 your views. We are looking for insights, and we have  
7 I think a well-structured agenda to move us through  
8 that.

9 I simply want to point out we have 12  
10 speakers today, and then we have a lot of questions,  
11 I'm sure, from members. So hopefully you'll help our  
12 chairman today of this workshop to make sure everybody  
13 has a chance to give their point of view.

14 With that, I will turn it over to Dr.  
15 Apostolakis.

16 MEMBER APOSTOLAKIS: Thank you, Mr.  
17 Chairman.

18 While the issue of safety culture is of  
19 great interest to this committee and other federal  
20 officials, especially since the incident at Davis-  
21 Besse, there has been a lot that has been written  
22 about safety culture. There is a vast literature out  
23 there on safety culture.

24 I missed the boat. I still don't know  
25 what a good safety culture is or a bad safety culture

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 is, and I suspect that many of my colleagues on the  
2 committee feel the same way.

3 So this unusual workshop, as the chairman  
4 said, is intended to give us a better understanding of  
5 what safety culture means, the words "safety culture"  
6 mean.

7 So we have two panels, as you know. In  
8 the morning we will hear various views on what safety  
9 culture is, hopefully what the good culture is, and in  
10 the afternoon we will hear about what are good  
11 attributes of safety culture, which is a subject of  
12 particular interest to us, because we are not here  
13 only to try to understand what culture is, we are  
14 looking at it from the regulator's point of view.

15 In other words, maybe the licensees may  
16 want to do certain things on their own to improve  
17 their culture, but we are looking at it from the point  
18 of view of, what can the regulator do to perhaps help  
19 the licensees, or monitor certain things, and so on.

20 As the chairman said, we have a crowded  
21 agenda, so I will ask the speakers first to give us a  
22 few words about themselves, why are you here, and  
23 stick to the schedule, please. All of you have half  
24 an hour. I will ask that you speak for about 20  
25 minutes, so we'll have about 10 minutes for questions

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 of clarification.

2 And then, as you know, at the end of each  
3 session we have one hour where we can discuss in a  
4 roundtable kind of mode more general issues.

5 And now I will walk into dangerous  
6 territory and ask my colleagues to try to refrain from  
7 asking questions --

8 (Laughter.)

9 -- during the 20 minutes. I'm willing to  
10 be chastised for that.

11 MEMBER SHACK: Well, I think it's -- I  
12 mean, it's just an unreasonable request.

13 (Laughter.)

14 It's not done, we don't traditionally do  
15 it, and you're asking us to remember to try not to --

16 MEMBER APOSTOLAKIS: I'm just asking. I'm  
17 not directing anybody to do anything.

18 So with that, we'll start with Mr.  
19 Thadani, the Director of the Office of Research of  
20 this agency. Ashok?

21 MR. THADANI: Well, George, I'm here  
22 because I guess I was invited to participate in this  
23 panel. And I thought probably the best I could do  
24 would be to give you a sense of where research has  
25 been in the past, and where are we today.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           And I'll try to be fairly brief in terms  
2 of some of the things that have happened over the last  
3 several years, but I do want to sort of capture a  
4 sense of what's been happening, not just in this  
5 country but around the world. So if I may go to the  
6 first chart, the next one.

7           Today you'll be hearing from three groups  
8 from the agency. Certainly, you'll hear from NRR  
9 later on about specifics of Davis-Besse. So I will  
10 not be going through any details of any of the  
11 specific issues.

12           But let me go back a little bit. It was  
13 after Chernobyl that the International Nuclear Safety  
14 Advisory Group coined the term "safety culture." And  
15 it's documented in INSAG-3, 1988 book, and they call  
16 "safety culture" the following. Let me read you a  
17 part of it anyway. "Personal dedication and  
18 accountability of all individuals engaged in any  
19 activity which has a bearing on the safety of nuclear  
20 powerplants."

21           In 1989, the Commission issued a policy  
22 statement, and they stated the following, and I'm  
23 going to read to you again part of the statement.  
24 "Management has the duty and obligation to foster the  
25 development of a safety culture at each facility and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 to provide a professional working environment in the  
2 control room and throughout the facility that assures  
3 safe operations."

4 The Commission also later on issued a  
5 statement in terms of a safety-conscious work  
6 environment, which I believe is a subset of safety  
7 culture. But I won't say any more about that, except  
8 to note that the Commission again recently asked the  
9 staff to continue to monitor what's happening in this  
10 area.

11 Next chart, please.

12 Soon after INSAG-3 -- when INSAG-3 came  
13 out with its definition, or at least the  
14 characterization of safety culture, there were a whole  
15 range of comments that were received on that. And  
16 subsequently in 1991, INSAG-4 was issued, which  
17 characterized safety culture as you see -- the  
18 definition as you see on the chart.

19 And, of course, over the years some  
20 further refinements have been made and some better  
21 focus has been brought to bear on this issue, and  
22 these are documented in subsequent INSAG reports.

23 I'll share with you what I think are some  
24 of the -- probably the most important elements. I  
25 don't mean to understate the importance of others, but

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 I think there are some elements that seem to me are  
2 particularly important, and I'll go through those.

3 First and foremost is the commitment of  
4 organizations to safety as the most important element.  
5 Second, safety ought not to be compromised for profit.  
6 Third, there needs to be a strong questioning attitude  
7 towards safety. Fourth, and this philosophy must be  
8 communicated in all directions, up, down, sideways.  
9 I think these are -- in my mind, these are some of the  
10 most important elements.

11 Next, please.

12 With this sort of bit of background, in  
13 the mid-'80s, NRC Research Office initiated effort in  
14 the area of organizational factors, and in the mid-  
15 '80s published a document called "Organizational  
16 Analysis and Safety for Utilities with Nuclear  
17 Powerplants." This was sort of an extensive empirical  
18 analysis relating mostly to organizational factors.

19 Subsequently, with the support of  
20 Brookhaven, and Sonja Haber in particular -- I know  
21 she's here, is going to speak to the committee later  
22 on -- was the principal author, published a report  
23 called "Influence of Organizational Factors on  
24 Performance Reliability." And this was focused,  
25 again, on organizational factors, but on data

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 collection and the analysis aspects.

2 And I recall some of the discussions, and  
3 I know George was part of those discussions, how can  
4 one really utilize this information? It was work that  
5 was not complete, but where do we go at that point?  
6 Tom Murley was actively engaged at the time as well  
7 trying to see if some of these parameters could be  
8 screened to a place where the agency could use them in  
9 its decisionmaking.

10 In the early days, in those days, we used  
11 to have what we called "systematic assessment of  
12 licensee performance," where we're trying to  
13 understand how best to integrate these concepts. The  
14 other part that we thought it needed, and George was  
15 engaged in this area, was how to bring in risk-  
16 informed thinking also in addressing these  
17 characteristics.

18 This led to Idaho holding a workshop to  
19 identify factors and assess the technical basis for  
20 modeling influence and how one could convert that into  
21 some sort of risk analysis approaches and to be able  
22 to assess impact of safety culture on plant safety.

23 About this time we -- the decision was  
24 made that this was a very difficult area for the  
25 agency to be engaged in, and that it wasn't clear what

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 research was going to really lead to. And so the  
2 research was terminated at this point, and the  
3 decision was made that we aren't really going to a  
4 mode of monitoring what is happening out there.

5 I won't really go into any of the -- what  
6 the industry has been doing, because I know you will  
7 hear from the industry. So let me go on to the next  
8 chart.

9 But I do want to say a little bit of the  
10 international effort -- I know Tom has been quite  
11 engaged, so I'll be extremely brief on these. But I  
12 do want to note that IAEA has really been a leader in  
13 this area. They published lots of reports. I talked  
14 about INSAG is the forerunner. There are a whole  
15 bunch of technical documents that the IAEA folks have  
16 written.

17 And they also play an active role in  
18 providing service to various member countries when  
19 there are issues of -- potential issues of safety  
20 cultures and how one might go about doing self-  
21 assessments, and so on.

22 NEA has issued a number of reports. I  
23 won't say any more. I actually brought some copies,  
24 and I notice Tom has -- he is one of the authors, I  
25 believe, of these reports.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           But I do want to point out that within  
2 NEA, within the Committee for Safety of Nuclear  
3 Installations, there is a group called the Special  
4 Experts Group on Human and Organizational Factors.  
5 And that group has been tasked to take a look at this  
6 issue and to see what practical things could be  
7 developed, and that group is currently engaged in this  
8 area.

9           And as you know, the NEA and IAEA have  
10 hosted a number of workshops, and so on, and in fact  
11 last week there was a workshop, and Bill Travers was  
12 there, and the focus of the workshop was to look at  
13 specific operating events which had implications in  
14 terms of safety culture issues.

15           Next chart, please.

16           Besides the international organizations,  
17 we have certainly been also keeping a look to see  
18 what's happening in various countries. And as I  
19 suspect you know that several countries are really at  
20 different levels of what I would call engagement in  
21 the area of safety culture.

22           In fact, some of the early work that was  
23 done by NRC Research, early work by Sonja Haber, was  
24 enhanced further and has been utilized by several  
25 countries, starting with Canada early on, Spain, also

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 Ukraine has utilized these approaches. And, as you  
2 know, most recently at Davis-Besse this approach has  
3 been utilized.

4 I will not go through what the specifics  
5 or what the countries are doing, but, anyway, just to  
6 indicate that in some cases they have very specific  
7 requirements, particularly in the case of Finland. In  
8 other cases, there is sort of what I would call fairly  
9 general considerations of safety culture.

10 Go to the next chart, please.

11 I've said this before to the committee in  
12 other venues, but it seems to me that there is really  
13 nothing more important than paying attention to  
14 operating experience.

15 We at the Office of Research took a look  
16 at a selected set of events covering the period of  
17 1992 to 1997. We picked 37 most important events, and  
18 these events were based on our accident sequence  
19 precursor analysis. And we tried to understand the  
20 causes. What were the underlying causes of some of  
21 these events? And we found some rather interesting  
22 insights.

23 You see some of the -- on the chart some  
24 of the drivers. Obviously, the percentages go well  
25 above 100 percent, because we don't -- it's hard to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 try to distinguish at that level as to what the real  
2 root cause is. But it was pretty clear that they were  
3 driven by some considerations of human factors, if you  
4 will.

5 An interesting insight was some concerns  
6 with corrective action programs, repetitive errors,  
7 potentially indicative of a number of root causes one  
8 can go through. But, again, it pointed out the  
9 importance, and I must say I was more convinced once  
10 I realized that the events we were talking about  
11 themselves were important to begin with.

12 So I continue to think this is clearly an  
13 operating experience. I think he's saying that this  
14 is an important area that does need attention,  
15 particularly by the industry. And then, I'll come  
16 back and say I think regulators have responsibilities  
17 as well.

18 Next chart.

19 Going into these -- continuing on into  
20 these operating experience issues, I suspect most of  
21 you are familiar with some of these better-known  
22 international events which have relationship to issues  
23 of safety culture. You know, Philippsburg had a  
24 couple of situations having to do with boron  
25 concentration in the tank as well as the level issues.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           There was tendency to ignore these  
2 irregularities because these were believed to be --  
3 oh, they're not very important in terms of safety,  
4 nevertheless. And there was an investigation, and the  
5 root causes were believed to be human factors related  
6 issues. And, actually, a number of personnel actions  
7 were taken at Philippsburg.

8           Brunsbuettel is this issue of explosion in  
9 the hydrogen piping connected to the primary vessel,  
10 and again tendency, in spite of some indications of  
11 the operator, to continue to operate the plant at  
12 power. And it did lead to an inquiry and follow-on  
13 actions by the German government.

14           TEPCO -- I suspect you know a number of  
15 issues relating to aging effects and core internals  
16 issues.

17           Dampierre -- during '99 and 2000, they  
18 kept having a whole bunch of events. And once they  
19 started to dig into it again, they got down to this  
20 issue of underlying -- some of the underlying factors  
21 were procedural human-related things that we often  
22 talk about.

23           Paks is certainly the most recent one,  
24 where you know they -- there has been some fuel  
25 failure, cleanup process that they were engaged in,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 ballooning, cracking, fragmentation, fuel perhaps.  
2 And, again, it seems to indicate -- obviously, this is  
3 most recent and we don't know for sure what the root  
4 causes are, but it appears that there is a lack of  
5 understanding of safety. And some actions certainly  
6 were taken which led to the situation that they are  
7 in. We'll wait and see what comes out of it.

8 Next one, please.

9 Let me -- I will not talk about the  
10 specific events at U.S. plants except to really note  
11 these events seem to be characterized by procedures  
12 and processes, issues of commitment, communications,  
13 and use of operating experience.

14 And my own concern -- let me repeat what  
15 I said earlier. I do worry about potential for  
16 complacency, perhaps taking things for granted. And  
17 the whole issue of inquiring mind or questioning  
18 attitude I think is really, really critical in my  
19 view.

20 And let me note when I say that, I don't  
21 mean just for the utilities industry. I think it  
22 applies to the regulator just as equally to have that  
23 kind of a challenging and inquiring attitude about the  
24 issues.

25 And let me add to this, it's important to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 have sound technical foundation. That understanding,  
2 good fundamental understanding of safety I think is  
3 very important. And this dedication that says that  
4 safety really is number one, and so those are some  
5 things that in my mind they're critical.

6 So the question then we keep asking  
7 ourselves, well, can we -- and when I say "we," I  
8 don't just mean the regulator or research  
9 organization. As a nuclear community, can we develop  
10 some sort of measures and means to be able to  
11 proactively understand what's going on, and be able to  
12 take preventive measures before things get much worse?  
13 I think there is also great economic incentive to do  
14 that.

15 Well, let me go on to my next chart. I'm  
16 trying to stay very close to George's admonition here.

17 So in conclusion, let me note that,  
18 consistent with Commission guidance, we have been  
19 monitoring and really looking to see what's happening  
20 out not just in this country but internationally.

21 As I have indicated, safety culture has  
22 been an important certainly influencing factor in what  
23 has happened and is happening. And that it is  
24 important for us, as nuclear -- I will say again as a  
25 nuclear community, to understand early, and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 particularly persistent, signs of deteriorating  
2 performance.

3 And this points to, again, the need for  
4 looking for some mechanism, some sort of performance  
5 indicators, or some other guidance that one can  
6 develop that would be not only valuable to the  
7 industry but would also be valuable to regulators in  
8 understanding.

9 And, finally, we are currently taking a  
10 hard look -- "we" meaning both the Office of Research  
11 and NRR -- are taking a hard look at this information  
12 that I briefly describe to you, along with what you're  
13 going to hear later on from the staff to see, where do  
14 we go next? And we're just in the assessment mode.

15 Thank you very much.

16 MEMBER APOSTOLAKIS: Thank you, Ashok.

17 Any questions for Mr. Thadani?

18 MEMBER ROSEN: Yes.

19 MEMBER APOSTOLAKIS: Okay. Steve?

20 MEMBER ROSEN: Yes, thank you.

21 Ashok, you had a slide early on on the  
22 operating event analysis. The title is "Operating  
23 Event Analysis: NUREG/CR-6753." Can we go back to  
24 that?

25 Can we go back to a slide in Ashok's --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the one entitled "Operating Event Analysis" --

2 MR. THADANI: It's number 7.

3 MEMBER ROSEN: -- "NUREG/CR-6753." One  
4 more, one more, keep going. Oh, go back.

5 MEMBER APOSTOLAKIS: It was number 7?

6 MR. THADANI: Yes, number 7.

7 MEMBER ROSEN: All right. Now, in our  
8 handout, you don't have -- it doesn't have the last  
9 bullet that's on your slide, and you did not comment  
10 on that bullet. Found that the ROP does not identify  
11 many of these errors.

12 MR. THADANI: Yes, this is an issue -- as  
13 you know, there is -- and when the cornerstones --  
14 when you get down to it, the whole issue of human  
15 errors, and particularly some cross-cutting issues,  
16 are a difficult part. It is difficult to see how to  
17 capture these. And this is what I was talking about  
18 earlier with stepping back, looking to see, what can  
19 we do?

20 Is there some reasonable approach we can  
21 come up with which could be used both -- there are two  
22 parts. You have the -- industry will do its thing,  
23 and I'm sure you'll hear about that from regulators  
24 you have. Do you have some mechanism such as  
25 indicators that might give you some information?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           Second question you have to ask yourself,  
2 well, if you don't have indicators, then is there some  
3 mechanism such as inspection? Is there something you  
4 can do within inspection that will help you uncover  
5 some of these problems?

6           And I'm saying today it's difficult.  
7 We're not able to do this, and --

8           MEMBER ROSEN: At what point on this slide  
9 is it the ROP does not now lead us that way?

10          MR. THADANI: It's not able to capture  
11 what I just described to you. That's correct. That  
12 is correct.

13          MEMBER APOSTOLAKIS: On this subject?  
14 Because we have Peter, Graham, and I believe, Dana,  
15 you wanted to --

16          CHAIRMAN BONACA: I raised my hand already  
17 before.

18          MEMBER APOSTOLAKIS: Okay. Peter?

19          MEMBER LEITCH: I had a question on this  
20 particular slide, if you want to take me --

21          MEMBER APOSTOLAKIS: Go ahead.

22          MEMBER LEITCH: -- while we're there.

23                 Ashok, I was wondering about operating  
24 practices. You speak about design practices,  
25 maintenance practices, and management and supervisory

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 practices. Are operating practices assumed in some of  
2 those other three categories? Or did they fall less  
3 than 30 percent?

4 MR. THADANI: I would ask Jay, just so  
5 that -- because I don't know a specific answer to your  
6 question. Jake, can you respond to that?

7 MR. PERSENSKY: Jake Persensky from the  
8 Office of Research. This is just a subset of the  
9 number of root causes that we did identify in that  
10 report. There were some operating events or operating  
11 practices that are involved here, but what we were  
12 finding in this report was we had like a four-to-one  
13 margin for latent errors. Most of those latent errors  
14 were in these categories as opposed to the more active  
15 errors that you find in the operating experience.

16 MEMBER LEITCH: Okay. So you're focusing  
17 primarily on latent errors here.

18 MR. PERSENSKY: Well, I did in this  
19 particular slide. But it's because the data showed  
20 that most of the events, if you go back and look into  
21 them and do a detailed analysis, have multiple root  
22 causes, multiple human causes or human errors in it.  
23 Most of them that we were finding -- like I said,  
24 about four-to-one -- were not in the operations but in  
25 these other areas.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER LEITCH: Okay. Thank you. I  
2 understand.

3 MR. THADANI: Graham, you are right.  
4 Basically, it is -- it was the latent errors. That  
5 was the driver.

6 MEMBER LEITCH: Thank you.

7 MEMBER SHACK: Let me ask just a question  
8 of clarification here. It says organizational factors  
9 contributed, and then it says, okay, here are these  
10 work practices and things like that. Is there  
11 something I'm missing here? Are these, by definition,  
12 organizational factors? Or are we just talking about  
13 human errors here?

14 MR. THADANI: Let me characterize this  
15 basically as human errors. I think there is this  
16 confusion of language as to what we mean. Let me  
17 stick with human errors as the real issue, I think.  
18 And there can be certain factors, and they could be  
19 organizational, that can drive issues.

20 MEMBER APOSTOLAKIS: Peter? No?

21 MEMBER KRESS: I have one on this slide.

22 MR. THADANI: You have certainly seen the  
23 UK license condition number 36, and I think there is  
24 a clear connection there.

25 MEMBER KRESS: I'm glad you are looking at

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the ASP program, because it's the only place I know  
2 who we can measure the importance --

3 MR. THADANI: Yes.

4 MEMBER KRESS: -- of safety culture.  
5 However, I think what we've done falls short of being  
6 quantitative. These are root quantitative, but  
7 they're really qualitative.

8 The question I would have is: this is a  
9 view across the board of all the plants, because  
10 you're doing it with all of the licensing event  
11 reports. And you're looking at significant events in  
12 the sense that they have some sort of relationship to  
13 core damage frequency.

14 And my question is: can we quantify that?  
15 I'm not really certain that these safety culture  
16 events are not well enough controlled by design and  
17 the things -- regulations we already have to the  
18 extent that they have an acceptable impact on CDF.

19 And that's the question. Is there some  
20 way to take this information and go that next step and  
21 say, like in 1.174, how much CDF affect does it really  
22 have?

23 MR. THADANI: I think that's a difficult  
24 statement, in my view. Before an event happens, if  
25 you ask me to come up with an estimate, I'd say that's

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 a pretty tough call. But after an event happens, I  
2 can certainly come up with conditional probability.

3 MEMBER KRESS: And add them up.

4 MR. THADANI: Right. And I can come up  
5 with conditional probabilities to give me some sense  
6 of relative importance. Just the event happened.  
7 Whatever happened did happen, so I -- I'm only looking  
8 at the conditional part, which is a little easier to  
9 quantify.

10 MEMBER KRESS: Let me give you a followup  
11 question, then. Does that now say that if you indeed  
12 wanted to have a regulation having to do with safety  
13 culture, does that not make it almost impossible to do  
14 a regulatory analysis?

15 MR. THADANI: It would be very difficult  
16 to do a regulatory analysis, because if you say a  
17 regulatory analysis has to be quantitative, it's  
18 tough.

19 MEMBER KRESS: Well, it does.

20 MR. THADANI: It is tough.

21 MEMBER KRESS: That's part of the --

22 MR. THADANI: Oh, that's an element.

23 MEMBER KRESS: Yes.

24 MR. THADANI: But, I mean, it doesn't mean  
25 that the agency can't make decisions because it can't

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 quantify certain things. I mean, there are other  
2 examples. This happens to be one of those.

3 MEMBER KRESS: So it may not be possible.

4 CHAIRMAN BONACA: I have just one  
5 question. Your concluding slide, Ashok, twice speaks  
6 of the interest of the staff in monitoring, evaluating  
7 international activities in developing objective  
8 measures that serve as indicators of plant safety  
9 concerns.

10 And then, you also speak about the  
11 importance of understanding, and then developing maybe  
12 a performance indicator or other regulatory guidance.  
13 Have we seen anywhere, you know, in international  
14 activities, and so on, some indication of some  
15 quantitative measures that are being used?

16 MR. THADANI: Quantitative measures I have  
17 not seen.

18 CHAIRMAN BONACA: Quantitative, no. No  
19 qualitative?

20 MR. THADANI: Qualitative, yes. But I  
21 haven't seen --

22 CHAIRMAN BONACA: Okay.

23 MR. THADANI: -- quantitative.

24 MEMBER APOSTOLAKIS: Any other questions?

25 MEMBER RANSOM: Just a real quick comment.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 It would be interesting to hear the views, but has  
2 deregulation in the power industry been a factor in  
3 safety culture?

4 MR. THADANI: I would say that our focus  
5 -- there are two parts. Let me address it in two  
6 ways. We've been pretty focused on grid reliability  
7 issues since deregulation. And we are seeing some --  
8 we are getting some interesting insights. I'll use an  
9 example.

10 We find that the frequency of loss of off-  
11 site power has been going down since deregulation. I  
12 don't want to give direct connection necessarily  
13 either, but observation. And we've also found  
14 something else, that because of the -- who is in  
15 charge of generation, distribution, and operation  
16 aspects, that recovery of off-site power seems to be  
17 taking longer, because there are questions of, who is  
18 in charge, how long does it take to get the  
19 communication issues taken care of?

20 So I can tell you that we're seeing a few  
21 signs, but we're not seeing anything so significant  
22 that we ought to be moving quickly. But we're still  
23 taking a look at it.

24 MEMBER APOSTOLAKIS: Okay. Thank you very  
25 much, Ashok.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           The next speaker is Mr. Dugger of the  
2 Nuclear Energy Institute.

3           MR. DUGGER: Well, thank you very much.  
4 And I have some slides coming up, I think.

5           MEMBER APOSTOLAKIS: Would you tell us a  
6 little bit about yourself?

7           MR. DUGGER: Certainly. I'm currently  
8 working at the Nuclear Energy Institute, and I'm on  
9 loan as the VP of Operations from Energy Corporation  
10 to NEI. And my background is site vice president,  
11 general manager, and many manager positions within  
12 various plants within Entergy and a few other  
13 utilities.

14          MEMBER APOSTOLAKIS: Okay. Thank you.

15          MR. DUGGER: I really appreciate the  
16 opportunity to come and speak on this particular  
17 topic. It's a topic of great import to the industry,  
18 and I'm in the unique position to speak not only for  
19 NEI but also a little bit for the industry also.

20                 When I was reviewing the panel members  
21 here, I think we have a real good opportunity to cover  
22 this topic, and we might actually draw some conclusion  
23 from it. And with 30 minutes, I think we really have  
24 to focus in on what we in particular think is  
25 important.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           Would you give me the first slide, please?  
2           And if you'll click four times, that will -- there we  
3           go. There we go.

4           I'd like to start by making a series of  
5           statements that will either -- you'll either agree  
6           with or not agree with, but I think it will help  
7           structure our walk through our discussion on safety  
8           culture here.

9           The first should be obvious to everyone --  
10          safety culture starts at the very top of an  
11          organization. We all follow the leader. If the  
12          leader says that safety is important, then it is. If  
13          the leader doesn't say that, then it isn't.

14          Safety culture is a continuous challenge.  
15          We can probably all name plants or have been at plants  
16          where the culture has slipped. As a site VP, this was  
17          a continuous worry. Are we putting enough emphasis on  
18          safety culture? Are we just looking at where we have  
19          been rather than continuous improvement?

20          Safety culture is at best a slippery  
21          thing. To understand where an organization is on  
22          safety culture we really have to look at the entire  
23          organizational structure and the underpinnings of  
24          management. Is there management engagement? Are they  
25          spending enough time in the plant? Is there a strong

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 corrective action program?

2 What are the performance indicators doing?

3 Do the people in the field know the management team?

4 And the questions go on and on.

5 We may part ways here, but I believe the

6 industry has done a tremendous amount in the area of

7 safety culture. I believe that safety culture has

8 improved. And at the risk of being accused of looking

9 backwards, the industry has come a long way.

10 Next slide, please.

11 I believe there is a place for regulation

12 in the broader theme of safety culture, not so much to

13 regulate culture itself but more the components of

14 safety culture. And then, finally, I don't believe

15 there is a place for direct regulation of safety

16 culture, so let us explore these statements further

17 and see if they stand up.

18 Next slide, please.

19 Safety must lead all other goals -- is a

20 very easy statement to make. And I doubt that you

21 will find any CEO or CNO or site vice president that

22 would say anything else. Almost every nuclear

23 organization has a vision statement, and a high-level

24 goal that states safety is number one.

25 So if this is the case, then we'll never

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 have any other problems with our plants. But we know  
2 that's not true.

3 Although the statement is there, it's how  
4 the statement is applied that counts. The way senior  
5 management behaves will determine how the organization  
6 behaves. And it takes more than just a platitude or  
7 a value statement to drive an organization. The  
8 values must be demonstrated by management.

9 Next slide, please.

10 So let's take a look at a few values.  
11 Here are some representative values that one might  
12 find in a nuclear organization. On the surface, all  
13 of these seem reasonable, and we would probably  
14 believe easy to apply. But, again, if that's true,  
15 then we, again, wouldn't have any more plant problems.

16 Next slide, please.

17 So if high-level goals, platitudes, and  
18 values won't by themselves do the trick, what will  
19 drive a safety culture? To really get a better view  
20 of how a safety culture develops and is maintained,  
21 we'd have to take a more global look.

22 These are not all the things we'd look at,  
23 but these things that you see up here give a  
24 representative view of what we should look at for  
25 safety culture. Communications, alignment, and the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 rest set the stage for potentially a solid safety  
2 culture.

3 Notice there is no magic here. There is  
4 nothing but the way people manage an organization and  
5 prepare an organization to perform.

6 Next slide, please.

7 So let's start with communication. One  
8 indicator of safety culture is how accessible  
9 management is to the workforce. Does senior  
10 management attend the daily meetings and provide input  
11 to those meetings? Are there multiple forums for  
12 employees to ask questions and get answers from these  
13 people that set policy and have a higher view of the  
14 organization?

15 Does management go out in the plant and  
16 get a first-hand feedback on the message they have  
17 been delivering? Are people aware of the message?  
18 And does management keep trying, through multiple  
19 forums, to ensure that message is delivered?

20 This is not an easy task for an  
21 organization that has rotating shift work, training  
22 cycles, and other things to contend with. One  
23 important aspect of developing and maintaining a good  
24 safety culture is management's ability to get out and  
25 develop a relationship with the workforce.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Trust and integrity are necessary  
2 components to good communication and management.  
3 Going out to the workforce in the work areas gives  
4 management an opportunity to exhibit the standards and  
5 expectations they talk about through demonstration.  
6 This adds emphasis to the message and credibility to  
7 the management team.

8 Management must be willing to address  
9 employee concerns, and not just the ones that deal  
10 with safety but all concerns. That way, when a hard  
11 concern does come up that deals with safety or some  
12 other contentious issue, the relationship is already  
13 developed. Communication is practiced, and there is  
14 an expectation and confidence that the issue will be  
15 addressed and resolved.

16 Next slide, please.

17 In every organization there are barriers  
18 to communications. These barriers are sometimes at  
19 the supervisor level and often times at other levels.  
20 All it takes is someone that doesn't believe the  
21 message or doesn't communicate well with the group,  
22 and that layer is formed.

23 This can be cultural from years of the  
24 same person supervising a group or from promotions  
25 within that perpetuate the same communication

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 problems. Clay layers will prevent the organization  
2 from achieving the alignment needed to ensure that the  
3 organization has the right view of safety culture.

4 This is important when trying to educate  
5 the organization on certain issues, such as reactivity  
6 management. Mechanists, chemists, plant service  
7 people all affect reactivity management. And if the  
8 message is not made clear and doesn't get through that  
9 clay layer and alignment on that issue is not  
10 achieved, then a vulnerability exists that could  
11 affect safety culture.

12 People have to understand how they can  
13 affect the safety of the plant. Management has to  
14 verify that that message has been received. The goals  
15 and vision of an organization must be understood top  
16 to bottom, and this isn't a case of verbatim repeat  
17 back. It's a case of understanding.

18 Next slide, please.

19 Continuing with the global look, we can  
20 tell a lot about an organization by looking at the  
21 self-assessing and benchmarking capability that that  
22 plant has done or the utility has done. A strong  
23 safety culture requires that a plant look outside  
24 their organization to see what others are doing.

25 Being able to measure yourself against the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 best helps an organization grow. You have the  
2 opportunity to bring best practices back to your  
3 organization, as well as share the best practices that  
4 you know.

5 An inward approach to plant management can  
6 create a stagnant or declining organization. The  
7 plant can be left behind as the industry moves  
8 forward. A good self-assessment organization at least  
9 will appear to have a good safety culture, but it  
10 takes a little more. It's not enough to just go look.  
11 You have to act on the information that you bring  
12 back.

13 Management, again, has the responsibility  
14 to probe the benchmarking effort and find out what's  
15 been brought back. Given that it's good material,  
16 then management has the responsibility to drive that  
17 change. Effective change management will determine  
18 how much of a positive or a negative effect that  
19 change has on the organization.

20 Without good change management, you can  
21 almost bet the results will be bad. Good change  
22 management can be a whole discussion by itself, so  
23 we're not going to go forward with that. But change  
24 management is an overall good safety culture aspect  
25 and part of what we're talking about here today.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Next slide, please.

2 The next component of a strong safety  
3 culture I would like to discuss is human performance.  
4 Back during the '80s and early '90s, we were trying to  
5 improve plant performance, and for the most part we're  
6 successful by addressing the material condition of the  
7 plants, fixing problems that had plagued the industry  
8 for quite a while, and reducing outage duration.

9 The improved material condition and  
10 problem resolution could only take us so far. The  
11 second great step the industry took was to address  
12 human performance aspects of plant operation, and I  
13 mean the big operation, not the operations group.

14 We realized with much effort that we were  
15 not training people to be aware of human performance  
16 issues. Procedures were not structured correctly.  
17 There were traps in maintenance and operational  
18 activities that set workers up to make errors.

19 By addressing these issues and giving the  
20 workers the tools to identify traps, we were able to  
21 reduce the human performance error rate and learn from  
22 our experiences as we went. And we shared those  
23 experiences through the industry.

24 Performance in this area is monitored by  
25 several methods that collectively give a picture of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 human performance. Management presence in the field  
2 doing -- performing observations, tracking error  
3 precursors in the corrective action program, and  
4 tracking errors per number of hours worked are a few  
5 of the measures used to map human performance.

6 Overall, by focusing on the results, we  
7 get a pretty good picture of human performance and its  
8 effect on safety culture.

9 Next slide, please.

10 Of all the indicators the industry has  
11 used over the course of time, the industrial safety  
12 indicator has given us the best look of what's going  
13 on in an organization. Industrial safety is an  
14 indicator of how the standards of an organization are  
15 accepted by the workforce.

16 Do people wear their safety equipment? Do  
17 they help others in their workgroup remember to wear  
18 their protective equipment? Are the number of first  
19 aid cases seen as a precursor to greater injuries?  
20 Although industrial safety is a small component of  
21 safety culture of an organization, it speaks volumes  
22 about the internal aspects of the organization.

23 Before human performance became a focus  
24 for the industry, industrial safety was the measure of  
25 things to come in plant operations.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1                   Next slide, please.

2                   The last component of safety culture I'm  
3 going to discuss is training. One of my favorite  
4 leaders in the nuclear industry once told me that if  
5 I want to see what my organization and plant will look  
6 like in five years, go take a look at training today.

7                   Training is the best opportunity we have  
8 as an industry to establish the right expectations for  
9 performance, to set the right standards for work, to  
10 train people on human performance techniques and  
11 generally establish the right safety culture within  
12 the organization.

13                  Training has to be the cornerstone of  
14 performance at the plant. If training falters or is  
15 neglected, the culture of the plant suffers. There  
16 are many examples of this in the industry. I'm sure  
17 you're familiar with all of them.

18                  Safety culture is dependent on a strong  
19 training program, and management must, once again,  
20 observe training to ensure the right standards and  
21 expectations are trained on. Then, management must  
22 observe performance in the plant to ensure the lessons  
23 are carried forward into the plant.

24                  Without this verification step, management  
25 does not have a good feel for the safety culture of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the workers or whether there is a declining trend in  
2 safety culture issues.

3 Next slide, please.

4 We have discussed some of the components  
5 of safety culture and find a common thread throughout.  
6 The common thread is the management of the  
7 organization. Safety culture is, at best, an  
8 amorphous concept. Safety culture requires constant  
9 pressure from management with a sensitivity of how  
10 change affects the organization.

11 We can train on the right things, do all  
12 of the observations, and track all of the performance  
13 indicators just to have safety culture undermined by  
14 poor management focus and performance. If management  
15 fails to communicate, changes the organizational  
16 structure without thought to change management,  
17 promotes too often from within, changes the  
18 relationship with the bargaining unit, or just  
19 generally relaxes, safety culture can be affected.

20 As a site vice president, I am constantly  
21 worried about communications going out to the  
22 organization, whether we were changing rapidly enough  
23 or not changing fast enough. Without good management  
24 awareness of the organization, a declining safety  
25 culture can be the result.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Next slide, please.

2 We discussed some of the ways that we  
3 measure components of safety culture, and I hope by  
4 now you can see that there are a lot of measures that  
5 give a piecemeal look at the safety culture of a  
6 station. To help round this out, let me discuss  
7 several more that individually do not reflect the  
8 actual state of safety culture but that collectively  
9 give us a better look.

10 The general plant performance indicators  
11 that we all track as an industry, such as capacity  
12 factor, forced outage rate, chemistry parameters,  
13 contaminated floor space, give us some more insight  
14 into the safety culture of a plant.

15 Corrective action programs can be sliced  
16 and diced to show the categories of errors,  
17 precursors, failures, potential failures, procedure  
18 deficiencies, and the list goes on. And this all  
19 gives us a better view of the safety culture of the  
20 plant.

21 The human performance indicators and how  
22 the organization reacts to those human performance  
23 indicators give even more insight, and certainly  
24 surveys that reveal to us whether a worker will  
25 approach a supervisor with a safety issue or not gives

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 us a little more insight.

2 And the external looks from assessments,  
3 visitors, INPO evaluations, assist visits with INPO,  
4 safety review committees, and the NRC, help the  
5 picture to develop even further. But nothing takes  
6 the place of management in the plant interacting with  
7 the workers and verifying that the message of  
8 standards and expectations has been heard and is  
9 practiced for determining the safety culture of the  
10 plant and its management.

11 Next slide, please.

12 Regulation already exists that monitors  
13 the peripheral aspects of safety culture. Baseline  
14 inspections monitor the effectiveness of programs on  
15 how the expectations of management are met. The  
16 oversight process looks at a variety of performance  
17 indicators and the trend of programmatic controls.  
18 Though not a direct view of safety culture, it  
19 certainly monitors the results of safety culture in  
20 the organization.

21 Every inspection looks at the inputs of  
22 the performance indicators to ensure that guidance is  
23 followed and that accuracy is maintained. Management  
24 visits from the region, a tour of the plant, and  
25 discuss with workers and management, give another

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 broad look at safety culture. Even the day-to-day  
2 observations of the resident inspectors give insight  
3 into the safety culture of the plant.

4 As a licensee, many times the observations  
5 from the inspectors gave us a heads-up insight that  
6 caused us to redirect the staff to improve safety  
7 culture. What would additional regulation do, and  
8 would it be effective?

9 Next slide, please.

10 I think that safety culture is, thus, best  
11 handled through the interaction of the licensee  
12 management staff. Flexibility is needed to change  
13 management techniques in keeping with the other  
14 cultural aspects of an organization. New employees  
15 need to be trained differently than the more seasoned  
16 employees. Company changes that can create negative  
17 aspects on safety culture are best handled through  
18 comprehensive change management programs where one  
19 size does not fit all.

20 The NRC and Commission should focus on  
21 results and the indicators that exist today. They  
22 should look at the various aspects of the corrective  
23 action programs, employee concerns programs, and draw  
24 a conclusion about the safety culture of the plant.

25 Root causes can give some insight into the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 safety culture without undermining the efforts of  
2 management to change an organization. Regulation  
3 generally sets the minimum standard for performance.  
4 Once regulation could be -- overregulation could be  
5 detrimental by leading an organization to that minimum  
6 standard.

7 This is a subjective issue that does not  
8 play well in our new, more objective regulations that  
9 we're moving towards.

10 The industry has been effective in  
11 managing a very soft issue. Performance has shown the  
12 improvements. If the results of this meeting are a  
13 recommendation to the Commission, then my input is to  
14 tell them that rulemaking in this area of safety  
15 culture does not make sense.

16 Thank you.

17 MEMBER APOSTOLAKIS: Thank you very much.

18 Dana?

19 MEMBER POWERS: Yes, I've got a question,  
20 and I have to admit that I'm not sure how to formulate  
21 the question. Okay?

22 MR. DUGGER: Sure.

23 MEMBER POWERS: But you began your talk  
24 making two important points, and one is that nearly  
25 every institution that I know of, not just nuclear

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 powerplants, will assure me in no uncertain terms upon  
2 visiting them that safety is their number one  
3 consideration, and that that's a lot. If it were  
4 true, they would shut the thing down and never do  
5 anything. And who is their number one consideration?

6 MR. DUGGER: You bet.

7 MEMBER POWERS: And the question, really,  
8 then comes down -- is, how does one balance the  
9 considerations of safety against all of the other  
10 demands on the organization to produce something, and  
11 what not. And what I'd like to pursue just a little  
12 bit with you, because of your experience, is something  
13 specific, and that specific thing that gets mentioned  
14 all the time in connection with safety culture is a  
15 questioning attitude.

16 And the problem that I have with a  
17 questioning attitude is that it seems to me that if I  
18 am an employee of an organization that aspires to a  
19 questioning attitude -- and I am -- that it is simply  
20 a trap for me, that if something bad happens to me the  
21 bumper sticker can be right, you know? That the  
22 management will come back and say, "Well, you didn't  
23 have a questioning attitude."

24 On the other hand, if I stop doing things  
25 because I start asking ever and ever deeper questions,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the management comes back and slaps me around the head  
2 and says, "Well, you're not very productive."

3 So could you pursue that a little bit? I  
4 mean, when does a questioning attitude get in the way?  
5 And when is it the right thing to do? Or is it simply  
6 something that we can only answer after the fact?

7 MR. DUGGER: You know, questioning  
8 attitude is not a tool that is something that we  
9 easily understand. As a young reactor operator or  
10 building operator, when I was with the Carolina Power  
11 and Light System, it was not something that just came  
12 easily to me to question why we did things one way or  
13 another or why the material condition existed the way  
14 it was.

15 It was something that I had to be trained  
16 in, and it was the training that I got through  
17 observation of management that helped me understand  
18 what a questioning attitude was. And it was through  
19 many training sessions and workshops such as this  
20 where we discussed the factors of safety culture and  
21 how to generate a good workforce and develop a good  
22 workforce where questioning attitude really came to  
23 play. And many of those were through the Institute of  
24 Nuclear Power Operations.

25 The fact is, or as I see it, that we have

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 to train our workers on questioning attitude, and we  
2 do that by being a senior manager or being a vice  
3 president or general manager or superintendent  
4 supervisor, sitting in meetings and advising and  
5 coaching and helping people understand where they  
6 should be asking questions, and training them on that  
7 questioning attitude.

8 Otherwise, you know, I can ask questions  
9 all day. You know, I can look at a procedure and say,  
10 "Gee, why did we write it this way? Why didn't we  
11 change this word?" And certainly mechanisms exist to,  
12 you know, through a process to change procedures or  
13 change words or change process, but that's not  
14 productive, and management does have a role to  
15 maintain productivity.

16 But management also has a role in being  
17 able to determine when an issue is something they have  
18 to respond to or when they tell the person, "That's  
19 good insight. Thank you very much," and we'll write  
20 up a procedure change document or we'll write a  
21 corrective action report and go address that.

22 We should never turn off our employees  
23 from asking questions. We should encourage them to  
24 ask questions, but we also have a job to do. And many  
25 of the jobs that we do are time-dependent in the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 industry. When we're running surveillances or  
2 performing maintenance activities, some of those  
3 activities require close coordination with other  
4 groups.

5 So to head off a lot of that questioning  
6 attitude that could occur, one of the mechanisms that  
7 the industry has developed -- and it's not just the  
8 nuclear industry -- and certainly we didn't get this  
9 just -- we didn't just make this up, but we observed  
10 it through the aviation industry and other places --  
11 is the use of very good pre-job briefs that cover all  
12 aspects of the job from industrial safety to  
13 procedures to questions that people have about the  
14 procedures, so we can cover all that and get it out of  
15 the way.

16 And sometimes people believe that those  
17 pre-job briefs are too timely and time-consuming and,  
18 you know, are way too detailed for the activity that's  
19 going to take place. But it helps establish that  
20 mentoring of the people, and it helps establish the  
21 focus of the organization from a safety culture  
22 standpoint.

23 And it allows that individual to raise  
24 that question in a non-combative environment before  
25 the activity takes place, so that he has the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 opportunity to get an answer. Many times corrective  
2 action documents are generated out of that, procedure  
3 changes are generated out of that, mechanisms of  
4 monitoring or looking at that activity or change based  
5 on those pre-job briefs, and then the activities  
6 performed and all of the questions are answered before  
7 we get there.

8 If there's too many questions, that  
9 activity will be postponed. That activity will be  
10 stopped, and we'll back up and retrench and take a  
11 look at what that employee is talking about. They are  
12 our best ears and eyes in the plant, so we try to pay  
13 attention to them.

14 MEMBER APOSTOLAKIS: I have a question.

15 MR. DUGGER: Sure.

16 MEMBER APOSTOLAKIS: You made a strong  
17 argument that also others have made that senior  
18 management is really the key to a good safety culture.  
19 And I'm willing to go along.

20 MR. DUGGER: Okay.

21 MEMBER APOSTOLAKIS: But then I find  
22 myself having problems with that. Your slide 14 with  
23 the title "Working on and Improving Safety Culture"  
24 says nothing about senior management. I mean, if  
25 that's the key, why didn't you say anything here? Why

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 didn't you put something in your bullets?

2           And then, I'll go one step beyond that.  
3 If this agency accepts your argument, then we know  
4 what a potential vulnerability is. If senior  
5 management at a particular facility does not set the  
6 right tone, then things will happen. So we know that.

7           But at the same time, we know that we have  
8 to stay away from it, that we are not supposed to  
9 regulate management. So are we finding ourselves,  
10 then, in the position where we know of a potential  
11 vulnerability but our hands are tied?

12           MR. DUGGER: I think, first of all,  
13 addressing the slide that you got exactly the point  
14 that I intended from the slide, and you obviously got  
15 the fact that I think management is the key to a good  
16 safety culture. I don't think your hands are tied.  
17 I think there is many ways to address the management  
18 of a station and management of safety culture at a  
19 station.

20           Through my interactions with regional  
21 administrators through the various reports that we get  
22 through the cross-cutting observations that we get in  
23 the reports at individual sites, we see comments about  
24 culture, we see comments about human performance. So,  
25 obviously, this is being observed at some level.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           And they are drawing these conclusions  
2 based on doing what we do, which is to take a hard  
3 look at the corrective action program, to take a hard  
4 look at the root cause analyses that are being  
5 performed at a station.

6           And if they're not particularly  
7 comprehensive, or there are activities going on at a  
8 utility where they're not being identified and rolled  
9 into their corrective action program, or that  
10 corrective action program is not being timely in  
11 resolving those issues, that shows up in the report  
12 also, and we may get some type of finding associated  
13 with that.

14           So I don't think your hands are tied at  
15 all. I think that your -- I think you have all the  
16 leeway you need today to go forward and regulate the  
17 industry and push for better safety culture.

18           Now, obviously, this has been pretty  
19 successful to date, with the exception of a few  
20 indicators that the performance of the units has been  
21 tremendously improved over the past 10 years.

22           MEMBER APOSTOLAKIS: By the way, on 15 --  
23 just one last point. On 15, you say that regulation  
24 is already there, and one of the bullets says  
25 inspector observations.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. DUGGER: Yes.

2 MEMBER APOSTOLAKIS: I believe these are  
3 not part of the regulations.

4 MR. DUGGER: I think that can be true,  
5 that we get insight from our resident inspectors that  
6 are not regulation-driven, and that we value that  
7 input. We highly value that input; let me put it that  
8 way. That these are people that are in the plant  
9 sometimes more often than management, observing in the  
10 control room and observing specific activities in the  
11 plant, again sometimes more often than management.

12 And they provide very good insight. If  
13 they see something is changing and they can't  
14 understand why it's changing, or they see an  
15 expectation that's not being met, and they bring that  
16 to management attention, that is real value added to  
17 safety culture of a station.

18 MEMBER APOSTOLAKIS: Steve?

19 MEMBER ROSEN: Let me agree with you, that  
20 I think you have -- the industry has been successful  
21 over the years in managing this issue in the main.  
22 However, it's not the main that we're worried about.  
23 It's the outlier. And it's the outlier that we have  
24 -- is the reason why we're here today, one particular  
25 outlier.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           But I think you need to think about your  
2 presentation in that sense. One of the ways to do  
3 that is to look at the same slide 14, which is about,  
4 how does an organization measure safety culture? And  
5 how would we measure it to find the outlier? What  
6 data would we get to find the outlier?

7           We are already getting plant performance  
8 indicators. We don't get a very clear -- here at the  
9 agency I'm talking about, and particularly I'm talking  
10 about ACRS. We don't see a clear portrayal of the  
11 corrective action categories, and we have almost no  
12 visibility of the human performance indicators. So  
13 those are sort of bold assertions of mine.

14           Can you tell us, just for example, maybe  
15 for some of my colleagues' benefit maybe more than  
16 mine, because I do see these in some interactions I  
17 have with people and organizations in the industry,  
18 what human performance indicators you think are  
19 important, and that we should maybe monitor in a more  
20 direct way than we do now.

21           MR. DUGGER: The human performance  
22 indicators that I think are particularly valuable to  
23 me and that I would use at a plant are really the --  
24 we monitor errors per number of worker hours, and we  
25 look at those errors in various categories. You know,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 sometimes they lead to a failure, and they're a  
2 significant error.

3 But more often than not they're an error  
4 that is a precursor to something else, and it's being  
5 able to take the information that you get from those  
6 precursors errors and being able to roll that back  
7 into the organization that -- where the benefit lies  
8 from that. It's not just the indicator and monitoring  
9 the indicator.

10 It just tells you that, you know, you've  
11 got .15 errors per 10,000 hours work. And, you know,  
12 although that's of some value, that doesn't really  
13 help your organization any at all. It's what has  
14 created those errors, and what you do with that  
15 information, that counts.

16 So if you're seeing a lot of errors,  
17 particularly in procedure compliance or people are  
18 suddenly making valve manipulation errors, or  
19 something of that nature that is -- does not create a  
20 real plant problem, but is a precursor that could  
21 create a plant problem, then that's something worth  
22 monitoring and worth measuring.

23 MEMBER ROSEN: So now in our three-part  
24 communication, I've asked you a question, you answered  
25 it by saying errors per number of worker hours, is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 that correct?

2 MR. DUGGER: Errors per number of worker  
3 hours, that's correct.

4 MEMBER ROSEN: Now, that means that we  
5 should see that in some way, or the agency should see  
6 it and report to the ACRS when we ask about how a  
7 plant is doing, but we don't. I think that's just a  
8 useful thing to think about.

9 MEMBER APOSTOLAKIS: Okay. Any other  
10 burning questions? Thank you very much, Mr. Dugger.

11 MR. DUGGER: Thank you.

12 MEMBER APOSTOLAKIS: The next speaker is  
13 Dr. Murley. Tom, you have a lot of slides. Do you  
14 want to go over -- okay.

15 DR. MURLEY: No. There are far too many  
16 slides there, and I'll just go through --

17 MEMBER APOSTOLAKIS: So what qualifies you  
18 to be here?

19 (Laughter.)

20 DR. MURLEY: I have lots of free time.

21 (Laughter.)

22 MEMBER ROSEN: We question your judgment  
23 to spend your free time here.

24 (Laughter.)

25 DR. MURLEY: For those who don't know my

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 background, I retired from the NRC staff in 1994. I  
2 was Regional Administrator in Region I from 1983 to  
3 1987, and that's where I formed a lot of my original  
4 ideas about -- it wasn't called safety culture then,  
5 but that's what it turned out to be.

6 And then, from 1987 until 1994, I was  
7 Director of Nuclear Reactor Regulation, worked closely  
8 with Ashok at that time.

9 I'd like to start with -- I have thought  
10 deeply about this issue for many years, and so I'll  
11 share my thoughts and how they arrived.

12 As Ashok Thadani said, the INSAG, the IAEA  
13 expert panel, in 1986 mentioned safety culture, but  
14 they didn't really define it or talk about it very  
15 much. And I was at an IAEA conference in 1988, and  
16 Herb Kouts was there. I was in the audience. Herb  
17 Kouts was talking, and some Russian members asked  
18 Herb, what did you mean by "safety culture"? Because  
19 he was on the INSAG at that time.

20 And Herb said, "I don't know." And then  
21 he turned to me and said, "Tom, what do you think?"  
22 And I hadn't really put my thoughts together, so that  
23 got me to think about and put my thoughts together.  
24 And in the next year, 1989, was the first regulatory  
25 information conference.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           And I led off the conference with a paper  
2           titled "Developing a Safety Culture," and that's the  
3           first time I know of that anything was written on  
4           just, what is safety culture? What does it mean?  
5           What are some attributes? And it stemmed, as I said,  
6           from my experience as a regional administrator in  
7           Region I.

8           And there's one interesting chart from  
9           that talk that I gave that I thought I would mention  
10          to you. I call it the Plant A/Plant B comparison, and  
11          it became moderately famous among the staff about --  
12          because it illustrated, what do we mean by two  
13          different cultures? And at the time, for example,  
14          plant-specific simulators weren't required, and some  
15          utilities didn't have them.

16          And there's a lot of attributes on Plant B  
17          that we saw every day at plants in that era. And,  
18          likewise, we saw attributes of Plant A, and they were  
19          very mixed. And the point I made at the conference  
20          was most of these plants meet NRC's regulations, still  
21          do probably, except for the simulator.

22          And the point I wanted to make was that  
23          they're not equally safe. That's self-evident. We  
24          didn't know how to quantify it. We didn't know what  
25          to do. But this started the dialogue about how one

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 should look at safety, and particularly the regional  
2 inspection staff found this chart to be very  
3 interesting. I went to each of the regions and talked  
4 about this concept.

5           Okay. That was 1989. The nuclear  
6 industry was not very comfortable with that concept  
7 back then. I wish they were as enlightened as Chuck  
8 was just now in his discussion, but they weren't. And  
9 the Commission, in fact, was not easy with that  
10 concept, and at a Commission meeting the staff was  
11 told in so many words, "Don't use that concept." In  
12 fact, I was told, "Don't even use that language."

13           So safety culture then went by the  
14 wayside. It wasn't in our regulations. We didn't  
15 need it. We did -- we looked at many of the  
16 attributes that were on these Plant A/Plant B kind of  
17 things, but within the context of the current  
18 regulations at the time.

19           The IAEA continued with their effort.  
20 They put out a number of booklets on developing safety  
21 culture. The Swiss Regulatory Agency, in 1997, put  
22 out safety culture in nuclear installations. Whole  
23 forests have been developed or lost to writing about  
24 safety culture now.

25           And even INPO has reports that touch on

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 safety culture. And I was very pleased to see that at  
2 the December 2002 INPO CEO conference Chairman Meserve  
3 talked about safety culture in an NRC perspective. So  
4 at long last, safety culture is back from the  
5 graveyard of forbidden lexicon in this country, and  
6 oh, be still my heart.

7 (Laughter.)

8 I am pleased to hear that.

9 The way I got back into this topic,  
10 George, was that the Nuclear Energy Agency in Paris,  
11 OECD, has a committee on nuclear regulatory  
12 activities, which I'm sure you know. Sam Collins  
13 represents NRC.

14 But there are senior regulators from all  
15 agencies of OECD countries. And in 1998, I was asked  
16 to be the facilitator of a report, a task group, and  
17 write a report on regulatory approach to safety  
18 culture issues. And that's what I'll talk about  
19 today.

20 And you've got the pamphlets in front of  
21 you. There's two of them. The first one was the role  
22 of the nuclear regulator in promoting and evaluating  
23 safety culture, and the second one was, what happens  
24 if you don't have a good safety culture?

25 Steve's point about the outlier, you're

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 exactly right. If we could go by averages, things  
2 would be fine. But it's the outlier that can cause  
3 accidents in this country.

4 The ideas in these booklets are from many  
5 people in the task group. They're not only my ideas.  
6 I wrote the pamphlets, and I agree with them, but it  
7 was approved by the full CNRA and it is, in fact, a  
8 Nuclear Energy Agency publication. And I don't speak  
9 for NEA or CNRA. The reports speak for themselves.

10 CNRA members were generally agreed that  
11 regulators could not regulate safety culture directly.  
12 In other words, that was a premise of writing these  
13 reports, what was behind it.

14 Ashok has mentioned license condition 36  
15 in the UK. I've looked at that. I've talked with  
16 people, and it's really just a small, tiny part of  
17 safety culture.

18 Main themes in the reports are, I would  
19 say, four. One is that safety culture is essential  
20 for safety. Second theme is, how can you promote good  
21 safety culture? How can a regulator promote good  
22 safety culture? These, by the way, are written for  
23 the regulator.

24 I think anybody can find them useful to  
25 read, but they're aimed at the regulators of OECD

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 countries. And in that sense, they're unique. Most  
2 of the other reports you find on safety culture are,  
3 what are the attributes, and how can you develop those  
4 attributes? This is different.

5 A third theme is, how can a regulator look  
6 for signs of a weak safety culture and the signs of  
7 declining performance that flow from a weak safety  
8 culture? And then, finally, a theme is, what are  
9 appropriate regulatory actions to take to intervene  
10 before declining safety culture leads to actual safety  
11 problems?

12 So that's the background, then, of these  
13 reports.

14 I'll zip through a few slides, George, and  
15 then I'll --

16 MEMBER APOSTOLAKIS: That's fine.

17 DR. MURLEY: -- stop and ask questions.

18 We know now that a good safety culture is  
19 essential for overall nuclear safety. I suppose  
20 there's still some debate about that, I don't know,  
21 but I'm very encouraged to hear my colleagues here at  
22 the table talk about the recognition of the  
23 importance.

24 The regulator has a role to play in all of  
25 this, because the relationship between the regulator

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and the operator can influence an operator safety  
2 culture either positively or negatively. I won't  
3 dwell on that. It is discussed in the report. The  
4 safety regulator has to have its own safety culture.  
5 Imagine that.

6 NRC has no other job but to be worried  
7 about safety, and yet it's nonetheless important that  
8 NRC have a good safety culture. And it's not a given.  
9 That is, it's not all that matters, if that's the  
10 case.

11 Regulatory body should set a good example  
12 in its own performance. Technically competent, high  
13 safety standards, good judgment, and deal with  
14 operators in a professional manner. If that -- those  
15 are essential, it seems to me. If the NRC or any  
16 regulator is going to hold an operating company, a  
17 utility, to high standards, they've got to exhibit at  
18 least these minimum standards themselves.

19 And here again, we list some attributes of  
20 a good safety culture. Other people can speak better  
21 about these than I can, I'm sure, but I think they are  
22 generally accepted now. Most pamphlets that I read,  
23 most reports I read, talk about some combination of  
24 these attributes. And Mr. Dugger's slides had many of  
25 them in there as well.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1           But I do agree with you, Mr. Chairman,  
2           that it's -- even though you can write the attributes  
3           down, it's not easy to go in and look and say yes or  
4           no. And that's why I think at the end of the day  
5           there was not -- there was no consensus that one can  
6           really regulate safety culture, because it's so -- to  
7           do it even approximately correctly, a regulatory  
8           agency would have to be so intrusive that they would  
9           almost take over operation of the plant.

10           That's my view, I think, and that's why if  
11           we could regulate safety culture I would like to do  
12           it. But I don't think it's practical.

13           So a large part of these booklets has to  
14           do with -- if you can't do that, what can you do as a  
15           regulator? And there are many things. You can look  
16           for signs, and there's whole pages in here discussing,  
17           what are some signs of possible weaknesses in safety  
18           culture?

19           This is the model that these pamphlets are  
20           based on. Namely, that if a weak safety culture  
21           exists, then that will lead to declining safety  
22           performance, and that, in turn, will lead to safety  
23           problems. And that it's not as clean-cut as these  
24           boxes indicate, but you can intervene at either stage  
25           here.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   And it depends, really, on the philosophy  
2 of the --

3                   MEMBER APOSTOLAKIS: Which stage is that  
4 -- you said "either stage."

5                   DR. MURLEY: You can intervene either  
6 here, George, or --

7                   MEMBER APOSTOLAKIS: Oh, okay.

8                   DR. MURLEY: And that means you have to  
9 look for signs of safety culture.

10                  MEMBER APOSTOLAKIS: Yes.

11                  DR. MURLEY: Or you can wait until that  
12 manifests itself in declining performance. These are  
13 easier to recognize.

14                  MEMBER APOSTOLAKIS: Right.

15                  DR. MURLEY: That chart shows regulatory  
16 intervention at this latter stage, but it can be done  
17 at either stage. And it -- the books discuss how one  
18 might go about that.

19                  MEMBER POWERS: Don't we do it the other  
20 way around? That when we see either safety problems,  
21 an event occurs, or we get some massive information  
22 about declining performance, many events occur, small  
23 events occur.

24                  DR. MURLEY: Right.

25                  MEMBER POWERS: But then we conclude there

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 must be a weak safety culture?

2 DR. MURLEY: That's usually how it works,  
3 yes. But it doesn't have to work that way. One can  
4 look -- again, I don't want to go into all of the  
5 details, but you can look and find weak ALARA  
6 programs. Postings around the plant aren't very good,  
7 sloppiness. You can look for those kinds of things  
8 and then try to put them together, and you don't have  
9 to wait for events, even small issue events.

10 Now, I recognize that's tricky. That  
11 makes the regulator very intrusive, but you can do it.

12 MEMBER POWERS: No, I don't think you can.  
13 I mean, if I come in and I say, "Find something that  
14 I, as an observer, find is weak" --

15 DR. MURLEY: Yes.

16 MEMBER POWERS: -- and there's no tech  
17 spec or condition of operation I can write up against,  
18 I can't say anything about it.

19 MEMBER SIEBER: No, you can't.

20 MEMBER POWERS: I have to find  
21 something --

22 DR. MURLEY: Yes.

23 MEMBER POWERS: -- you could write up  
24 against.

25 DR. MURLEY: Yes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER POWERS: And if I can't find  
2 anything, there is --

3 MEMBER APOSTOLAKIS: Evidently, that's not  
4 the way it works, Dana. We were told yesterday at --  
5 Tuesday that -- and I think Mr. Dugger confirmed it,  
6 that the regional staff can bring up issues that are  
7 not necessarily in the regulations, and the utilities  
8 are usually very -- always responsive.

9 MEMBER POWERS: I can bring up anything I  
10 want to. I can't write it up.

11 MEMBER APOSTOLAKIS: And they can write it  
12 up.

13 DR. MURLEY: That's true. Maybe some  
14 people in this room might recall my days as a regional  
15 administrator, but I didn't feel --

16 MEMBER APOSTOLAKIS: No.

17 DR. MURLEY: -- particularly constrained.

18 MEMBER APOSTOLAKIS: We have letters that  
19 they do write it up.

20 DR. MURLEY: Yes.

21 MEMBER APOSTOLAKIS: They do write it up.

22 DR. MURLEY: You can take enforcement  
23 action.

24 MEMBER POWERS: That's the whole thrust of  
25 the ROP. All those Level 4 findings are now

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 disappearing.

2 MEMBER APOSTOLAKIS: There is a lot going  
3 on with the first column of the ROP that we were not  
4 aware of, a lot, and we --

5 MEMBER POWERS: We can discuss it later.

6 MEMBER APOSTOLAKIS: -- we will, yes.

7 MEMBER POWERS: But how many regions have  
8 we been to? How many inspectors have we talked to  
9 that say, "I'm curious about this. I'm bothered by  
10 this. But I can't write anything up because I can't  
11 find a regulation to write it up against, or it  
12 doesn't make the ROP"?

13 MEMBER APOSTOLAKIS: That was not a  
14 message we got the other day. Maybe things have  
15 changed. I don't know.

16 MEMBER POWERS: But it's the message we've  
17 consistently gotten from now four regions.

18 MEMBER APOSTOLAKIS: Not from Region I.

19 MEMBER POWERS: This is a recent visit to  
20 Region I. We've been to Region I before, and we got  
21 an earful. I taught a class in Region I the other  
22 day, and I got more than an earful on this.

23 MEMBER SIEBER: My experience is more on  
24 the line of Dana's otherwise. When things are written  
25 up in your report, they're based on a regulatory

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 requirement.

2 MEMBER APOSTOLAKIS: Yes.

3 MEMBER SIEBER: On the other hand,  
4 briefings can be further afield.

5 MEMBER APOSTOLAKIS: Is there a regulatory  
6 requirement that we could take a correction -- a  
7 corrective action now? It has to be effective, and  
8 the same thing should not happen a year from now? I  
9 don't know that there is a regulation, and yet I have  
10 six letters here to the vice presidents that point  
11 that out.

12 So things have changed, it seems to me.  
13 People do write up things that -- but I think we're  
14 getting away from -- we are interrupting Tom too much.

15 MEMBER ROSEN: I want to interrupt to ask  
16 you a question about this slide, because to me it's --  
17 the way you've portrayed it is simply not good enough.  
18 The endeavor we are engaged in here, the safety of --  
19 the public's health and safety, and reasonable  
20 assurance thereof, seems to me not adequately served  
21 to allow declining safety performance before a  
22 regulatory intervention. So that leads me very  
23 quickly to the question of detecting weak safety  
24 culture.

25 MEMBER APOSTOLAKIS: I think, Steve --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER ROSEN: And that declining safety  
2 performance is a slippery slope whose slope you don't  
3 know. It can be much steeper than you think. And,  
4 therefore, I'm over on the left-hand side trying to  
5 intervene based on a weak safety culture, before the  
6 signs of declining safety performance are evident to  
7 everyone.

8                   And I think you said it could be done.  
9 It's hard, you said, but some things that are hard are  
10 worth doing.

11                  DR. MURLEY: I didn't want to get into it,  
12 because it's -- but one can take regulatory actions  
13 earlier when you've got change conditions that  
14 indicate they may be a weak safety culture. Again, I  
15 have to refer you to the pamphlet, because it does  
16 acknowledge that, Steve, that there is the possibility  
17 of regulatory intervention early. It depends on what  
18 the regulator wants to do.

19                  MEMBER APOSTOLAKIS: Your previous slide,  
20 Tom, was really very interesting. But I think you  
21 need to massage your words a little bit. Let's go  
22 back to the previous slide.

23                  DR. MURLEY: Yes.

24                  MEMBER APOSTOLAKIS: For example, in the  
25 first box, weak safety culture. I mean, you are not

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 really -- you don't mean the whole culture. You are  
2 identifying weak safety culture attributes. I mean,  
3 no licensee would be, you know, bad at everything. I  
4 mean, that would be an extreme case.

5 But you can identify, like you said  
6 earlier, ALARA and other things that you pointed out.  
7 And declining safety performance, yes, is really a red  
8 flag for us. I would say if -- I don't know how  
9 familiar you are with the action matrix of the revised  
10 oversight process. This really you have to be on the  
11 left, the licensee response column.

12 CHAIRMAN BONACA: But this doesn't say  
13 declined 70 -- it says declining. So there is an  
14 implication of a trend --

15 MEMBER APOSTOLAKIS: Yes.

16 CHAIRMAN BONACA: -- and some intervention  
17 somewhere in that trend. So, I mean, if you are still  
18 at a level where you cannot perceive any decline in  
19 safety performance, and you want to intervene, I think  
20 it's an impossibility. It means that you don't have  
21 enough indication to even see it.

22 So I think you have to take it -- you  
23 know, is not really -- there is a continuum there, the  
24 way I see it from --

25 MEMBER APOSTOLAKIS: And also, we have to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 understand better what regulatory intervention is --

2 DR. MURLEY: Keep in mind, I wrote this  
3 for an international --

4 MEMBER APOSTOLAKIS: Yes, I --

5 DR. MURLEY: -- group.

6 MEMBER APOSTOLAKIS: -- appreciate that.

7 DR. MURLEY: And they don't have the same  
8 system as NRC does.

9 MEMBER APOSTOLAKIS: That's right.

10 DR. MURLEY: By far.

11 MEMBER APOSTOLAKIS: I know.

12 DR. MURLEY: And so these are kind of  
13 generic terms.

14 MEMBER APOSTOLAKIS: Yes, yes.

15 DR. MURLEY: To illustrate the concept.

16 Well, I'll move on, and briefly the -- it  
17 talks about periodic safety assessments that a  
18 regulator can do. It talks about early signs of  
19 deteriorating performance. Now you ask, what can they  
20 be? And there's whole pages in these books that  
21 describe specific examples of deteriorating  
22 performance in each of these areas that a regulator  
23 can look for.

24 And not only was I a former regulator  
25 writing this, but there were many, many very good

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 experienced people on this task force. Sam Collins I  
2 mentioned. Roy Zimmerman was on it for a time. And  
3 people from the UK, from France, from Sweden, Germany,  
4 so it had a lot of good, thoughtful input to it.

5 MEMBER POWERS: I guess I'm struggling a  
6 little bit. I look at that list, and I look at  
7 dominant -- risk-dominant accidents, and I don't see  
8 much of a relationship between the two.

9 DR. MURLEY: Well, there are. That is,  
10 these have to be pegged to safety and regulatory  
11 requirements. I mean, they have to have a legal  
12 foundation, and that foundation has to be safety.

13 On this one chart, I don't have room,  
14 Dana, to go into --

15 MEMBER POWERS: Well, I'm sure of that.  
16 But what I'm asking you is suppose my documentation  
17 was abysmal, like it typically is on the -- their  
18 design basis for fire protection. That doesn't affect  
19 -- it's not evident to me that that affects the  
20 incidence of fire at a plant.

21 DR. MURLEY: It may not. And I don't  
22 think you would take any single item like that by  
23 itself. But you would look at every one of these  
24 areas -- the idea is you would -- the inspector would  
25 look for a whole sign of attributes in the operations

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 area -- I mean, just to give you -- in the reports,  
2 each one of these items has a whole list of specific  
3 examples -- valve misalignments, electrical/mechanical  
4 system misalignments.

5 And what an inspector does is look for  
6 instances of this, and then they put it all together.  
7 I don't know, have any of you ever heard of SALP?

8 MEMBER POWERS: Yes.

9 (Laughter.)

10 But usually with some derogatory adjective  
11 right before it.

12 (Laughter.)

13 DR. MURLEY: It's a cromagnum concept.

14 (Laughter.)

15 MEMBER APOSTOLAKIS: Isn't that, though,  
16 an important dimension to this that perhaps we are not  
17 emphasizing enough? I mean, we will always find  
18 errors in operations or in procedures, or whatever.

19 DR. MURLEY: Sure.

20 MEMBER APOSTOLAKIS: I'm really interested  
21 in whether these are systematic and they are, in fact,  
22 a cause for common failures -- common cause failures.  
23 I mean, that really should be the driver here,  
24 because --

25 DR. MURLEY: Yes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER APOSTOLAKIS:    -- it's the same  
2                   thing with the list of causes that Ashok put up there.  
3                   Yes, I mean, I can look at particular human action and  
4                   find the causes and say it was this and that, and that  
5                   -- but what really worries me is that if the next one  
6                   has the same cause, and the next one, I mean, it's  
7                   really the dependencies that are created by these  
8                   things that give them importance, not the fact that  
9                   you have individual lapses in judgment.

10                   And this is not really emphasized enough  
11                   in the documents that I have seen, not just the NEA,  
12                   but in general this aspect of potential common cause  
13                   failures.    What is your view on that?    Or is it  
14                   implied by what you are saying?

15                   DR. MURLEY:  It is partly implied, George,  
16                   but I don't think enough careful thought has been  
17                   given to the particular vulnerabilities to common mode  
18                   failure that -- to my mind, a poor safety culture is  
19                   the granddaddy of all common mode problems in a plant,  
20                   because it cuts across -- I mean, just go back and  
21                   look at what happened at Chernobyl.

22                   I thought it was very insightful for INSAG  
23                   to use the term "safety culture," but it -- because  
24                   that's the thing that caused people to run the test in  
25                   the first place, to keep running the test or planning

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the test when they shouldn't have, to shut off ECC  
2 systems. What is the common theme to that? And it  
3 was the attitude of the people at the plant that  
4 allowed them to do that, which was safety culture.

5 But other than that, I don't know that a  
6 lot of regulatory inspection thought has been given to  
7 focusing particularly on common mode --

8 MEMBER APOSTOLAKIS: Ashok, you want to  
9 comment on this?

10 MR. THADANI: Just a brief comment. I  
11 think I completely agree with the point you're making.  
12 In the end, that's really what you ought to be  
13 concerned about. What we were trying to search for,  
14 and if we get back into this area -- and I'm speaking  
15 for Research now -- was can we -- valve misalignments,  
16 or whatever. Pick some examples.

17 Can we point to the causes? Are they  
18 coming from improper maintenance of components, if you  
19 will? Can you integrate the information that you are  
20 looking at and move it up to say, "Well, perhaps the  
21 issue is maintenance training."

22 MEMBER APOSTOLAKIS: That's right.

23 MR. THADANI: And that's what you're after  
24 in the end. It's not the individual problem. It's  
25 the collective impact of those problems on what could

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 go wrong down the road.

2 MEMBER APOSTOLAKIS: Yes.

3 MR. THADANI: And that's really -- and I  
4 personally think that we have -- "we," again Research  
5 -- has not done a very good job of articulating how  
6 some objective information could be collected,  
7 analyzed, and translated into what could really be  
8 important in terms of safety. You can apply that same  
9 thing to training of operators, if you go to root  
10 causes and move up and integrate that information.  
11 And that's really the area that at one point we were  
12 interested in pursuing.

13 MEMBER APOSTOLAKIS: And my point -- I  
14 know that you guys believe that, but my point was that  
15 in the literature on safety culture, this is not  
16 emphasized enough, that you are not really looking for  
17 an individual error. You are really trying to see  
18 whether there is a systematic problem.

19 MR. THADANI: Yes.

20 MEMBER APOSTOLAKIS: Which, of course, is  
21 consistent with what Mr. Dugger told us about senior  
22 management, and so on, because they set the tone.

23 Okay, Tom.

24 DR. MURLEY: I will close, Mr. Chairman,  
25 with just these thoughts, then. It's very difficult

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 -- and, in fact, the conclusion of the CNRA, when they  
2 -- when we wrote this report and when they approved  
3 it, was that you can -- a regulator cannot regulate  
4 safety culture as an entity like that. But that  
5 doesn't mean that regulators are helpless.

6 MEMBER APOSTOLAKIS: Right.

7 DR. MURLEY: There are many things they  
8 can do, and these are some -- what was proposed was a  
9 graduated approach. You do -- where you start to get  
10 inspection signs, resident inspectors telling you  
11 things. You do special surveillances. You meet with  
12 plant management.

13 And here, Dana, you can go beyond the  
14 regulations. Regional management frequently -- I  
15 think probably always is not inhibited in saying,  
16 "You've got a problem in your radiological control  
17 program. Do you know that?" And those things happen  
18 all the time, you know, and --

19 MEMBER POWERS: Yes, sure they do.

20 DR. MURLEY: You meet with top corporate  
21 management, sometimes meet with the Board of  
22 Directors, and sometimes have to take enforcement  
23 action. So there are things that can be done, not  
24 enough time to go into all of those, but I think I've  
25 given a flavor --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER APOSTOLAKIS: No, that's fine.  
2 That's fine.

3 Okay. Any questions for Tom? And we'll  
4 come back to these issues, I'm sure, at the end of the  
5 panel.

6 Okay, great. Thank you very much. I will  
7 thank the first three speakers.

8 We'll take a break now until 10:30.

9 (Whereupon, the proceedings in the  
10 foregoing matter went off the record at  
11 10:14 a.m. and went back on the record at  
12 10:32 a.m.)

13 MEMBER APOSTOLAKIS: Back into session.

14 The next speaker is Mr. Howard Whitcomb?

15 MR. WHITCOMB: Yes.

16 MEMBER APOSTOLAKIS: Please say a few  
17 words about why you're here, and then proceed.

18 MR. WHITCOMB: Mr. Chairman, and members  
19 of the committee, thank you for the opportunity to  
20 share my comments on the understanding of safety  
21 culture. I'm a resident of Ottawa County, Ohio, the  
22 county of residence of the Davis-Besse facility.

23 I suspect I'm here today because of my  
24 interest in the matters of safety culture. I've asked  
25 Mr. William Keisler of the Nuclear Maintenance

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 Integration Consultants Corporation to share his  
2 experiences with the committee this morning. We offer  
3 this information in hopes that you find it helpful in  
4 framing anything that's necessary towards the future.

5 Before I suggest the characteristics of an  
6 appropriate safety culture, I would like to take a  
7 step back and look at where the industry has been.  
8 The concept that an appropriate safety culture is a  
9 necessary ingredient for the safe operation of a  
10 nuclear facility is not new.

11 Safety culture and its contribution  
12 towards the effective material condition management of  
13 a nuclear plant has been known for over two decades.  
14 It has its origins all the way back to Three Mile  
15 Island. The discovery of the seriously corroded  
16 reactor vessel head at Davis-Besse in February of 2002  
17 is the most recent reminder of the safety and economic  
18 consequence resulting from a lack of genuine  
19 commitment to the safe operation of a nuclear reactor.

20 In this case, the irreparable damage to  
21 the reactor vessel head was the result of a deliberate  
22 refusal to perform routine inspection and maintenance  
23 on a critical reactor pressure vessel component. This  
24 is not the first time that the failure to perform  
25 requisite maintenance on plant equipment has occurred

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 at the Davis-Besse nuclear plant.

2 The types of problems recently identified  
3 in determining the root cause at the Davis-Besse  
4 nuclear plant result from a lack of technical  
5 competence and management integrity. A degraded  
6 reactor vessel head is only a symptom of the problem.

7 Subsequent to the loss of the main and  
8 auxiliary feedwater event at the Davis-Besse plant in  
9 1985, the Nuclear Regulatory Commission promulgated  
10 its findings and conclusions as to why the event  
11 occurred in NUREG-1154.

12 Specifically, the NRC's investigation  
13 concluded that the underlying causes of the event  
14 were, one, a lack of attention to detail in the care  
15 of plant equipment.

16 Two, a history of performing  
17 troubleshooting maintenance and testing of equipment  
18 and of evaluating operating experience relating to  
19 equipment in a superficial manner. And as a result,  
20 the root causes of the problem were not always found  
21 and corrected.

22 Three, the engineering design and analysis  
23 effort to address equipment problems was frequently  
24 either not utilized or was not effective. And,  
25 finally, the equipment problems were not aggressively

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 addressed and resolved.

2 With respect to specific characteristics  
3 of an appropriate safety culture, I offer the  
4 following. Number one, an appropriate safety culture  
5 mandates the existence of a proactive maintenance  
6 regimen for all plant equipment, regardless of its  
7 safety classification.

8 Two, an appropriate safety culture exists  
9 when employees are confident that their concerns  
10 affecting the material condition of the plant  
11 equipment will be expeditiously addressed and  
12 resolved.

13 Three, an appropriate safety culture  
14 exists when employees who raise legitimate equipment  
15 concerns receive positive recognition for raising  
16 those concerns.

17 Four, an appropriate safety culture exists  
18 when equipment issues are timely reviewed by all  
19 facets of plant management.

20 Lastly, an appropriate safety culture  
21 exists when plant economics does not indiscriminately  
22 interfere with a decision to perform immediate  
23 corrective action.

24 With respect to why some nuclear  
25 facilities perform better than others, Commissioner

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Zech of the NRC, in the March-April 1988 issue of  
2 Nuclear Industry, stated that, "If there is one key,  
3 it is what I call leadership involvement -- leadership  
4 involvement, with an emphasis on and real  
5 understanding of quality."

6 How far down the organization does the  
7 chief executive officer look to find out why his plant  
8 isn't operating as well as it should? Through the  
9 operators, to the maintenance people, to the  
10 technicians, communications is so important.  
11 Standardization is important, if the industry is going  
12 to survive in our country.

13 I submit to you, gentlemen, that the  
14 necessary ingredients to achieve a desirable safety  
15 culture include management leadership, personal  
16 integrity, technical competence, personal reliability,  
17 and two-way communications.

18 Mr. Keisler will provide more detail as to  
19 the attributes that are necessary.

20 Thank you.

21 MR. KEISLER: Culture is not a soft issue  
22 in reactor and public safety. It is the most dominant  
23 factor. Just as radiological material decays to a  
24 lower energy, the same is true of organization  
25 personnel behaviors.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           Organization half-life is a characteristic  
2           that becomes visible when it is ignored. Organization  
3           half-life must be proactively managed to prevent  
4           material condition degradation if actual reactor and  
5           public safety are to be achieved.

6           The management of organization half-life  
7           was first advanced by Mr. Ollie Bradham at the V.C.  
8           Summer Nuclear Plant. Davis-Besse illustrates and  
9           confirms that organization half-life is the  
10          disintegration factor in reactor and public safety  
11          that is presently unmonitored.

12          The lack of safety culture at a nuclear  
13          plant does not mean there is no culture. At Davis-  
14          Besse, that culture is one of systemic refusal to  
15          perform requisite maintenance. Retrospective from  
16          today, the Davis-Besse culture has sustained through  
17          three management regimes. Approximately every eight  
18          years since commencing commercial operations, the  
19          Davis-Besse nuclear powerplant has yielded an  
20          unacceptable equipment challenge to the nuclear  
21          plant's established margin of safety.

22          The common denominator in each of these  
23          eight-year half-life periods is the recurring failure  
24          of regulatory oversight to recognize the degrading  
25          culture prior to the equipment challenge of the margin

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 of safety. That regulatory failure is not by  
2 complacency, nor laxity, nor nuance.

3 Davis-Besse has a distinctive organization  
4 half-life regarding reactor and public safety that  
5 must not be ignored. As the nuclear industry postured  
6 towards risk-based management, the culture at Davis-  
7 Besse was inappropriately not factored. The culture  
8 at Davis-Besse, embracing superficial analysis and  
9 inspection as well as the systematic refusal to  
10 perform maintenance, has always been incompatible with  
11 the risk-based management strategies.

12 The hole in the reactor vessel head, or  
13 something similar to it, was inevitable, and the  
14 occurrence was anticipated, if not even predicted, as  
15 early as 1988. Since 1988, the nuclear industry has  
16 deviated from its ethical foundations.

17 Risk-based management is sound science; I  
18 support it. But risk-based management requires a much  
19 higher degree of organizational self-discipline than  
20 other more prescriptive strategies. The science of  
21 risk-based management has truly been misapplied in  
22 some applications. Risk-based management can stratify  
23 maintenance priorities. However, risk-based  
24 management cannot eliminate maintenance.

25 This fallacy is being articulated from the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 highest levels of the nuclear industry. This is not  
2 so nuanced in the perceptions. The articulations are  
3 contrary to nuclear industry experience.

4 The pinnacle events in the nuclear  
5 industry over the years show interactive failure  
6 between safety-related and non-safety related  
7 equipment. Nothing in a nuclear plant should be  
8 allowed to run to failure, not enough lightbulbs. The  
9 hole in the reactor vessel head at Davis-Besse is an  
10 indicator. It is not simply a statistical outlier.

11 The premise of operating some equipment by  
12 a run-to-failure premise is unacceptable in lieu of  
13 proactive maintenance where there is a lack of safety  
14 culture, or the culture is those refusals. The run-  
15 to-failure mentality affects the managing organization  
16 and impacts safety-related and quality-related  
17 structure system and components.

18 Erosion and corrosion are known to be  
19 functions of how a nuclear plant is managed. Just as  
20 the Davis-Besse reactor vessel head is being  
21 destructively examined for the industry, the same  
22 level of examination needs to be performed regarding  
23 the historical culture of this licensee.

24 NuMIC's determinations are  
25 counterintuitive as to how risk-based management

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 strategies have been implemented to date. Material  
2 condition control -- when that becomes the focus as a  
3 byproduct of organization culture management, more so  
4 than simply systematic maintenance

5 While human emotion cannot will a pressure  
6 vessel's integrity to retain pressure, the fact is  
7 human emotion dictates human action. Degradation is  
8 a continual, time-related process that challenges  
9 material condition.

10 Degradation always demands that humans  
11 perform some actions upon the systems, structures, and  
12 components in a timely manner, at a nuclear plant that  
13 time constants and material condition degradation are  
14 generally longer than inherent organization half-life,  
15 creating an impact.

16 The attributes data of safety culture are  
17 identifiable and quantifiable. That's premised on the  
18 basis that human performance being the dominant  
19 influence upon the material conditions of the plant,  
20 then there become cause and effect scenarios between  
21 human behaviors and structures, systems, and  
22 components.

23 There was a good deal of work done  
24 privately in the late '80s with senior nuclear  
25 executives at some of the top-performing plants in

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 this country. And at that time I was a senior  
2 consultant at the Davis-Besse facility. Also, I spent  
3 20 years in ASME Section 11 activities, in repairs and  
4 replacements, pressure testing, welding.

5 In fact, I was the initial chairman of  
6 ASME 11's working group on replacements. So I have  
7 been somewhat involved in the regulatory process over  
8 the years, and even the culture changes that occurred  
9 within those code-making bodies.

10 From our work, number one, nuclear safety  
11 culture is an integration of moral and technical  
12 requisites. Leadership actions promulgate the ethical  
13 standards into technical confidence and organization  
14 etiquette.

15 Leadership philosophy and its beliefs --  
16 and its beliefs are purely on how it acts, not what it  
17 says -- are the determinant of the resulting  
18 organization's culture. It is the personal integrity  
19 of executives in leadership that governs a nuclear  
20 plant's material condition over the long license life  
21 of the plant.

22 Executive actions demonstrate their core  
23 values, and they must communicate from the highest  
24 level. And it is people who drive programs and not  
25 that programs drive people. Leadership actions more

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 so than statements signal the convictions that earned  
2 the management's respect.

3 The overall margin of safety is a  
4 combination of personnel integrity and equipment  
5 material condition management. Personnel integrity  
6 influences the material condition. Material condition  
7 must never influence in personnel integrity.

8 In an effective nuclear safety culture,  
9 personnel reliability profile standards are prevalent  
10 throughout the licensee at all organizational tiers.

11 MEMBER LEITCH: Could you slide your  
12 viewgraph up just a little bit, please?

13 MR. KEISLER: I'm sorry. Is that better?

14 MEMBER LEITCH: Yes, that's great. Thank  
15 you.

16 MR. KEISLER: Okay. I'm ready to change  
17 that one anyway.

18 MEMBER SHACK: Put it all the way up, as  
19 far up as you can. Good.

20 MR. KEISLER: Does that work? One thing  
21 that's key is that the organization recognizes that  
22 degradation of the material condition is a function of  
23 wear, aging, and culture. This degradation trend over  
24 the long license life, it does introduce a continuous  
25 dynamic into information management, equipment

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 management, and productivity management that is  
2 constantly changing throughout the life of the plant.

3 Proactive material control is a strategic  
4 byproduct of four concurrent managements --  
5 information management, which I think a lot of us can  
6 relate to back in configuration control through the  
7 design bases -- equipment management, organization  
8 management, and productivity management -- all of that  
9 integrated.

10 Organization management is the dominant in  
11 the integration of these other three managements. The  
12 reason for that, and we've heard it stated --  
13 obviously, I think there is some convergence of  
14 thoughts here, just even as we progress from what this  
15 simple graphic is showing.

16 Operations, maintenance, and engineering  
17 are enterprise-wide, interrelated functions, and not  
18 managed departments. Each function is a subculture in  
19 itself that requires obvious and continual executive  
20 leadership of personnel and administration  
21 integrations.

22 Organizational feedback from the lowest  
23 levels to the executive level is requisite, and it  
24 must be continuously sold and acted upon by senior  
25 leadership through formal programmatic efforts.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Leadership recognizes that organizational  
2 communications from the bottom to the top is the  
3 foundation of material condition management.

4 Data in and of itself is not information.  
5 The feedback from maintenance personnel -- and that is  
6 maintenance with a capital M, not just in the craft  
7 personnel -- throughout the licensee organization is  
8 the most critical feedback in material condition  
9 management.

10 Programmatic architectures and procedures  
11 for systematic maintenance alone do not inherently  
12 deliver effective material condition management over  
13 the long term.

14 What should the ACRS recommend to the  
15 Commission? The linkage of organizational culture  
16 indicators to the plant material condition indicators  
17 is necessary to assure the continued reactor and  
18 public safety.

19 The linkage should be codified in law  
20 similarly to the regulation of the maintenance rule.  
21 It has already been demonstrated that not all  
22 licensees can perform meaningful self-assessment with  
23 appropriate resolution.

24 The ACRS is the only entity with vested  
25 interfaces to the Nuclear Regulatory Commission, the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Department of Energy, the Department of Defense, and  
2 the Defense Nuclear Facilities Safety Board. The ACRS  
3 is the only body that is currently empowered to lead  
4 an industry advance towards the establishment of a  
5 meaningful nuclear safety culture within both the  
6 industry and the regulatory agencies with  
7 responsibility for the protection of the public.

8 It seems that two efforts appear  
9 requisite. The ACRS should demand the research,  
10 development, and codification of standards which marry  
11 organization culture relative to nuclear plant  
12 material condition. Nuclear safety culture that  
13 delivers an actual margin of safety requires a more  
14 advanced integration of the behavioral sciences with  
15 engineering and physics than currently exists today.

16 There is evidence suggesting that the  
17 demise of the nuclear industry from its early ethical  
18 foundations is at a level of deterioration that could  
19 become alarming.

20 The ACRS, secondly, should demand that a  
21 nuclear industry code of ethics be created and  
22 formally promulgated through training of all nuclear  
23 plant personnel throughout the nation in an effort to  
24 begin elevating personnel integrity and reliability to  
25 a common standard.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           The nuclear industry has drifted into an  
2           era where the most critical aspects to nuclear safety  
3           from organizational feedback regarding the material  
4           condition management are routinely forwarded as anti-  
5           company, anti-industry, and whistle-blowing.

6           This mentality has permeated the ranks of  
7           some licensees and the regulators alike to the point  
8           where reactor and public safety are now being  
9           seriously challenged.

10          In conclusion, I mention in the research  
11          that I had done I had worked -- some people I had  
12          mentored under early that brought the first plants in  
13          this nation to the top of the world in performance.  
14          That did not just happen. There were culture changes  
15          that happened then. I started my career with Duke  
16          Power Company at Oconee Nuclear Station.

17          The leaders in the nuclear industry of  
18          just one generation removed understood one thing  
19          profoundly. No one can make a nuclear plant perform  
20          by rhetorical superlatives. Those who set the  
21          industry standards understood that excellence is the  
22          personification of ideals. Excellence was a single  
23          word -- integrity.

24          The hole in the reactor vessel head at  
25          Davis-Besse has illustrated that no amount of science

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 or financial resources can offset those original  
2 understandings that had originally garnered the  
3 public's trust.

4 The challenge now before the Advisory  
5 Committee on Reactor Safeguards is truly of national  
6 and international dimension. It is not unprecedented.  
7 The culture change that occurred at the Oconee Nuclear  
8 Station between 1974 and 1984 delivered Duke Power  
9 Company from the brink of financial default to  
10 becoming the first American nuclear plant at the top  
11 of the world in performance. Was I witness to that  
12 change?

13 Duke Power's success was achieved from its  
14 leadership and organization-advancing technology to  
15 address reality. It was not the application of  
16 technology to offset leadership. The number one  
17 candidate of the ASME International's code of ethics  
18 in its nuclear cogent standards policies and  
19 procedures clearly states, "Engineers shall hold  
20 paramount the public safety, health, and welfare."

21 The license of a nuclear plant is a  
22 contract with the public. The license was issued upon  
23 a premise that the licensee continually assure the  
24 public that the material condition of structures,  
25 systems, and components conform with the design from

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 its fit and function.

2 Nuclear plants are not cars, nor trains,  
3 nor planes. But decades-old comparisons for  
4 justifying nuclear safety are of technological naivete  
5 now that we have experienced a throughwall breach of  
6 a reactor vessel head's pressure boundary.

7 The staggering energy that is contained in  
8 a nuclear plant core must never be underestimated.  
9 That is the most pro-nuclear industry statement that  
10 can be made in light of the past realities.

11 The ASME code of ethics states that it is  
12 the engineers -- people, not the science -- that shall  
13 hold paramount the public's safety, health, and  
14 welfare. Culture is reactor and public safety.  
15 Culture is shaped exclusively by the integrity of  
16 executive leadership. Excellence must be personified.

17 A senior executive at the Davis-Besse  
18 plant once made the following question regarding the  
19 Davis-Besse plant. He said, "If my superior tells me  
20 that the wall is brown, why should I ask the cleaning  
21 lady what color it is?" Sitting here today, that  
22 answer is so simple -- and it was then -- you must ask  
23 her, because she knows what color the wall is. If you  
24 do not ask her, executives can end up with a hole in  
25 the head, and that's not a metaphor and it never was

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 then.

2 Thank you for the opportunity to appear  
3 today.

4 MEMBER APOSTOLAKIS: Thank you very much.  
5 Any questions for these gentlemen?

6 MEMBER POWERS: I guess there is a  
7 question maybe just to explain a little bit on your  
8 philosophical approach here. Earlier in your talk you  
9 said, "Gee, we shouldn't run anything to failure," not  
10 -- shouldn't run anything, any equipment to failure,  
11 not even lightbulbs.

12 MR. KEISLER: Right.

13 MEMBER POWERS: I think that quotes you.  
14 Which I interpreted as saying there's no gradation in  
15 your approach here.

16 MR. KEISLER: No. I said that risk-based  
17 management can stratify maintenance.

18 MEMBER POWERS: Okay. So --

19 MR. KEISLER: There can be a hierarchial  
20 tier to it.

21 MEMBER POWERS: So there can be a  
22 degradation.

23 MR. KEISLER: Right. But what I think  
24 we've drifted into, sir, is that the run-to-failure  
25 mentality, because we're -- it's obvious in -- now we

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 know we've had sublicense life of steam generators  
2 that ruin your curve and bring it to 10 years out, or  
3 20 years.

4 MEMBER POWERS: Okay.

5 MR. KEISLER: That's an obvious component.

6 MEMBER POWERS: Okay. I was just --

7 MR. KEISLER: You've got 15,000 valves in  
8 a plant.

9 MEMBER POWERS: You have to have some sort  
10 of --

11 MR. KEISLER: Safety-related numbers and  
12 all of these other things --

13 MEMBER POWERS: You have to have some sort  
14 of degradation.

15 MR. KEISLER: Right. That same  
16 degradation trend, though, we've now seen it with a  
17 license life of the reactor vessel head going from  
18 hundreds of years to less than 25 years, into a  
19 function of how you do business.

20 So when you introduce this other thing, it  
21 affects the entire mentality. And you end up with  
22 10,000 backlog valves you hadn't gone to do any  
23 leaking on, because it doesn't directly in the PRA  
24 show up. Nevertheless, the corrosion that's coming  
25 from all of that is going to take you over the edge of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the cliff. Does that make any sense, what I was  
2 trying to illustrate?

3 MEMBER POWERS: Yes. I think I --

4 MR. KEISLER: Because I tried to do with  
5 the curved trend that, theoretically, when you put all  
6 of the hundreds of thousands of pieces together,  
7 there's a single point -- overall material condition.  
8 That's that that approximated, and all of these other  
9 things come into play.

10 But I do believe that risk-based  
11 management, and particularly in how you do your  
12 preventive maintenance program -- to get the biggest  
13 bang for the buck, we stay in front of it. Those  
14 correlations have to be.

15 But the one point back that it -- it's  
16 what I understood always, and close involvement at  
17 that time, almost led to where this body did recommend  
18 the maintenance rule, because we talk about tech specs  
19 and surveillance tests that are all legislative. In  
20 early years, we had people doing no PMs, and some  
21 people doing too much PM. We went to reliability-  
22 centered maintenance, and a number of other things.

23 But it came to a point of emotional  
24 constrictions where it's not regulated, and that's the  
25 organizational discipline you have to perform.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER POWERS:    Another area that you  
2 brought up that I struggled with is you pointed out  
3 that -- you had a little triangular diagram, and it  
4 had the engineering maintenance operations.  That  
5 diagram is not so pertinent here as the concept.

6                   Each of those areas has a culture, a  
7 subculture.

8                   MR. KEISLER:    Sure.

9                   MEMBER POWERS:  Within an overall culture.  
10 And when I look at safety culture by going in and  
11 examining each one of those elements, I will find a  
12 different safety culture in each one of those.  How do  
13 I arrive at an overall safety culture from those  
14 component parts?

15                  MR. KEISLER:    In that case --

16                  MEMBER POWERS:  I can think of a lot of  
17 addition -- I can take the average.  I could take the  
18 worst, you know, whichever had the worst safety  
19 culture by whatever measure I had for safety culture.  
20 And so that's the safety culture I'll ascribe to the  
21 plant.

22                  Is there some other additional mechanism  
23 that I should be using here?

24                  MR. KEISLER:    Well, there was another  
25 point I was trying to make.  First of all, the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 function is enterprise-wide. It moves through all of  
2 these. But the only thing, you can look at the first  
3 bullet under that in -- back in the text.

4           These interfaces require continuous  
5 leadership involvement by executive management. That  
6 would be what we'll be hearing characterized all day  
7 is their visibility and their interaction. That's a  
8 management responsibility to control. And so that you  
9 don't have that deviation -- even within the distinct  
10 cultures they have different roles that they play.  
11 But if you're seeing that as what you start to sense  
12 as a culture, it indicates there's a leadership  
13 question.

14           MEMBER POWERS: I always will, though. I  
15 mean, only in the ideal will you be able to have  
16 uniformity, even across those interfaces. So that if  
17 I have -- if I were to have some measure of safety  
18 culture, and I would apply that to each of those three  
19 elements, I'd get some differences.

20           This is a really good tool. I don't know  
21 what it is, but I've got a really good tool for  
22 measuring safety culture. I'll get some difference.  
23 How do I get from those examinations of the  
24 subelements of a facility a measure of the safety  
25 culture for the overall plant?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. KEISLER: I think it's like some of  
2 the earlier commentary was, that there is a number of  
3 things that start showing up because to do an outage  
4 well, refueling outages, forced outages, or whatever,  
5 it takes all of those departments and everybody  
6 working together.

7 So there are other things that start  
8 showing up early on and keep cascading the other way.  
9 If it's not truly there, in a way it will continue to  
10 deteriorate. But it will manifest in what we could  
11 look at -- outage durations, inability to keep  
12 schedules, just it will show up in aggregate in some  
13 ways that would be symptomatic of I think the  
14 condition that you're describing, as I understand it.

15 MEMBER APOSTOLAKIS: Any other questions?  
16 I mean, you also emphasize the leadership -- the  
17 importance of leadership, which I believe the other  
18 speakers did, too. But that brings me back to my  
19 pattern, my question that I raised earlier.

20 What can a regulatory agency do about the  
21 leadership? I mean, we're not supposed to run these  
22 plants. But that creates a problem for me because,  
23 again, as you correctly pointed out and other speakers  
24 did, this agency is charged by the American people  
25 with protecting the health and safety of the public.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Period.

2 It doesn't say, you know, but don't get  
3 involved in senior management issues, and so on. It  
4 says, just protect the health and safety of the  
5 public.

6 MR. KEISLER: That's ultimately what it's  
7 all about.

8 MEMBER APOSTOLAKIS: Right. And it seems  
9 to me that we are all agreeing here that leadership of  
10 the plants is extremely important. And yet we are  
11 very reluctant to get into that. And do you have any  
12 thoughts on that? I mean --

13 MR. KEISLER: Well, I made --

14 MEMBER APOSTOLAKIS: -- what do you see  
15 the agency doing?

16 MR. KEISLER: I made a statement in there  
17 that in the organization half-lives, and I am  
18 intimately familiar with the history of this plant --

19 THE WITNESS: Right.

20 MR. KEISLER: -- you will go look -- and  
21 I think there's more work to be done, but there was a  
22 common theme in each of the half-lives, and that was  
23 a regulatory failure to act, even in the aftermath of  
24 obvious events, things that occurred that should not  
25 have occurred.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           There's a mentality being conditioned by  
2           that. Those requisites were already there. I think  
3           that the labyrinth to protect the public health and  
4           safety does exist. What's so perplexing now is this  
5           failure didn't happen overnight, and all of the  
6           signals were ignored. So I --

7           MEMBER APOSTOLAKIS: Do you know why?  
8           Does anyone know why?

9           MR. KEISLER: Those signals were there.

10          MEMBER APOSTOLAKIS: Okay.

11          MR. KEISLER: And those archives will  
12          reflect that even now. I think there is more work to  
13          be done, and in the vein, too, that it is that  
14          important to where we are as an industry, because  
15          there is now -- the entire spectrum has widened. A  
16          lot more plants are better, I would agree with that.

17                 But the single event that we're talking  
18          about on a nuclear plant can never be allowed to  
19          happen. It's not a matter of averages.

20          MEMBER APOSTOLAKIS: Right.

21          MR. KEISLER: There can be done. We came  
22          to the brink of now -- no airplane crash could ever  
23          approximate what might have been, to the point that  
24          none of us ever assumed that that could even be there.  
25          They didn't assume that people could ignore what got

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 ignored for that long.

2 So but also again, too, in my mind  
3 everything in a plant exists -- its design basis, and  
4 that other curve looked at distinct errors, and there  
5 was one reason for that. Design and construction  
6 startup, HFT, this could verify that we build it to  
7 what we designed it to. We can operate it within the  
8 bounds.

9 So there is some maximum level there from  
10 the design bases of an overall physical condition, and  
11 that's where we start, and say we do have enough  
12 history now to know that there is a slow physical  
13 decline in aggregate over time. That's what throws  
14 the challenge continually to organization.

15 In particular, aging it forces a different  
16 diagnostic technique. It's not just like change the  
17 oil filters, do this. We get into passive  
18 degradations, the NDE technologies that go -- not  
19 every -- I mean, this area is a specialization, and  
20 you have to build an organization proactively to have  
21 that capability to stay in front of it, because it's  
22 constantly deteriorating and coming at you.

23 And once you get behind it -- I had a  
24 farmer once tell me, he said, "It seems like you lose  
25 money on a property. If it's down a dollar, you need

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 two dollars to get back even." He said, "I don't know  
2 why it is, but it takes three."

3 Well, you are behind, and you've got to  
4 get up front and get your profit money back, too. And  
5 once you're behind that curve, it accelerates faster.  
6 And I think we've all been disturbed with  
7 erosion/corrosion as to how fast it can affect the  
8 total plan. You know, and that trend is coming at us  
9 at a 25-year interval rather than what we would have  
10 thought maybe in 30 to 40 years on a plant, and we've  
11 also gone into life extension now. We're already in  
12 six-year intervals here.

13 But I still see it that -- and what the  
14 researchers, the people who had led those plants, and  
15 we sat down many, many hours trying to figure out why  
16 it worked. These other things came out, and the thing  
17 was you've got to manage the organization with an  
18 intense effort. This isn't a part-time effort. It  
19 probably takes 80 percent of your efforts to deliver  
20 that byproduct.

21 And if you just function on maintenance  
22 procedures and other things, you will build that wall,  
23 but it will be so straight and so tall that it will  
24 collapse in the wind. It won't have the integrity  
25 that you need to hold that place solid.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   That's how I see it. I don't know whether  
2 I'm explaining it --

3                   CHAIRMAN BONACA: The question I have is  
4 the issue of leadership was recognized from the time  
5 of TMI. I mean, that has really led to the formation  
6 of INPO. Do you see a role for an industry  
7 organization such as INPO or NEI, I mean, to -- you  
8 know, in this sense? I mean, where the regulator  
9 cannot interfere in the running of a plant? The  
10 industry has organizations that, in fact, do monitor  
11 leadership and --

12                  MR. KEISLER: Well, I don't think that --  
13 I'm not sure I'm buying completely that you can't do  
14 that. I think that's part of the culture drift that  
15 is occurring now and that we're hearing, because in  
16 the obvious cases that are really in the outliers,  
17 like a hole in a reactor vessel.

18                  And we had an indication -- we had the  
19 same problem happen at Turkey Point way back. That's  
20 what largely influenced Generic Letter 88-05. There  
21 was special -- and what you're seeing now in the  
22 industry, ASME Section 11, we were all required to  
23 attend special sessions of those meetings to look at  
24 the physical films of that reactor vessel head.

25                  This is not something new. It got

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 ignored. That was in, what, '86 or '87. I mean, I  
2 sat through those presentations, and what was clear  
3 then, because Turkey Point's reliability had  
4 increased, and all of a sudden they got into  
5 continuous runs that were unprecedented. And I think  
6 it was a canopy seal leak that caused that drip, and  
7 in that 200- or 300-day run there was a crevice from  
8 the top of the vessel that nobody would have ever  
9 thought before could have gotten there that fast that  
10 deep.

11 There was a problem on a reactor coolant  
12 pump motor stand mount at Rancho Seco that -- with the  
13 main closure gaskets leaking, literally eroded four to  
14 six inches back up into the motor stand that was  
15 invisible. You almost had a structural integrity of  
16 the motor to the pump.

17 MEMBER APOSTOLAKIS: I think we should  
18 move on.

19 MR. KEISLER: Okay.

20 MEMBER APOSTOLAKIS: And then if we have,  
21 as I said, some time at the end of the presentations,  
22 to revisit some of these issues.

23 Thank you, gentlemen.

24 MR. KEISLER: Thank you.

25 MEMBER APOSTOLAKIS: The next speaker is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Mr. Alan Price. David Collins, sorry. Now, that was  
2 not a systematic error, you understand.

3 (Laughter.)

4 MEMBER SHACK: What do you call that, a  
5 slip or a lapse?

6 MEMBER APOSTOLAKIS: It was a lapse.

7 So tell us a few words about yourself, and  
8 then proceed with your presentation.

9 MR. COLLINS: Okay. Good morning, members  
10 of the ACRS and guests.

11 MEMBER APOSTOLAKIS: Speak into the  
12 microphone, please.

13 MR. COLLINS: How is that? Can everybody  
14 hear me now?

15 MEMBER APOSTOLAKIS: This is good.

16 MR. COLLINS: Is that good? I work at  
17 Millstone, which a few years ago was auctioned by  
18 Northeast Utilities and bought by Dominion. The views  
19 I express here are my own, and may or may not be  
20 shared by Millstone or Dominion.

21 In the early '80s, Northeast Utilities was  
22 considered one of the top nuclear operators in the  
23 U.S. By the mid '90s, it was viewed as one of the  
24 worst. Like many operators, NU began to aggressively  
25 manage costs in reaction to deregulation, preparing

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 for competition. NU did a good job with costs, but  
2 not as good a job with culture. This presentation  
3 will discuss some reasons why and suggest some tools  
4 for measuring and managing culture.

5 Now, if George thought that Tom Murley had  
6 too many slides -- I will be moving fairly briskly,  
7 not sharing quite a bit as I go along. And at the end  
8 we can go back and review any particular slides people  
9 would like in detail.

10 How about if I -- Slide Operator?

11 MEMBER APOSTOLAKIS: It's over here.

12 MR. COLLINS: Oh.

13 MEMBER APOSTOLAKIS: You're already up  
14 there.

15 MR. COLLINS: Okay. How about if I just  
16 raise my hand for the next slide? Okay.

17 Okay. So why is it important to manage  
18 culture? INPO analysis of events says that 70 percent  
19 of the most significant ones are related to culture.

20 Now, how does one go about managing  
21 culture? To manage something you have to be able to  
22 measure it, and to measure something you have to be  
23 able to define it.

24 Former Chairman Richard Meserve said at an  
25 INPO CO conference last year that the term "safety

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 culture" hasn't been crisply defined, and that's  
2 really the reason the NRC has trouble measuring it.  
3 So what I'm going to talk about is defining,  
4 measuring, and managing culture, and along the way  
5 what creates it and what destroys it.

6 Now, defining safety culture starts with  
7 defining safety. Ethics is caring about people, and  
8 safety is caring that no physical harm comes to  
9 people. So safety is a type of ethical behavior.  
10 Next we need to define culture.

11 The simplest definition of culture is --  
12 this is from Edgar Schein -- the way we do things  
13 around here. Now, Schein is considered by many to be  
14 the gooiest guru of culture. He's an MIT professor.  
15 And one of the quotes from him is, "We could argue  
16 that the only thing of real importance that leaders do  
17 is to create a managed culture." And I think that  
18 that's been expressed here many times.

19 So leaders create culture. How exactly do  
20 leaders create culture? By a leadership attitude of  
21 ethical management. You can see that safety culture  
22 is part of the -- part of leadership culture and part  
23 of human performance culture and part of  
24 organizational culture. Leadership creates the  
25 culture in the other two, and flows from leadership to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the other two.

2 So putting all of this together, we come  
3 up with a new definition for safety culture, which is  
4 a leadership attitude that ensures a hazardous  
5 technology is managed ethically, so individuals in the  
6 environment are not harmed.

7 Dr. Jonathan Wert, President of Management  
8 Diagnostics, says there must be a champion for nuclear  
9 safety culture. The chief nuclear officer/president  
10 should be that champion. Leadership drives the  
11 culture. So what exactly are the tools? What are the  
12 attitudes that leadership uses to drive the culture?

13 The first one is trust, and during most of  
14 recovery that was the huge issue. That was basically  
15 expressed as the root cause, that the public and the  
16 regulator had lost trust that Millstone was operating  
17 safely. John Carroll of MIT did a wonderful paper  
18 which I just shipped over -- I hope we can find the  
19 stuff -- called Managing Change -- or Driving Change  
20 in the Midst of Crisis.

21 And Rickover had a word that he coined  
22 called "say-do," which is basically trust, doing what  
23 you say. And in Dominion reactor head replacements,  
24 I think I read an NRC transcript, they were pointed  
25 out as a good example of doing the right thing.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1           The next value is commitment to  
2 excellence. Again, we have Rickover with his rising  
3 standards of excellence. We have INPO's excellence in  
4 human performance. And Lee Olivier, when he was at  
5 Millstone, established a best of the best program.

6           The third and final one we have is care  
7 and concern. The motto of Hugh Kelleher, CEO of  
8 Southwest Airlines, one of the only airlines making  
9 money I think, is take care of the employees, and they  
10 will take care of the company. That was very much an  
11 attitude of Mr. Olivier. And Dominion's work-life  
12 balance -- Thomas Capps is very big on ethics. He has  
13 written about it. James O'Hanlon is another very  
14 impressive guy. I think he headed up the excellence  
15 in human performance task force for INPO. And Mr.  
16 Alan Price, to my right, I think is a good example of  
17 that.

18           So my key concept, third key concept, is  
19 that determinants of a safety culture are the  
20 leadership-demonstrated ethical attitudes of trust,  
21 commitment to excellence, and care. Really, all we're  
22 talking about is doing what's right, which is trust,  
23 doing your best, which is commitment to excellence,  
24 and treating people right. It's really pretty simple.

25           Now, the most important of these when you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 -- an organization needs to adapt to cost-cutting lean  
2 production is care and concern for all stakeholders  
3 and individuals, which is called an adaptive culture.  
4 An adaptive culture is one that maintains a proper  
5 safety focus as production becomes more and more lean,  
6 and this is out of this strategic management textbook.

7 It says the outstanding trait of an  
8 adaptive culture is that top leadership demonstrates  
9 genuine care and concern for the well being of all  
10 constituencies.

11 And the next slide is just basically a  
12 rehash of that.

13 So when we have a safety culture like --  
14 problem like Millstone had in the '90s, where the  
15 safety culture failed to adapt along with the cross-  
16 cutting, it's usually because of a lack of the care  
17 and concern.

18 So what is it that destroys safety  
19 culture? Here we have some words from -- John Beck  
20 was told by the NRC to monitor safety culture for a  
21 while after Millstone recovery. And he said in his  
22 last report, his final report to Millstone leadership,  
23 "Never forget that previous management failed so  
24 miserably not because they were not intelligent, not  
25 because they did not understand clearly what

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 successful economics look like in a competitive  
2 environment; they failed because they were arrogant,  
3 dismissive, and refused to listen to the issues and  
4 concerns of the people who make this place run."

5 And here are some of the messages that  
6 were rolled out by NU leadership in the early -- late  
7 '80s and early '90s from the NU CNO. We can no longer  
8 -- these are in the general meetings with employees.  
9 We can no longer afford to be a Cadillac. We must  
10 become more like a Chevy. If it is not absolutely  
11 necessary to do something, it is necessary to not do  
12 it. We have to do things differently now to be  
13 competitive. If you don't like it, there are 100  
14 people waiting outside the door to take your place.

15 An employee responded at the meeting,  
16 "What about company loyalty to employees?" and the CNO  
17 responded, "If you want loyalty, I suggest you get a  
18 dog."

19 MEMBER APOSTOLAKIS: Are these in writing  
20 somewhere?

21 MR. COLLINS: These are -- I can go and  
22 get you as many, you know, witnesses at Millstone as  
23 you want. This is right open in public meetings.

24 I actually went to a stockholders meeting  
25 and asked the NU Board of Trustees, "Where were you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 guys when all this stuff was going on?" because there  
2 were so many reports. And they said they never saw  
3 the 14 different reports on the pervasive, shoot-the-  
4 messenger attitude with any nuclear organization.

5 Now, the question is: is this a lack of  
6 care on the -- by the trustees, or is this a lack of  
7 culture metrics? And I would say that they weren't  
8 getting the information that they needed to make the  
9 calls.

10 I have a slide on the same stuff on Davis-  
11 Besse, but I'm really not here to discuss it. A lot  
12 of other people are going to discuss that, so I'll  
13 just move on and come back to it if people want.

14 Okay. Metrics -- how do you measure this  
15 stuff?

16 Leadership skills. The INPO SER in Davis-  
17 Besse says, "Assess that your organization has the  
18 leadership skills to maintain the proper focus on  
19 safety, and identify long-term, underexplained,  
20 abnormal conditions."

21 Now, Lou Holt says if you want to know if  
22 you have a good leader you just need to ask three  
23 questions. Can I trust you? Are you committed to  
24 excellence? Do you care about me?

25 And when I started thinking about culture,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 really, can I trust you just connected with the trust  
2 issue at Millstone, and I started thinking about the  
3 other ones and I said, "If leadership drives the  
4 culture, maybe these are the kind of litmus-type  
5 questions that we can assess the leadership culture."

6 So I went around at Millstone and I asked  
7 a bunch of employees these three questions about the  
8 chief nuclear officer that we had and about Lee  
9 Olivier, who was the officer we had at the time, which  
10 most people didn't know Lee felt he had an excellent  
11 culture. And without a single exception, the answers  
12 were all no for the first guy and all yes for the  
13 second guy. So I said maybe these are the questions  
14 in our litmus to see if the leadership has the skills  
15 to manage a -- properly manage a safety culture.

16 Now, back to this Venn diagram of the  
17 leadership skills. You'll see at the top that the  
18 leadership behaviors are really the determinants of  
19 the culture. That's what controls the culture. And  
20 the others -- the human performance attributes in the  
21 culture are the resultants of the culture.

22 This is John Sorenson commenting on this  
23 approach, looking at leadership. He says, "David, I  
24 think the idea of using" -- let me back up. Mr.  
25 Sorenson wrote this paper, which I consider to be

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 probably the most excellent paper on nuclear safety  
2 culture. I don't know how long he spent on it. He  
3 did it for the ACRS, and he looked at safety culture  
4 methods from all around the world. An incredible  
5 paper -- I suggest anybody read it to learn about  
6 culture.

7 But he said, "I think the idea of using  
8 leadership culture as a surrogate for safety culture  
9 is a good one." And then he goes on to say, "You've  
10 laid out a promising approach. I think it has a good  
11 chance of advancing the state of the art."

12 So back to this measuring the  
13 determinants. Now, if you look at the second block,  
14 body fitness, how do you measure your weight? You  
15 step on a scale. But this isn't really information  
16 you need to know to manage your weight. The  
17 information you need to know are the determinants of  
18 weight, which is diet and exercise. So you need to  
19 measure and control what you eat and how much you  
20 exercise, and the result will be that you'll control  
21 your weight.

22 I'm sorry. Back up to that slide for a  
23 second. So it's the same thing. Up here I have  
24 leadership behavior, attitudes, as a determinant, and  
25 I have the organization culture, latent organizational

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 weaknesses, and human performance culture. And this  
2 just sums up the same concepts. Skip that.

3 Now, where do you get this information on  
4 how the culture is doing, both leadership and LOWs?  
5 INPO fundamentals, HP fundamentals, say the worker is  
6 the best source of information about the weakness of  
7 the organization.

8 Back to John Carroll of MIT, who wrote  
9 that paper that I held up a while ago, he says,  
10 "Really, the most important thing is to  
11 institutionalize surveys and dialogues with workers."  
12 And, again, that's the key to effective safety culture  
13 management.

14 Now, what are some methods for measuring  
15 safety culture? Now, as far as actually what this is  
16 is the different organizations that we have. What is  
17 something that INPO could do to help measure safety  
18 culture? Well, they could develop approaches for  
19 institutionalizing worker feedback.

20 What I did at Millstone was I ran a sample  
21 survey, if I could find it here -- where did that go?  
22 Do you have some paper that's blue over there? Oh,  
23 there it is. It's a simple survey. It just asks the  
24 basic questions. Do you care about me? Are you  
25 committed to excellence? Can I trust you? And it

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 does it through the whole worker's food chain, and it  
2 basically gives a read to the leaders on his culture.

3 And it cross-references to lots of the  
4 different latent organizational weaknesses that we'd  
5 find in the culture. So, basically, it doesn't just  
6 say, do I like you or don't like your face, it says,  
7 what are the specific issues that I feel I don't --  
8 that the leader is weak on.

9 Now, methods for managing culture -- we  
10 have INPO here promoting human performance leadership  
11 and organizational training. I think they have  
12 something called the Academy, and they have some  
13 wonderful human performance literature on leadership  
14 and organization, which really every leader should  
15 read.

16 And the second one is promote training  
17 above the chief nuclear officer level. People like  
18 Peter Berg of FENOC -- I mean, I think he's a great  
19 CEO, but some of the things that he talked about as  
20 far as how he -- metrics he was using for culture, he  
21 was saying he was using -- how long was the plant  
22 online, what was the industrial safety metrics. I  
23 think he needs different metrics.

24 Now, the plant needs to improve leadership  
25 behavior through feedback -- somehow kind of feedback

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 by talking to workers, and that survey is a way to do  
2 it, improve the corrective action program when there's  
3 not enough resources for it and focus resources, and  
4 for the NRC they need to monitor all of these things.  
5 And also, they need to start using the reactor  
6 oversight process performance indicators to flag when  
7 there's culture problems.

8 Here's a quote from reactor oversight from  
9 an ACRS transcript from somebody who works in reactor  
10 oversight. Mr. Johnson said, "The problem was we  
11 predicted," or "we predicated," I should say, "about  
12 15 out of the last four of them. You know, we  
13 overpredict." So how do we assess risk without  
14 overpenalizing the plants?

15 I suggest that we could take a look at the  
16 type of information that was -- all the plants culled  
17 together from the response to the Davis-Besse SER, and  
18 here's a sample from the plant I worked at. There's  
19 about 70 items. Risk assess those, you could use the  
20 EPRI assessment tool, the action matrix, and make a  
21 weighted plot of the latent organizational weaknesses  
22 for risk on a normal distribution.

23 And then, the small tail on the right side  
24 of the distribution would be that the plants that have  
25 an unusual number of these risky weaknesses that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 haven't been addressed, and the other side of the  
2 equation would be plants that don't seem to be  
3 reporting them effectively.

4 So a key concept here is to create -- we  
5 need to create an objective risk-based management  
6 method, safety culture, and it requires developing a  
7 baseline, which requires analyzing latent  
8 organizational weakness data from U.S. plants.

9 That's a summary that you can read if you  
10 like. I'm just going to skip through it for now.

11 And conclusions is that plants need INPO  
12 and the NRC to do a better job with safety culture,  
13 and corrective action program assessments. My opinion  
14 is that Davis-Besse's safety culture is probably no  
15 worse than many other plants out there, and that  
16 everyone who manages nuclear should be trained in  
17 safety culture, both posturing and assessing it,  
18 especially above the CNO level.

19 This is a slide from the ACRS meeting  
20 transcript, and it's basically saying that, should we  
21 just keep doing the same things over and over with  
22 safety culture? And isn't that the definition of  
23 insanity?

24 So concluding remarks is safety culture is  
25 really a safety-related system, but it's a human

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 behavioral system, not an electromechanical one like  
2 we're used to. So we don't maintain it like a safety-  
3 related system, but we should.

4 This concludes my presentation. I'll be  
5 happy to try to answer any questions.

6 MEMBER APOSTOLAKIS: What did you mean by  
7 the second bullet in your conclusion that the Davis-  
8 Besse safety culture is probably no worse than many  
9 other plants out there. Is there a message there?

10 MR. COLLINS: Yes, there is definitely a  
11 message there. I'm saying that there's no objective  
12 way to assess whether the safety culture at Davis-  
13 Besse is necessarily the worst in the industry or  
14 necessarily represents risk unless we create a  
15 baseline on some kind of a distribution of risk.

16 I think Randy Fast of Davis-Besse said in  
17 one of the meetings that Davis-Besse has the best  
18 material condition of any of the FENOC plants, and the  
19 operators have one of the lowest error rates of any  
20 plant in the country. So there's a couple of  
21 indicators that don't -- that say that there may not  
22 be all that bad a safety culture at Davis-Besse. It  
23 may be a localized type thing.

24 But the NRC has been reporting -- now we  
25 have an event at Davis-Besse, and everyone says, well,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Davis-Besse has just the worst safety culture that  
2 there is. But the NRC has been reporting that the  
3 safety culture is acceptable, and the corrective  
4 action program is acceptable.

5 So with those kind of indicators, to  
6 someone like Peter Berg at FENOC, how is he supposed  
7 to focus more resources on corrective actions if he is  
8 getting information from the NRC that says the safety  
9 culture seems fine?

10 MEMBER APOSTOLAKIS: Any questions?

11 MEMBER ROSEN: I have one, George.

12 MEMBER APOSTOLAKIS: Yes.

13 MEMBER ROSEN: David, I just don't  
14 understand the slide on -- which gets to the heart of  
15 the question for me, the methods for oversight, ROP  
16 slide. They don't have any numbers of them, but it's  
17 the one with the distribution on it.

18 MR. COLLINS: Yes.

19 MEMBER ROSEN: And what you're suggesting  
20 we do is analyze some data, these latent  
21 organizational weaknesses --

22 MR. COLLINS: Specifically, this data.

23 MEMBER ROSEN: -- data which we don't  
24 have.

25 MR. COLLINS: Well, okay. I'm not saying

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 you have it. I'm saying it exists.

2 MEMBER ROSEN: Well, tell me more about  
3 it. Since I don't have it, I haven't seen it, and,  
4 therefore, I don't know what it is.

5 MR. COLLINS: Okay. This is probably the  
6 disconnect between INPO and the NRC. INPO has asked  
7 all the plants to do three things in response to  
8 Davis-Besse. One is to train people on the event.  
9 Another thing is to assess the leadership skills  
10 necessary to maintain a safety culture. And the third  
11 one is to assess --

12 MEMBER ROSEN: Is this all in the SOER?

13 MR. COLLINS: Yes. There's three -- and  
14 this INPO guy here, he can talk more about it. And  
15 the third one was to assess the long-term issues that  
16 are out there, the latent organizational weaknesses.

17 MEMBER ROSEN: So that when INPO asks the  
18 plants to do that, this particular piece of paper is  
19 Millstone's --

20 MR. COLLINS: Yes.

21 MEMBER ROSEN: -- assessment, and it --

22 MR. COLLINS: Yes.

23 MEMBER ROSEN: -- and what kinds of things  
24 are there in it?

25 MR. COLLINS: Well, I don't know if Al

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 wants me to talk about that or not.

2 MEMBER ROSEN: Well, I'm not asking -- I'm  
3 just asking what are the categories of things.

4 MEMBER APOSTOLAKIS: The type of things.

5 MEMBER ROSEN: In Millstone.

6 MR. COLLINS: It all cuts across the  
7 spectrum. The categories of types of things that INPO  
8 asks for were long-term unexplained conditions. And  
9 some of them will have some risk significance.

10 MEMBER ROSEN: Those are the LOWs, those  
11 long-term --

12 MR. COLLINS: Yes. Some will have some  
13 risk significance, and some won't. And what I'm  
14 suggesting is that the ROP already has some pretty  
15 good tools for assessing risk, and you can see from  
16 that slide that they predicted 15 out of the last four  
17 of them. So they get some -- a lot of information on  
18 risk. But what do you do with that information? You  
19 don't want to hammer a plant, you know, unnecessarily.

20 So what I'm saying is, by distributing the  
21 plants on a normal distribution, a weighted  
22 distribution, so it's not just quantity but it's risk  
23 significance, and then what you do is you go after the  
24 plants that have the worst risk represented by the  
25 latent organizational weaknesses, and you tell that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 plant that that ROP performance indicator is going to  
2 stay that color until you put enough resources into  
3 your corrective actions program, until you get that  
4 down to where James Reason says you get that wheel of  
5 cheese that's got those holes in it. You get those  
6 holes down in size and number, so that you're back in  
7 this distribution where you don't represent an  
8 unreasonable risk.

9 DR. MURLEY: I would just comment, if I  
10 could, Mr. Chairman --

11 MEMBER APOSTOLAKIS: Sure.

12 DR. MURLEY: -- that unfortunately, David,  
13 plants with a poor safety culture would look at  
14 themselves and respond to the SOER by saying, "We  
15 looked real hard at ourselves, and we're just fine."

16 MR. COLLINS: That's why part of this --  
17 and I think I go back on this slide, methods for  
18 managing, is that the NRC's job would be to monitor  
19 how the plant is doing these. The resident inspector  
20 would have to go out and say, okay, let's take a look  
21 at -- are these people reporting responsibly?

22 MEMBER APOSTOLAKIS: So this dialogue that  
23 you would like to see institutionalized, this would be  
24 done by industry groups, not by us.

25 MR. COLLINS: No, it would be done by the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 plant.

2 MEMBER APOSTOLAKIS: By the plant.

3 MR. COLLINS: They could use this or any  
4 type of survey.

5 MEMBER APOSTOLAKIS: Right.

6 MR. COLLINS: Something that Dr. Carroll  
7 said is this survey is really the least important part  
8 of it. The important thing is you initiate the  
9 dialogues with the employees, and what's important  
10 about a survey is that you ask the kinds of -- the  
11 important -- that you ask the right questions.

12 And the Millstone culture surveys that  
13 were done typically had 150 to 200 questions and took  
14 about 40 minutes to fill out. This takes about five  
15 minutes to fill out. It really only asks three  
16 questions of everyone in your food chain. So it's  
17 really designed to be administered quarterly  
18 initially. And then, if there's no problems, maybe  
19 yearly.

20 So it's not a tremendous resource thing at  
21 all for the plant to do. It's not a difficult thing  
22 for the NRC to assess. And it's -- something that  
23 Edgar Schein said was --

24 MEMBER APOSTOLAKIS: So NRC will get into  
25 this?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1           MR. COLLINS: The reports, the summary  
2 reports. NRC isn't going to do any of this legwork,  
3 but the NRC will get the summary reports on the  
4 leadership. And all they'll do is watch to see that  
5 the leaders that show a bad -- you know, a culture  
6 that's substandard or -- will be corrected, where  
7 there will be some reinforcement coaching of those  
8 leaders to get them above some minimum.

9           MEMBER APOSTOLAKIS: So are you  
10 recommending, then, that this committee recommend to  
11 the Commission that something like this happen?

12           MR. COLLINS: Yes.

13           CHAIRMAN BONACA: But you said that the  
14 NRC will have to monitor that, in fact, they have  
15 properly provided --

16           MR. COLLINS: Right.

17           MEMBER ROSEN: That's not usual, Mario.  
18 The NRC always has to check to see that it's accurate.

19           CHAIRMAN BONACA: I'm trying to understand  
20 how that --

21           MR. COLLINS: Let me make a quick -- can  
22 I make a quick --

23           MEMBER APOSTOLAKIS: Sure.

24           MR. COLLINS: A quick comment is I read  
25 through a lot of pages of ACRS transcripts on safety

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 culture. One of the concerns that ACRS raised was  
2 they don't want to get into -- the NRC doesn't want to  
3 get into management's shorts. They don't want to get  
4 into the game of managing the plant.

5 I just wanted to quote something from  
6 Edgar Schein. He said, "If you can make a distinction  
7 between leadership and management, it's that leaders  
8 create the culture and managers live within the  
9 culture." So this isn't management. This is  
10 leadership that we're talking about, and there's a  
11 difference.

12 We're not just talking about the top  
13 leaders of the company either. We're talking about  
14 point leadership -- the people who are right where the  
15 rubber meets the road, who are right at -- you know,  
16 if it was Davis-Besse, the people doing the boric acid  
17 control. And so that's the dual message, really, that  
18 has to go out. But it's the same thing; it's  
19 leadership.

20 MEMBER APOSTOLAKIS: Any other questions?  
21 Last question. I notice that whenever you quoted  
22 somebody you included their picture.

23 (Laughter.)

24 MR. COLLINS: Not everybody. I'm sorry  
25 that --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER APOSTOLAKIS: Except for Mr.  
2 Sorenson, who --

3 MR. COLLINS: Well, actually, I quote you  
4 at the end, too, and I --

5 MEMBER APOSTOLAKIS: -- who didn't work  
6 for us. But Jack Sorenson, he deserves his picture --

7 MR. COLLINS: Is Mr. Sorenson here? All  
8 right. He is quite a guy. A very impressive -- once  
9 again, everybody has got to read that paper he wrote.  
10 It's really -- it's incredible.

11 And I apologize for not quoting you, too.

12 MEMBER POWERS: Let me ask just a question  
13 that continues to nag at me. Quite a few speakers  
14 have said, gee, these are the characteristics of a  
15 good or a bad safety culture, and it was really just  
16 an inverse, we'll convert it to the proper adjective.  
17 And if you look at these things, you'll decide what  
18 kind of safety culture you have.

19 But then, Mr. Collins, you pointed out  
20 that Davis-Besse had a superb material condition, few  
21 operator errors, which one or another speaker or  
22 various authors have characterized poor material  
23 conditions as indicative of a bad safety culture, and  
24 high operator errors as indicative of a bad safety  
25 culture.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           What I never see is something quantitative  
2           that says, oh, I've measured these characteristics  
3           that I think are indicative of a safety culture, and  
4           indeed when I compare that to the event rate at this  
5           plant, there's some sort of a positive correlation.

6           MR. COLLINS:        You want something  
7           quantitative on Davis-Besse?

8           MEMBER POWERS:    And what I know from Mr.  
9           Sorenson's work is that he did find within the  
10          chemical industry some characteristics of plants which  
11          had a positive correlation with some measure of  
12          events. But I never see the corresponding thing for  
13          the nuclear industry.

14          MR. COLLINS:    Okay. Let me -- I can  
15          sketch it out real quick for you. I'll just go back  
16          to a slide. This is a slide on Davis-Besse that I  
17          just skipped over and said if you want to come back to  
18          it we can, but I can give you an idea of what kind of  
19          quantitative analysis we can do to come up with the  
20          safety culture for Davis-Besse if you want.

21          MEMBER POWERS:   Well, that doesn't help me  
22          very much.

23          MR. COLLINS:    No? Okay.

24          MEMBER POWERS:    Because the going-in  
25          assumption is that Davis-Besse had a poor safety

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 culture. Okay? And so we'll find a correlation  
2 between something. I mean, you can look around and  
3 you will find some correlation.

4 What I'm looking for is a plant that has  
5 not had an event that you can find something to  
6 measure that says, "Will that plant have event?" and  
7 you can validate.

8 MR. COLLINS: A plant that has not had an  
9 event?

10 MEMBER POWERS: Well, I'm looking for  
11 something -- some correlation that has some predictive  
12 capacity to it. Not an after-the-fact sort of thing,  
13 because I always find something after the fact.

14 MR. COLLINS: I think the type of  
15 predictive capacity I'm talking about is -- and there  
16 may have to be some research to generate the type of  
17 statistics I think you're talking about, but if you  
18 look at statistics, let's say, on drunk driving, a  
19 drunk driver will drive about 100 times on average  
20 statistically before he gets into a serious accident.

21 So the assumption that I'm making is that  
22 the plants that live with a lot of these latent  
23 organizational weaknesses long term set themselves up  
24 statistically for more events. That's an assumption.

25 MEMBER POWERS: Yes. And what I'm asking

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 for is, is there any truth or validity to the  
2 assumption?

3 MR. COLLINS: I think the way to get your  
4 handle on that, if someone wanted to do a research  
5 project on it, would be to start with the INPO  
6 analysis of 20 most significant events, and take a  
7 look at the cultures. You'd have to kind of backfit  
8 the culture studies to these plants, and then take a  
9 look at the leadership behaviors and the  
10 organizational weaknesses for those plants and take a  
11 look if they're more significant than the average  
12 plant.

13 That's something I actually talked to the  
14 guy who wrote that paper about at INPO, and he thought  
15 it was a very interesting idea.

16 MEMBER POWERS: And the trouble is -- with  
17 that again is there's something blind about it. We  
18 know that an event has occurred.

19 MR. COLLINS: Well, then, what you do --

20 MEMBER POWERS: Therefore, I will  
21 interpret things in light of that.

22 MR. COLLINS: Well, then, what you do is  
23 you go to plants that, by whatever assessment the NRC  
24 or INPO has, considered the top performing plants, and  
25 then you do a similar study.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER POWERS: And sit around waiting for  
2 them to have an event.

3 MR. COLLINS: Well, I think you can  
4 probably use your ROP process at that point and take  
5 a look at some of the things that they've had and  
6 probably -- you know, you may not have an event like  
7 Davis-Besse, but you'll probably have --

8 MEMBER POWERS: Yes, I can define an event  
9 any way I want to.

10 MR. COLLINS: Right, right.

11 MEMBER POWERS: But I --

12 MR. COLLINS: Anyway, the point is there's  
13 many different ways to --

14 MEMBER POWERS: If that's the case --

15 MR. COLLINS: -- I think get at the  
16 solution that you're talking about.

17 MEMBER POWERS: If that's the case, if I  
18 can use the ROP, then I'm in good shape, because I've  
19 got the ROP. I don't have to do anything. I just sit  
20 there and wait.

21 MR. COLLINS: Right. Exactly. Exactly,  
22 that's right. You wait until you see --

23 MEMBER POWERS: Well, okay.

24 MEMBER ROSEN: But I don't think that's  
25 right, Dana. I mean, the ROP we have, but it doesn't

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 have the indicators in it that we need.

2 MEMBER POWERS: Well, he says it does.

3 MR. COLLINS: No, no, I'm not saying that.

4 I'm saying the ROP needs to be changed to do that  
5 normal distribution, so that when you're in the tail  
6 that your color changes on your ROP. We don't have a  
7 real risk assessment I think of LOEs that's connected  
8 to the ROP.

9 MEMBER ROSEN: LOEs? LOWs?

10 MR. COLLINS: I'm sorry. LOW, yes, latent  
11 organizational weaknesses.

12 MEMBER ROSEN: So they need to change the  
13 ROP to incorporate some of the information that you  
14 say is now being routinely collected but we don't see.

15 MR. COLLINS: Right. To connect the long-  
16 term latent organizational weakness risk items that  
17 the plants are now collecting in response to INPO,  
18 connect those to the ROP.

19 MEMBER APOSTOLAKIS: Can we have that or  
20 is that --

21 MR. COLLINS: It would be up to Alan  
22 Price.

23 MEMBER APOSTOLAKIS: Okay.

24 MEMBER ROSEN: I think what we need to do  
25 is let Mr. Price talk here at some point. Dana, why

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 don't you conclude when you're comfortable, but we do  
2 have one more presentation this morning.

3 MEMBER POWERS: Well, again, I mean, I --  
4 I see lots of things saying -- I have no difficulty,  
5 actually, with the fact that we can't define safety  
6 culture. I can't define defense-in-depth very well  
7 either, but I live with that.

8 So the fact that we can't define safety  
9 culture doesn't bother me very much, but I see lots of  
10 people saying this is indicative of a good safety  
11 culture.

12 MR. COLLINS: I would disagree that we  
13 can't define safety culture. I would ask people to  
14 read the definition I gave.

15 MEMBER POWERS: Well, let me stick with  
16 mine. I think I --

17 MR. COLLINS: Okay.

18 MEMBER POWERS: I think I am on safe  
19 grounds when I quote Professor Apostolakis by saying  
20 there is no universally-accepted definition of safety  
21 culture.

22 MR. COLLINS: I think until that becomes  
23 the case, I think probably the first thing for safety  
24 culture would be to get some kind of a task force that  
25 the ACRS might --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER POWERS: That's not my point.

2 MR. COLLINS: No, I'm saying it's a huge  
3 point. For managing culture, if you don't define it  
4 clearly, that's your basis for managing safety  
5 culture. You have to start with that. If you don't,  
6 you're never going to be able to really manage  
7 culture.

8 MEMBER POWERS: My point is that I see  
9 lots of people telling me this is indicative of a good  
10 safety culture, and that a good safety culture will  
11 prevent you from having events. But I don't see  
12 anything quantitative. I don't see -- I mean, they  
13 seem plausible enough to me, but I --

14 MR. COLLINS: Is a normal distribution --  
15 is that quantitative enough for you? Wouldn't that be  
16 quantitative?

17 MEMBER POWERS: I would like to see  
18 something that borders on a correlation.

19 MEMBER APOSTOLAKIS: Yes, this is a  
20 subject more appropriate for the general discussion  
21 later. But I think the point has been made.

22 Is there a clarification question here?

23 MEMBER RANSOM: A comment.

24 MEMBER APOSTOLAKIS: Go ahead.

25 MEMBER RANSOM: I was very glad to hear

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 you talk about leadership and its importance, and, you  
2 know, and the management caring for the people, you  
3 know, who work in the organizations. The only comment  
4 I have is it seems like these attitudes in management  
5 organizations persist through many, many years, the  
6 ones I have worked for maybe 10, 20 years.

7           You can go in and find that they still  
8 have the same kind of characteristics in their  
9 management style that they had 10 years ago or 20  
10 years ago. So the problem I see is when you find bad  
11 management, which I think has a big effect on the  
12 culture and safety culture, what do you do about it?

13           MR. COLLINS: I think there is, in my  
14 view, a misconception about culture in that it takes  
15 years and very, very slow change. I don't think  
16 culture change is a function of time at all. I think  
17 it's a function of expectations and reinforcing  
18 expectations.

19           If Alan Price here were to tell everyone  
20 at Millstone they need to wear a red shirt tomorrow or  
21 they're not going to be allowed access to the plant,  
22 I guarantee you everyone at the plant is going to be  
23 wearing a red shirt tomorrow. It's just a question of  
24 the expectations that you set and how you reinforce  
25 those expectations.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER RANSOM: It's a lot more subtle  
2 than that I think.

3 MR. COLLINS: I would --

4 MEMBER RANSOM: It's the arrogance of the  
5 management style, you know, that an organization has  
6 created over time, and it's passed on from generation  
7 to generation.

8 MR. COLLINS: You can certainly get an  
9 entrenched, arrogant management style, and I  
10 definitely saw that at Millstone. And I've got to  
11 tell you, it's no fun working at a plant like that.  
12 But I also tell you it can change instantly if you get  
13 dynamic leadership in there that sets a different  
14 course, and I saw that at Millstone II.

15 MEMBER RANSOM: The only one I've seen is  
16 in National Labs, where you throw out one management  
17 team and bring in another one. There is a definite  
18 change.

19 MR. COLLINS: What I'm hoping is that  
20 there will be a method in place, instilled by the  
21 plants, so that if you do have an arrogant,  
22 unacceptable management team, one that's toxic to  
23 culture, one that's toxic to safety, that the NRC ROP  
24 drives change and doesn't let that stand.

25 MEMBER APOSTOLAKIS: Let's move on now and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 maybe we can revisit these issues during the panel  
2 discussion.

3 The last speaker for this morning is Mr.  
4 Alan Price.

5 MR. PRICE: Good morning.

6 MEMBER APOSTOLAKIS: Good morning. Maybe  
7 you can take one of the microphones.

8 MR. PRICE: Oh, thank you. Is that  
9 better? Can you hear me now?

10 You mentioned early on to please describe  
11 why we're here. Clearly, I'm here because I was  
12 issued an invitation.

13 (Laughter.)

14 I wasn't sure why I was issued an  
15 invitation.

16 MEMBER APOSTOLAKIS: You could have  
17 refused, of course.

18 MR. PRICE: Oh, I didn't realize that was  
19 an option.

20 (Laughter.)

21 I've been with Dominion for 24 years. I  
22 began my career at Surry Power Station. And in 1996,  
23 when the three units at Millstone were shut down, I  
24 had the offer to go to Millstone at the time for what  
25 I thought was going to be a fairly brief period, and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 I was there for close to three years. Most of that  
2 time was spent as the plant manager for Unit Number 2  
3 during the recovery.

4 When the plant was purchased by Dominion  
5 just over two years ago, I had the opportunity to go  
6 back in June of 2001, and I'm now the site vice  
7 president. So I presume that has some of the reason  
8 for me being invited to speak.

9 The slide behind me you'll see on the  
10 left-hand margin there is an open lock, and as we  
11 proceed forward through the next set of overheads  
12 you're going to see keys for the lock. I thought very  
13 seriously about trying to find a picture of a chain  
14 with a broken link, because we're only as good as the  
15 weakest link in the chain.

16 The first overhead that I have is the  
17 definition of safety culture, which we have gone over  
18 several times today. I am going to leave it up --  
19 request that we leave it up just as a backdrop for an  
20 opening statement.

21 I don't know what else I can add after Mr.  
22 Dugger and others have preceded me this morning with  
23 regard to the effect that leadership and senior  
24 management has on the safety culture for an  
25 organization. And I truly appreciate the positive

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 comments that Dave Collins made about me personally.

2 From my perspective, it's much more of a  
3 struggle than Dave gives me credit for. I believe  
4 that it is slow and constant, slow and steady, and it  
5 is definitely walking the talk. It's leading by  
6 example, and it's also -- I think it takes much longer  
7 to change the culture of an organization, and at least  
8 my current experience is that it's taking longer than  
9 I ever thought that it would.

10 I also believe that if I make a bad  
11 decision, or if senior management makes a bad decision  
12 -- when I say "I," I'm not referring to myself  
13 personally, but rather senior management -- if senior  
14 management makes a bad decision, its impact is prompt,  
15 and its impact goes through the organization very  
16 quickly. And its impact from a single act can have an  
17 impact that lasts for a long time.

18 Trying to change things for the better,  
19 trying to achieve standards of excellence, however,  
20 takes constant reinforcement over and over and over  
21 again. And the things that senior management would  
22 like to have happen in the plant is not always what --  
23 those characteristics are not always exemplified in  
24 the organization immediately.

25 If we could go to the next overhead on the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 safety culture model, please.

2 Many of the attributes of a safety culture  
3 that we've heard about this morning I believe are  
4 properly presented on this overhead. What this  
5 represents is a three-tier approach. One is at the  
6 corporate level, where policies are established to  
7 depict what the overall policy and organizational  
8 characteristics that are desired by the corporation.

9 For Dominion, this includes our nuclear  
10 safety policy. It also includes our principles of  
11 professionalism. The two things that are included in  
12 the nuclear safety policy and the principles of  
13 professionalism is we try to make a tie from the  
14 corporation to the individual team member at the power  
15 station, no matter who it is, no matter whether it's  
16 the reactor operator on the bench board or the  
17 individual who is delivering the boric acid from the  
18 warehouse to the aux building where we're going to  
19 make a boric acid batch.

20 Everyone at the plant owns nuclear safety,  
21 and one of the things that we try to do is we try to  
22 personalize that, so that everybody understands that  
23 they own part of reactivity management. And we are  
24 all stewards of the plant, and we all represent the  
25 plant to the local community as well as the global

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 community.

2 On the left-hand side, the plaques that we  
3 have around the power station has a large red circle  
4 around it with the words "you are here," and we use  
5 those in our management meetings. What we try to do  
6 is we try to drive home to the people in management,  
7 from first-line supervisors right through to senior  
8 managers at the power stations, that this is the  
9 regime where we normally operate.

10 We're the people who are representing what  
11 the corporate policies are.

12 MR. PRICE: We're the people who are  
13 living the nuclear safety policy and their principles  
14 of professionalism every day. We're the folks who are  
15 demanding rigorously that we do the pre-job briefs  
16 before we go out even on the most mundane activity,  
17 because a mundane activity remains mundane when things  
18 go as you expect, but a mundane activity can quickly  
19 turn into an accident situation if things don't go as  
20 you expect. So we try to drive home to our managers  
21 that you can't take the eye off the ball even if  
22 there's something out there that you think is quite  
23 routine.

24 And then at the individual level, as I  
25 said before, through our training programs, through

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the interactions that we have with the Plant staff,  
2 whether it's in the pre-job briefs, whether it's in  
3 department meetings, tailgate meetings, post-job  
4 briefs, all-hands meetings or whatever series of  
5 meetings that we have, we try to reinforce the  
6 individual responsibility. Would you go to the next  
7 overhead, please.

8 Senior plant managers' role. It's our  
9 duty and responsibility to affirm and articulate a  
10 strong safety culture vision. That's not only the  
11 words that we say in the plaques that hang on the wall  
12 but as I've indicated before also the actions that we  
13 have. We have to establish clear organizational  
14 values and priorities. That's everything through our  
15 business plan right down through our outage goals,  
16 what our acceptable industrial safety accident rate  
17 is, what plant key performance indicators we're going  
18 to track. We have to be accountable ourselves and to  
19 expect organizational accountability and encourage  
20 teamwork and to build trust within the organization.

21 It's not just a management thing, it's a  
22 management thing that includes every member on the  
23 team so that there's an environment that exists where  
24 anybody on the team is encouraged to bring forth a  
25 question or an example of a degraded plant condition

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and know that that individual is going to be listened  
2 to. That individual may not go away happy, but the  
3 individual should go away knowing that he's been  
4 listened, he's had an opportunity to air his or her  
5 thoughts or concerns. And also if he or she is not  
6 happy or satisfied with the answer that someone in  
7 management is providing, they need to know that  
8 there's a work environment that exists at the power  
9 station where they have other avenues that they can go  
10 and express their opinions without fear of retaliation  
11 -- intimidation, retaliation or discrimination or  
12 harassment.

13 We also need to understand and expect the  
14 organization will share an understanding of the  
15 details. What that means is that we can't just trust  
16 that -- I can't just trust that what I say is going to  
17 actually manifest itself in performance at the power  
18 station. We have to follow up, which means being in  
19 the field, observing and not doing drive-by  
20 observations but going out and having meaningful  
21 interactions with the client staff. It means  
22 recognizing that our business is not an eight to five,  
23 five days a week business; it's 24/7, 365. And senior  
24 managers need to be in the Plant talking with the  
25 plant staff on off-hours, on weekends, nights and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 holidays in various different work environments. And  
2 what that means is we need to be visible, we need to  
3 be vigilant and we need to champion safe operations.

4 I'm going to talk about three departments  
5 today. I'm going to talk about plant operations, I'm  
6 going to talk about plant maintenance, and I'm going  
7 to talk about plant engineering. Plant operations,  
8 the operators in the Plant, this is the PEOs right up  
9 through the shift managers, need to know that we  
10 demand and we respect conservative operational  
11 decisions. Sometimes a conservative decision is  
12 manually trip the reactor from 100 percent power.  
13 Sometimes a conservative decision is don't start the  
14 Plant up. Sometimes a conservative decision is I've  
15 got a unexpected degraded condition on the unit, and  
16 we really should not be maneuvering the unit right at  
17 this time, the Plant is stable, let's get the degraded  
18 condition repaired and then we'll maneuver the unit if  
19 necessary.

20 There needs to be an extreme commitment to  
21 training, not only the fundamental training for the  
22 reactor operators in the Plant, equipment operators  
23 but also the continuous training that we learn  
24 internally or within our company or externally  
25 throughout the global community. We always need to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 try to learn from others' mistakes in a training  
2 environment rather than replicate them at our own  
3 plant with either a unit of power or in a shutdown  
4 condition.

5           Operations sets the standard of the Plant.  
6 What we tell our operators is that the Plant will  
7 never exceed the command and control, the rigor, the  
8 diligence that exists in the control room. So you all  
9 set the standard, you have set the bar as high as it's  
10 going to go. The Plant can always perform at a lesser  
11 value than you all set in the control room, but if you  
12 don't set the highest standards of excellence in the  
13 control room, then the rest of the Plant will never  
14 reach those levels of excellence that we desire.

15           Defense-in-depth of plant management,  
16 making sure that we maintain our safety systems, we  
17 always maintain those degrees of redundancy. And  
18 degrees of redundancy are not only in plant equipment  
19 -- charging pumps, HPSI pumps, LPSI, containment spray  
20 -- it's also in how we make our decisions. If you're  
21 an unexpected or an unusual situation, one of the  
22 things that I require of my shift managers when we're  
23 training them or when somebody's up for a promotion to  
24 a shift manager is don't think that you're carrying  
25 the world on your shoulders. If something unusual

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 comes up, we have a number of telephones in the  
2 control room for a reason. Pick up the telephone and  
3 call somebody and get some assistance.

4 Risk-informed decisions, I believe very  
5 strongly in the risk-informed environment that we're  
6 in now. I think that it's helping us make better  
7 decisions, and I'm a huge proponent of it. Adherence  
8 to procedures, we have to have good quality  
9 procedures, we have to have been trained in their use,  
10 and then we have to go out and adhere to those  
11 procedures. If we can't adhere to those procedures,  
12 then we need robust processes to get the procedure  
13 changes done. I've already spoken to continuous  
14 learning.

15 And the last thing that I'll mention is on  
16 the focus on nuclear safety. As we were going through  
17 the SOER 0204 training, I personally conducted, either  
18 myself or when I was not at the power station my  
19 senior directors conducted the training, we remind our  
20 folks that while we're in a training environment, we  
21 have two nuclear reactors right across our alleyway  
22 that have nuclear boiling sites right now, and no  
23 matter what decisions we make with regard to training  
24 or administrative processes or questioning attitudes,  
25 the reactor demands that the heat be safely removed

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 from it and never ever forget it. And that brings it  
2 right back to our principles of professionalism.

3 What we ask of our plant maintenance staff  
4 is adhere to plans, procedures and schedules.  
5 Sometimes there's a balance when -- perhaps balance is  
6 not the correct word -- sometimes there's a struggle  
7 when we get into our refueling outage or an outage of  
8 a piece of equipment. Is there a sense of urgency to  
9 adhere to the schedule? Is there an oversense of  
10 urgency to adhere to the schedule. I believe that  
11 there needs to be a sense of urgency to adhere to a  
12 schedule. Schedules are developed to make sure that  
13 we have proper coordination between different crafts,  
14 that we have adequate margin to limiting conditions of  
15 operations. So we ask our maintenance staff to get  
16 involved very early on, make sure that our schedules  
17 and our scope of work is appropriate, that they're  
18 well thought out, and then when we have a schedule  
19 established stick to the plan. If you can't stick to  
20 the plan, make people's phones or pagers ring very,  
21 very quickly.

22 We need a strong interface between  
23 maintenance and plant operations, and this is plant  
24 operations, the bit "O," which includes operations and  
25 engineering. Someone mentioned earlier in one of the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 models that was up there that there could be a  
2 different safety culture in Engineering, Operations  
3 and Maintenance. Is that a good thing or a bad thing?  
4 I personally believe that that's a good thing if we  
5 handle it correctly. I think that one of the  
6 strengths of our business if we leverage it  
7 appropriately is the diversity that our industry has.  
8 People in Maintenance look at the world through a  
9 different set of glasses than the people in Operations  
10 or the people in Engineering. If we can bring that  
11 collective together in a healthy respectful  
12 environment, we're a lot better off than just  
13 listening to one group of people or to expect that  
14 we're going to have the same culture in each of those  
15 organizations.

16 Strong quality assurance programs. I like  
17 an intrusive quality assurance program. I like an  
18 assertive quality assurance program. I think that  
19 having an assertive quality assurance program helps us  
20 rub the two pieces of metal together, perhaps, and  
21 keep it nice and shiny and keep a nice sharp edge at  
22 the power station. So I like it when our QA auditors  
23 of QC inspectors or whomever come in and say, "We went  
24 out and we saw this. This is what we saw, we didn't  
25 like what we saw." Gets us together and helps us

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 improve.

2 Continuous learning, I've mentioned that  
3 before. A strong operating experience program. That  
4 includes internal operating experience as well as  
5 external operating experience.

6 The last thing I'll mention is craft  
7 ownership. I love it when I go out in the field and  
8 you don't need the first-line supervisor to exhibit  
9 craft ownership, it's the mechanical in the valve or  
10 the electrician in the breaker that you just have  
11 confidence that that individual is not going to leave  
12 that piece of equipment until they can guarantee that  
13 it's going to work to their satisfaction.

14 Moving to Engineering, I believe a healthy  
15 Engineering Department understands and controls their  
16 design basis. They establish and they maintain a  
17 strong and healthy set of engineering programs. These  
18 are your high-energy line break programs, your  
19 Appendix R programs, the EQ programs and the like. I  
20 also believe that there needs to be a healthy and  
21 respectful interface with Operations, Maintenance and  
22 Training. You've got to have the engineers working  
23 elbow to elbow with the operators in the Maintenance  
24 craft. They need to know each other by name, they  
25 need to know who the system engineers are. The system

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 engineers need to be in the Maintenance shop and in  
2 the field and understand their equipment. The  
3 operators in the Maintenance craft need to know who to  
4 call when they have an equipment problem.

5           Engineering is a very tough job, in my  
6 opinion, these days. There are many more demands made  
7 of our Engineering Department than they can ever  
8 achieve. They can't please everybody, and sometimes  
9 our Engineering management feels like they're pleasing  
10 nobody. They have to attend to day-to-day operations  
11 to make sure the Plant operates today safety and  
12 reliably. They also have to think long term, where  
13 are we going to be two years from now? We need to  
14 have resources allocated to this modification that  
15 we're not going to implement for another two refueling  
16 cycles. Sometimes that doesn't give you the  
17 satisfaction when you're going home, when the engineer  
18 goes home and says, "Gee, I met my milestone today.  
19 We're going to be successful two years from now." The  
20 engineer doesn't feel nearly as good as knowing that  
21 he went home and was out in the aux building working  
22 with a craft or an operator getting a heat exchanger  
23 repaired.

24           And then the engineers need to help us  
25 assess equipment reliability. How are we making use

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 of operating experience? How are we evaluating our  
2 equipment officer license? Do we see degrading  
3 equipment problems based on the trends that we see,  
4 whether it's from our Section 11 programs, our ISI  
5 programs or our vibration monitoring?

6 Moving to employee training and skill.  
7 The balance here is highly skilled operators and  
8 technicians, use of industry, internal and external  
9 OE, use of the training programs. When we benchmark,  
10 one of the biggest benefits I think we get of  
11 benchmarking is attributes that we can come back and  
12 we can put out in our training program so that we can  
13 learn in a simulated environment and make mistakes in  
14 a simulated environment before they're transferred  
15 into the operating environment.

16 Management knowledge of the Plant. Our  
17 Company is a strong believer that people in senior  
18 management positions need to have a knowledge of the  
19 Plant, need to have a diverse background, need to know  
20 what the operators are doing, need to know what the  
21 craft is doing, need to know what's happening in the  
22 training environment in the RP and the chemistry  
23 areas. This includes controlled management rotation  
24 and use of mentors to make sure that we're continually  
25 improving and that our managers are not getting stale

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and also that a department is not hearing only one  
2 person's perspective of how to do business. So we do  
3 do reasonably frequent rotation and fairly frequent  
4 use of mentors.

5 Performance monitoring, programs need to  
6 be robust in measuring and paying attention to trends,  
7 whether it's vibrations thermography, human  
8 performance errors, industrial safety accident rates,  
9 contaminated square footage. We have well over 100  
10 key performance indicators that we monitor at our  
11 Plant.

12 Predictive risk analysis, if we're going  
13 to have a refueling outage or a forced outage or take  
14 a piece of equipment out of service or a system out of  
15 service, proactively do risk-based analysis to make  
16 sure that what we're doing is appropriate and we have  
17 taken the appropriate compensatory actions. Use of  
18 internal and external performance assessments, that's  
19 using our own hen house resources as well as inviting  
20 others in to assess our performance.

21 And work environment feedbacks. Mr.  
22 Collins mentioned earlier some surveys that he is  
23 personally associated with. We have done surveys and  
24 interviews as part of our recommendation for the SOER  
25 0204. We also do at least on an annual basis

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 management surveys where we get that feedback on  
2 management knowledge, skills and abilities at the  
3 power station.

4 Plant investments. It takes a lot of  
5 resource to maintain our plants and to have them  
6 prepared for future long-term reliability. I believe  
7 that in an appropriate safety culture there's a  
8 consistent model that's used to help management  
9 prioritize where it's resources are going to be  
10 allocated, and I'm talking resources of the human  
11 resource, the dollars, the materials, the engineering.  
12 I believe that a good way to inculcate safety culture  
13 into your decision making process is to ask yourself  
14 is this modification or activity going to improve  
15 safety of the plant, is it going to improve industrial  
16 or environmental safety for the plant, is it a  
17 regulatory requirement, is it a equipment or plant  
18 reliability requirement, and, last, what's the return  
19 on investment for the utility?

20 So where does the Plant staff come in?  
21 Employee behaviors, sensitivity to degraded plant  
22 conditions, a willingness to question unusual or  
23 unexpected results, a focus on continuous learning,  
24 demanding for the management team that they be  
25 provided adequate training, a focus on human

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 performance, which includes peer coaching and peer  
2 monitoring in the field, not only of themselves, the  
3 people that they work with but also senior management.  
4 Just yesterday at one of our management meetings I was  
5 given some observations, and I asked our management  
6 team, am I only the person that gets coaching from the  
7 Maintenance craft when I'm in the Plant, because I get  
8 coaching all the time. Maybe it's just me. Also  
9 willingness to advance items that they feel is  
10 important to safety.

11 Which brings me to my next to the last  
12 slide, I believe. That's the safety conscious work  
13 environment. Employees at all levels need to be  
14 knowledgeable of the avenues that they have to advance  
15 their concerns, and they need to have confidence that  
16 they can advance their safety concerns without fear or  
17 reprisal. We've conducted extensive training for our  
18 employee staff as well as our management team. We've  
19 provided alternate paths for employees to pursue their  
20 concerns, which includes a senior management review of  
21 potential or perceived reprisals and a shared trust  
22 and respect at all organizational levels.

23 Some of the metrics that we use to assess  
24 our safety culture is equipment reliability. What are  
25 the performance trends of the systems and components?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 What are our long-range plans, are we planning for the  
2 future? What about our forced outages, how many have  
3 we had, how have we performed? And then how are we  
4 doing on our refueling outage planning and execution?  
5 From an organizational effectiveness perspective, have  
6 we done integrated cross-functional assessments, and  
7 what have they told us and what are we doing about  
8 them? How is our reactivity management, are we having  
9 events, are we having precursors? What are the  
10 trends? What are we doing about it?

11 How effective are we using our operating  
12 experience? Has it be inculcated throughout the  
13 organization? Do we do leadership assessments? What  
14 are we doing with the leadership assessments? And I  
15 think, very important, are we providing back to the  
16 Plant staff what the leadership assessments are  
17 telling us? At our power station, we do them and we  
18 do provide feedback to the Plant team. And then with  
19 regard to adherence to standards, how are we doing  
20 with regard to procedure, quality, use and adherence,  
21 our commitment to training and corrective actions?

22 While the units were offline, a very  
23 detailed set of metrics were developed that got you to  
24 a number for safety culture, which included these  
25 types of attributes. Each was weighted for its

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 significance and then there was an algorithm that went  
2 in, and every month we trended our safety culture  
3 index. We have modified that over time as the needs  
4 of the station and performance of the station have  
5 changed. We still monitor safety culture index. We  
6 use these types of metrics and we look for trends. We  
7 look not only for trends but we look for specific  
8 individual activities or events, precursors,  
9 transients that need to tell us something.

10 I guess in closing I know that one of the  
11 questions that's been asked of a number of presenters  
12 before me is should we pursue regulation with regard  
13 to safety culture? I personally do not believe that  
14 we should. I believe that the current regulatory  
15 process is more than adequate for giving us the tools  
16 that we need. I also believe that we are getting very  
17 valuable feedback from our resident inspectors as well  
18 as our visiting inspectors and from senior NRC  
19 management. I believe that if we try to regulate  
20 safety culture and we try to put a set of metrics in  
21 that is a one-size-fits-all for every power station in  
22 the United States, that we're going to miss something,  
23 and then two years from now we're going to be back  
24 saying what did we miss, what other regulations should  
25 we put in place? I think the current regulatory

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 infrastructure is adequate, I think it's up to us just  
2 to implement it appropriately. And that concludes my  
3 presentation.

4 MEMBER APOSTOLAKIS: Thank you very much.  
5 Steve?

6 MEMBER ROSEN: Okay. What sort of  
7 additional information should we ask for, if any, from  
8 the plants?

9 MR. PRICE: What sort of additional  
10 information should you ask --

11 MEMBER ROSEN: Yes, data, indicators we  
12 get on safety culture. Is there something that we  
13 should be doing different than what we've done before,  
14 in your view? I understand you don't think we ought  
15 to recommend to the Commission that there be new  
16 regulations. I happen to share that view, but there's  
17 a lot you can do short of new regulation.

18 MR. PRICE: Yes.

19 MEMBER ROSEN: And is there something that  
20 you think the staff and the ACRS ultimately should see  
21 short of regulation in terms of information, perhaps  
22 indicators, perhaps some of the things you just laid  
23 out on your last slide and the data from those  
24 efforts, all to the idea of looking for trends or  
25 changes that one could then say, "Hey, Alan, this is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 different than it used to be. Do you see these  
2 differences? Are they meaningful?"

3 MR. PRICE: I really don't know. That's  
4 my answer, I don't know. I know that for -- I was at  
5 our Surrey Plant for 16 years, and the culture, the  
6 work environment, the needs of Surrey were very, very  
7 different from our North Anna Plant and very different  
8 from our Millstone Plant. I believe that our senior  
9 executive management recognizes the difference in the  
10 needs, recognizes the differences in the weaknesses  
11 between the three locations, and we don't use a one-  
12 size-fits-all. So for me to try to give you an answer  
13 that you all could apply to over 100 plants I just  
14 don't think I can do that.

15 MEMBER ROSEN: Do you think we should ask  
16 the plants what they think makes sense for them to  
17 submit and to avoid the one-size-fits-all question?  
18 Would that make sense? Because I recognize that makes  
19 sense, not to have a one-size-fits-all --

20 MR. PRICE: I think it would make sense to  
21 ask licensees how they assess their safety culture.  
22 I think that would make sense. In effect, that's what  
23 INPO has done of the individual licensees as part of  
24 the SOER. And I think it's been very healthy for us  
25 to do that. That gives us the flexibility to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 determine what is appropriate for our power stations  
2 with where we are in our time and give an assessment  
3 for ourselves, what type of environment that would be  
4 done in. What type of protocol would be used, I don't  
5 know, but I do think that would be appropriate.

6 I think it's also appropriate, and we will  
7 do this, to share the results of our SOER reviews with  
8 our resident inspectors. I believe that we have  
9 already done that. So a lot of this work has already  
10 been done and is done on a monthly basis for us.

11 MEMBER APOSTOLAKIS: Any other questions?  
12 Tom?

13 MR. MURLEY: I regret that I have to leave  
14 for an airplane in about ten minutes. I agree with  
15 what Alan just said, though, that it may be the best  
16 approach, if you accept that we're not ready yet for  
17 a regulation in this country of some kind, but to ask  
18 the utilities themselves how do you measure your own  
19 safety culture? That could get them -- some do, some  
20 do a very good job, like David said. It might be best  
21 if it were an industry initiative with some help from  
22 NRC prodding along the way.

23 MEMBER APOSTOLAKIS: Yes. I'd like to  
24 come back to what Mr. Price said. I do appreciate the  
25 point that you don't want to see any new regulations.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Now, I assume that means rules, but would you object  
2 to what Tom Murley presented, some sort of regulatory  
3 intervention in the -- again, I come back to my  
4 earlier point: We have an action matrix here which is  
5 part of the reactor oversight process. Its first  
6 column is really the most benign one. It says  
7 licensee response column.

8 Basically, what the agency does is tells  
9 the licensee you're all green but here are some  
10 problems that you may want to look at. That would be  
11 a form of intervention which can be either after the  
12 second box or after the first box in the diagram that  
13 Tom showed us. And the mere fact that the NRC is  
14 raising the question attracts attention by the utility  
15 and usually there is a response. Would you object to  
16 something like that, to make it a little more  
17 systematic, perhaps, so that we make sure that all the  
18 regions do this or maybe they're doing it already, I  
19 don't know.

20 MR. PRICE: It's not so much that I would  
21 object to it, it's that I believe that almost all of  
22 us are already doing it, so it's a question of making  
23 use of what we are already doing. So I believe that  
24 all the tools are there. I also believe that the  
25 interactions are already taking place with the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 resident inspectors as well as with regional  
2 management. It's a question of what are we doing  
3 about it.

4 MEMBER APOSTOLAKIS: But don't we have a  
5 problem, though, if we say, yes, all the tools are  
6 there, and yet Davis Besse happened. And as someone  
7 said earlier, we can't really regulate this industry  
8 based on averages, everybody has to be on board. How  
9 would that look to the public? I mean one of the  
10 strategic goals of the Commission is to enhance public  
11 confidence in our activities and of course in nuclear  
12 power plant safety. How would it look if the  
13 Commission said, "Yes, Davis Besse happened but what  
14 can you do? It was an exception. We have all the  
15 tools we need so we're not going to do anything about  
16 it." Would that help us in gaining public confidence  
17 in what we're doing. By we I mean the Agency, but you  
18 can extend that a little looking at really the input  
19 in the industry. And by the way, it seems to me we're  
20 moving now into the general part of the discussion, so  
21 anybody who wants to participate please feel free.

22 MR. PRICE: It's my opinion that safety  
23 culture is very subjective -- I'm sorry, the  
24 measurement of safety culture is subjective: How far-  
25 reaching do you want to go? Dave has brought with him

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 one of the early outputs from our review of  
2 unexplained conditions at our power station. I don't  
3 agree that all of those represent latent  
4 organizational weaknesses. Some of them are just  
5 unexplained things or recurring problems that we just  
6 have not taken care of over the years.

7 I also believe that the regulatory  
8 processes' expectations have changed over the two plus  
9 decades that I've been associated with the industry,  
10 and it's not like under the ROP process, we've just  
11 now had a significant event. We've had other  
12 significant events under the SALP process and under  
13 other enforcement processes. So I don't think it's a  
14 failure of the current regulatory process. I think  
15 the current regulatory process has a lot of strengths  
16 in helping us look at the risk associated with  
17 activities and with deficiencies that are identified.

18 I think that depending on what the  
19 decisions of the ACRS are, that good intentions that  
20 you all may have could have unintended consequences  
21 for the industry. For us to assess safety culture,  
22 I'm not saying that we need to do things outside of  
23 the light of the day and in closed rooms that you all  
24 are unaware of, but for us to assess our safety  
25 culture and for us to assess our management and our

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 leadership we need to be very, very critical and we  
2 need to be very critical sometimes subjectively.

3           Someone was asking earlier how can we come  
4 up with a set of metrics that are predictors of future  
5 failure? That's tough to do, but I think you all know  
6 that that's what management's all about. When we're  
7 assessing a first-line supervisor's performance or a  
8 senior manager's performance or a site Vice  
9 President's performance, my boss is looking at how I'm  
10 conducting my business, what type of decisions am I  
11 making, how am I expressing myself, how effective is  
12 the unit being operated, and it's his job to make sure  
13 that I'm removed before we have a significant event.  
14 So that's not part of the regulatory process, but  
15 those things happen every day in our industry.

16           MEMBER APOSTOLAKIS: Anybody who would  
17 like to address this issue? The issue in my mind is  
18 would we enhance public confidence in this Agency if  
19 we say the regulatory system is fine, David Besse was  
20 an outlier and do nothing? Let's give the Panel  
21 first, I'll come to you. Please. You have to have a  
22 microphone in front of you. Go ahead.

23           MR. KEISLER: Can you hear me now?

24           MEMBER APOSTOLAKIS: Sure. No, it's for  
25 the reporter.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. KEISLER: There is precedence. ASME  
2 Section 11 was an entire retrofit code on an existing  
3 industry, not just the commercial industry, all the  
4 experimental reactors, everything in the nation.  
5 That's exactly why there were over a pair of programs,  
6 replacement programs. Where you go from here I don't  
7 know. There are a lot of things in place, but the  
8 whole concept underlying and the underpinnings are  
9 still evident within that code body, the actual  
10 documents. The diversity what's there to reach back  
11 in and have everyone that needed to be but at the same  
12 time there was control. And that data started coming  
13 in, and you keep adjusting to that, and you set an  
14 ongoing process within there.

15 So the issue of safety culture now began  
16 through all of breach. In fact, I don't know of ever  
17 sitting an inquiry session in 20 years that allowed  
18 the cladding to be taken credit for as a pressure  
19 boundary. It's a point of law. The code becomes law  
20 by incorporation. There's been a year and a half of  
21 discussion about how they protected everything. It's  
22 a moot point. But there are strategies and those  
23 things have been used. It is an arduous process, but  
24 it becomes a continuum too, and you set in motion to  
25 do. And one key example of that would be ASME 11 and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1       how it was retrofitted into evolution over the long  
2       haul as to how that brought it into play to where it  
3       is now used in the sites by the industry. He  
4       mentioned in his slides how he takes credit for those  
5       programs, a vital part of managing that Plant.

6                   MR. WHITCOMB: Dr. Apostolakis, I would  
7       just like to try to address your question perhaps with  
8       one perception. With respect to the findings of the  
9       Inspector General's Office in December regarding the  
10      safety culture of the NRC, my sense is that the public  
11      is concerned that there are some safety culture issues  
12      within their own regulatory agency that's tasked with  
13      protecting its interest. So to do nothing perhaps  
14      wouldn't bode well or support that perception, and I  
15      think that it would only manifest itself and grow.  
16      And I think there's a mistrust because of information  
17      that comes in spurts and pieces and doesn't always  
18      appear to be forthright. And I think that that  
19      coupled with this perception or the findings that the  
20      NRC itself has to wrestle with its own internal  
21      problems apart from the industry I think is a concern  
22      for the public at large.

23                   MEMBER APOSTOLAKIS: Please identify  
24      yourself.

25                   MR. MEYERS: I'm Lew Meyers. I'm with

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 FENOC, and I present later today so I've got to watch  
2 how I ask this question. You know, I'll talk about  
3 Davis Besse, and my advice is look at Davis Besse as  
4 a plant. When Davis Besse event happened, I was the  
5 VP of another plant, and I had to respond back from  
6 the other plant from a regulatory process and an INPO  
7 process and everything else on the material condition  
8 of the reactor vessel head at the plant I was working  
9 at. I had to respond back in a certified letter, I  
10 had to have telephone calls, and I had to do  
11 inspections. And I look at the differences of the way  
12 we approached the issue at the plant that I worked at,  
13 the same company, versus at Davis Besse. So there's  
14 plants and there's differences in plants, like Mr.  
15 Price talked about a while ago and the cultures and  
16 the behaviors of the unions and everything else.

17 But then I always step one step higher and  
18 I look at the industry through INPO's eyes and the  
19 regulatory process through the NRC's eyes. And what  
20 I'm proud of today sitting here is that the industry  
21 experience that we had in this country and others  
22 drove us to assess our heads and forced us to shut  
23 down and go really do a thorough inspection of the  
24 heads that we have today in this country. And as a  
25 result of that, you know, there was no real Davis

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Besse loss of integrity. We were fortunate, and it  
2 wasn't as timely as I'd like to have seen it, but  
3 somewhere along the line you all guys got to realize  
4 that the process that you had in place did work. I'm  
5 not talking about Davis Besse, I'm not talking about  
6 the NRC process. It did work. It protected the  
7 health and safety of the public. Now, do you have  
8 enhance that? I don't know. But it did work. That  
9 would be my comment.

10 CHAIRMAN BONACA: Something mundane but  
11 it's important too I would like to point out. We just  
12 found out that the cafeteria is going to close today  
13 at one o'clock.

14 MEMBER SIEBER: Why?

15 CHAIRMAN BONACA: Because there is some  
16 ceremony. So my suggestion would be that maybe you  
17 wrap up by 12:30, leave at least half an hour for  
18 people to get something to eat and continue the  
19 discussion in the beginning of the second session,  
20 however you want to handle it.

21 MEMBER RANSOM: Or we can start at 1:30.

22 CHAIRMAN BONACA: Yes. We'll start it  
23 again at 1:30. Or whatever. I mean we can continue  
24 for ten minutes, but at least we leave some time for  
25 people to feed themselves.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 CHAIRMAN APOSTOLAKIS: Okay. Any other  
2 comments? Yes, please.

3 MR. COLLINS: I'd just like to say that I  
4 believe that there's a couple of NRC inspection  
5 procedures for safety culture and for a corrective  
6 actions program. And after -- it seems like what  
7 happens is we don't flag any problems until after an  
8 event like Davis Besse, and then we say, "Oh, the  
9 safety culture is terrible or the corrective action  
10 program is terrible at this plant." And I think that  
11 we're at the point now where we really need to -- the  
12 NRC really needs to take a look at those tools that  
13 they use to assess those things and whether they  
14 should keep using them in the form that they are.

15 Because the problem is if you're feeding  
16 information to an operator like FENOC that you're not  
17 really sure of, I mean right now we're all sitting  
18 here saying that -- or at least Chairman Meserve said  
19 last year that safety culture hasn't been clearly  
20 defined, so we can't -- NRC or anyone else hasn't  
21 found a way to unambiguously measure it. Well, if  
22 that statement is true, then what business does the  
23 NRC have telling plants that their safety culture  
24 looks fine? That's my comment.

25 CHAIRMAN BONACA: Well, let me go back to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the issue of Davis Besse now. We have an event, and  
2 at the end of that one could conclude that you have an  
3 isolated event and so we will react to it accordingly.  
4 And the other possibility is that a number of  
5 indications then are found which corroborate or  
6 substantiate the perspective that says, oh, there is  
7 a safety culture issue. That came out pretty quickly.  
8 I mean we were just looking at what evolved there, and  
9 the number of the indications that were brought to  
10 bear were, for example, action statements on a very  
11 frequent basis. Well, very unusual and yet didn't  
12 anybody notice that? And so the clogging of the  
13 filters and a lot of other things that happened.

14 Now, the conclusion of that is there is a  
15 safety culture problem, and now we're all jumping on  
16 safety culture. So let me forget about safety culture  
17 now and simply say how did we miss, not only the Plant  
18 but also the NRC and everybody else, this issue, these  
19 indicators that were telling us something was going  
20 on? Okay? I mean it just is a legitimate engineering  
21 technical question. I mean it's a just a legitimate  
22 leadership question. How did we miss this?

23 And the next question is for safety  
24 culture that's okay, but it's so much more intractable  
25 than safety culture. Let's just talk about the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 indications and what can we do at other plants today  
2 to make sure if we see these indications we jump on it  
3 and infer, and we are raising issues about questioning  
4 attitude and so on and so forth. And that's simply  
5 the facts of the matter now. I'm afraid at times when  
6 we begin to say all these indications are safety  
7 culture and now we jump on safety culture we really  
8 lose sight somewhat of what the job has to be. And so  
9 what we're looking for here, I think, is also some  
10 perspective from people with experience in running  
11 power plants and from NEI and everybody else on what  
12 can we learn that we can put in place so that an event  
13 like Davis Besse will not occur again, and I think we  
14 all have the same objective there. I mean nobody's  
15 trying to say our objective is to regulate safety  
16 culture, it's just simply to prevent that lapse from  
17 occurring again.

18 CHAIRMAN APOSTOLAKIS: Yes. To expound on  
19 this, does the Safety Review Board have a question,  
20 are they really doing anything or are we just  
21 visiting, saying -- receive a few presentations, say  
22 a few nice words and leave? Where was INPO? I mean  
23 we have to answer these questions first. For years  
24 now I've been hearing here that INPO has these great  
25 programs to do this and this and that, but they can't

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 tell us about it because it's proprietary. Well,  
2 where were they? I mean they are famous for being  
3 very frank with plant management. Did they forget to  
4 be frank this time? These are the real issues I  
5 think. I mean on paper it looks very good. You have  
6 the plant, you have external oversight, you have the  
7 NRC inspectors, and then the whole system seems to  
8 collapse. Why? Why? Why did that happen?

9 CHAIRMAN BONACA: One disturbing element  
10 is some of the elements that we normally consider  
11 attributes of safety culture as an effective  
12 corrective action program seem to be okay. That's  
13 really the message we got. I mean it wasn't that bad.  
14 Now, when you say it wasn't that bad about a situation  
15 like Davis Besse it means it probably was pretty good,  
16 and so on and so on. So that's the other intriguing  
17 part, that some of those attributes that we normally  
18 consider elements of safety culture as indicators were  
19 not so bad after all. So that's why we're left with  
20 that puzzling question about how do we prevent a  
21 repeat in the future. I mean not necessarily that  
22 there's going to be one. I'm saying --

23 CHAIRMAN APOSTOLAKIS: Do the Panel  
24 members care to make a comment on this?

25 MR. WHITCOMB: Yes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 CHAIRMAN APOSTOLAKIS: You don't have to.

2 MR. WHITCOMB: I would like -- before I  
3 address that specifically, I'd like to echo what Mr.  
4 Collins said about reassessing what the tools are in  
5 place. And the reason I say that's twofold. On the  
6 afternoon of the same day that it was reported at a  
7 public meeting the problem with the reactor vessel  
8 head, the NRC had an exit and gave Davis Besse all  
9 green in performing assessment -- performance  
10 assessment, okay? Now, later, perhaps six weeks  
11 later, there's a determination that this is -- the  
12 root cause is a safety culture issue, okay, which  
13 perhaps wouldn't have been identified through the  
14 normal routine assessment of plant performance.

15 But I would echo Mr. Collins' concern from  
16 a little different perspective. In 1985, at Davis  
17 Besse there were the independent failure of 14  
18 different systems, and that's why they issued a  
19 blistering assessment as to the superficial  
20 maintenance practices. Now, that was 18 years ago, 17  
21 years before the identification of the reactor vessel  
22 head. How did we ever let that get to that point  
23 where we were once again surprised by that very same  
24 plant that had the same kinds of problems? That's the  
25 issue of safety culture that truly hasn't been

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 addressed in any of the assessments. And particularly  
2 when they get a glowing all green report card it just  
3 is unfathomable.

4 And the public is concerned, Mr.  
5 Apostolakis. They really are concerned because  
6 they're scratching their heads saying how can we have  
7 such great performance reviews but have this near  
8 disaster? So I think there has to be a review, and I  
9 think it's got to go beyond that. I think there has  
10 to be a new road paved. I agree with Mr. Price,  
11 there's a lot of things that are being reported, and  
12 I think to a large degree many of the plants are doing  
13 the right things, and they are assessing their  
14 culture, because that's the right way to manage. But  
15 for those who don't give the same attention to that,  
16 I believe their guidance needs to be put in place.  
17 Thank you.

18 MR. COLLINS: Can I just mention what I  
19 think is probably the single most fundamental issue  
20 for measuring safety culture? And I've been  
21 corresponding with this Dr. John Carroll of MIT who  
22 wrote this wonderful paper, I recommend people reading  
23 it, really analyzing Millstone, but he's also studied  
24 many different nuclear plants' safety culture. And  
25 what he says, and it's part of my presentation, and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 this is shared by INPO as well, that, well, INPO says  
2 the most important source of information is the  
3 worker, and Dr. Carroll says we need to start  
4 institutionalizing dialogues with workers.

5 Now, after Davis Besse there was a root  
6 cause report done and it said that a large amount, I  
7 believe, of the Operating staff felt like the keys  
8 were taken away from them starting early '90s. Is  
9 that a good characterization, Mr. Meyers? And I think  
10 that was very similar to what happened at Millstone,  
11 and I also believe it talked about the focus on the  
12 cost control as being part of the issue.

13 So really I obviously respect -- I don't  
14 want to say anything what the Panel is saying, but I  
15 don't think we need safety culture studies done of  
16 Millstone right now because I think the culture is  
17 great, but I think we would definitely need the NRC to  
18 take a look at the Millstone culture before 1996. So  
19 can we leave it up to the licensees to just manage it  
20 on their own? I think there needs to be at some point  
21 something -- some involvement by the NRC that can  
22 remove toxic leadership when it gets installed.

23 CHAIRMAN APOSTOLAKIS: Is this idea of  
24 getting feedback from the workers isn't this what the  
25 Japanese industry did with the quality surplus, not

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the nuclear industry, where they had these -- I think  
2 that's what it is. They had managers and workers  
3 getting together in groups of eight to ten.

4 MR. COLLINS: There's models of Japanese  
5 and also Saturn in this country, they have the same --

6 CHAIRMAN APOSTOLAKIS: Saturn, yes.

7 MR. COLLINS: -- quality surplus.

8 CHAIRMAN APOSTOLAKIS: Which was more than  
9 the Japanese.

10 MR. COLLINS: Right.

11 MR. KEISLER: Some of the private work  
12 done in what was going on in this nation, and I  
13 interfaced with Patel Human Affairs Research Centers  
14 substantially through this period. I knew a number of  
15 people through the code activities individually just  
16 like you guys know everyone. They did a number of the  
17 comparative analyses for this nation against the  
18 Japanese industry, the European industries, against  
19 FAA and aerospace industries domestically. Also what  
20 was evident then, and it was overall efforts to assess  
21 the status of maintenance at the domestic industry now  
22 that the larger plants were coming into play and  
23 larger numbers of them. But they had not dissected  
24 what was going on at the leading plants in this  
25 nation, and I happened to have worked close in with

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the leadership of those in my own career, which was  
2 the essence of why I went back to look in detail to go  
3 through that.

4 But what you're seeing there, there were  
5 modified quality surplus plants, there were  
6 psychologists on staff working to create  
7 programmatically the innovation I cited, Mr. Ollie  
8 Bradham with the V.C. Summer Plant. Ollie had been  
9 the Maintenance Superintendent at Oconee, and actually  
10 when he had executive migration into the start-up of  
11 the V.C. Summer Plant, I would go back to what Mr.  
12 Price said, different plants were there. And that was  
13 true in Duke with Catawba and MacGuire versus Oconee  
14 and the culture changes and differences.

15 V.C. Summer and also being a very small  
16 utility with one reactor but they implemented some of  
17 the lessons learned that were not well-documented  
18 through that era. There was no INPO at that time at  
19 all, but we went back in and what were the elements of  
20 that and very formal programs to assure that those  
21 craft personnel had access all the way to the Board of  
22 Directors if they needed that and set up of  
23 architecture procedurally, programmatically and then  
24 actually brought in professional expertise of  
25 psychologists to work with and to do that. And they

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 went to a couple other plants in the nation in 1987  
2 and that's what was the premise of my point in talking  
3 about a generation digress now, we moved in the other  
4 direction. We were headed there, it didn't captured  
5 in all the official documentation, as I understand it.

6 CHAIRMAN APOSTOLAKIS: Okay. I think  
7 we're pressed for time now. So before we recess, I'd  
8 like to ask the Panel members, are there any issues  
9 that you would like to raise that were not discussed  
10 so we can spend 15 minutes with the same panel after  
11 lunch or do you believe we've covered everything and  
12 this is it for Panel 1?

13 MR. WHITCOMB: I think I have nothing else  
14 to raise.

15 CHAIRMAN APOSTOLAKIS: Very good. So  
16 thank you, gentlemen, for coming here. This was very  
17 helpful to us. We'll recess until 1:40. Thank you.

18 (Whereupon, the foregoing matter went off  
19 the record at 12:39 p.m. and went back on  
20 the record at 1:40 p.m.)

21 CHAIRMAN BONACA: All right. It's time to  
22 start the meeting again. So we will resume the  
23 meeting with the second panel discussion.

24 CHAIRMAN APOSTOLAKIS: Okay. The subject  
25 of this afternoon's panel is attributes of safety

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 culture, which is of course what the ACRS is really  
2 interested in, whether we can define these attributes  
3 and maybe measure some of them. We'll follow the same  
4 rules as this morning. Please try to keep to your  
5 time to allow, the allotted time. And then we'll have  
6 some discussion and then at the end we'll have a  
7 roundtable discussion.

8 The first item on the agenda is the  
9 overview and status of the NRC staff's activities.  
10 Mr. Trimble?

11 MR. TRIMBLE: Thank you. My name is Dave  
12 Trimble. I'm the Chief Operator in Licensing and  
13 Human Performance Section within the NRR staff. And  
14 as you'll see shortly, the Commission has tasked the  
15 staff with monitoring efforts of foreign regulators to  
16 measure and regulate safety culture and the  
17 effectiveness and monitoring efforts to develop  
18 objective measures and indicators of safety culture.

19 We're currently doing this through a team  
20 from across offices, and it consists of Team Leader,  
21 Clare Goodman, who's on my left, who will be  
22 presenting the details of the information that is in  
23 this presentation. And Clare is our -- as a Senior  
24 Human Factors Analyst within my section. Also,  
25 although he's not actively participating in this panel

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 discussion, Jim Bongara is also on the team of my  
2 staff. I also have Lisamarie Jarriel. Lisa is -- you  
3 want to stand up, Lisa? Lisa is the Agency's  
4 Allegation Advisor. And we also have -- she's within  
5 NRR. And we also have Dr. J -- Julius J. Persensky  
6 who's from the Office of Research, and I don't think  
7 Jay's in the room right now but he will be shortly.  
8 And he's also a member of the team.

9 Consistent with the mission of this team,  
10 several of the members, Clare, Lisamarie and Jay, are  
11 also members of the NRC inspection team working on the  
12 -- looking into the Davis Besse issue.

13 Our purpose today is to -- go to the next  
14 slide -- just to give you an overview, we want to,  
15 first of all, refresh everybody's memory as to what  
16 the current guidance that we have provided by the  
17 Commission, and then we're going to list the set of  
18 attributes of the safety culture that was developed by  
19 the -- under the IAEA's auspices, the International  
20 Safety Advisory Group and set forth in INSAG 15, which  
21 I was very impressed with when I first read that  
22 document. And, anyway, it certainly represents a lot  
23 of thinking that's evolved on the issue, but -- well,  
24 we use those as sort of a baseline document. And for  
25 each attribute we will describe what characterizes

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 these attributes and then what guidance we have  
2 against these attributes, what guidance we currently  
3 have.

4 And I want to say on the outset we  
5 currently assess and monitor safety culture within the  
6 inspection program, but it's on a limited basis. And  
7 we'll try to show you what we do and then give you a  
8 little flavor for what we don't do. At the end, we'll  
9 provide some conclusions regarding our plans. And  
10 simply put, our plans are to try and work within the  
11 guidance that we've received from the Commission. And  
12 if we do find that we see a need for regulatory  
13 enhancement, then we would be obligated and we would  
14 plan to go back to the Commission to basically get  
15 their buy-in and approval to move into a new area.

16 I want to now -- again, time is limited,  
17 but I want to shift seats here with Clare Goodman as  
18 our team leader. I'd like Clare to go through those  
19 attributes, and then we'll get on with the discussion.

20 MEMBER POWERS: Well, maybe just ask you  
21 one question --

22 MR. TRIMBLE: Please.

23 MEMBER POWERS: -- before I leave.  
24 Suppose that you said, "Gee, we've got to regulate in  
25 this area," wouldn't you have to do a backfit

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 analysis?

2 MR. TRIMBLE: Yes, we would.

3 MEMBER POWERS: How do you do a backfit  
4 analysis?

5 MR. TRIMBLE: How would you do it?

6 MEMBER POWERS: Yes.

7 MR. TRIMBLE: I think it was mentioned  
8 this morning that it could be difficult and  
9 challenging. I haven't really thought about it  
10 enough, Dr. Powers, to know whether it would be  
11 impossible or not but it certainly would be  
12 challenging.

13 MEMBER ROSEN: What you really mean, Dana,  
14 I think is if you wanted to establish a new rule to  
15 regulate in this area without a backfit analysis.

16 MEMBER POWERS: No, you can't regulate --

17 MEMBER ROSEN: But you couldn't establish  
18 a new rule.

19 MR. TRIMBLE: Yes. That's a good point.

20 MEMBER POWERS: If you try to impose new  
21 requirements on a reactor, you have to do a backfit  
22 analysis.

23 MEMBER ROSEN: If you try to impose new  
24 requirements, that's right. But I'm not talking about  
25 that.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. TRIMBLE: Right.

2 MEMBER ROSEN: I'm talking about what you  
3 look at within the scope of what you have.

4 MR. TRIMBLE: Right. If you have -- yes.  
5 In other words, if you -- I think what you're saying  
6 is if you were to enhance your inspection program or  
7 something, it may not -- of course, you'd have to be  
8 very careful in that area that you're not through the  
9 inspection program --

10 MEMBER ROSEN: You're adding new  
11 requirements.

12 MR. TRIMBLE: -- putting new requirements,  
13 right. But maybe in the monitoring area, NRC staff  
14 monitoring.

15 MEMBER SIEBER: Even with that you can't  
16 impose a monitoring data requirement except by  
17 agreement with the industry or with the licensee.

18 MR. TRIMBLE: Yes. That's my  
19 understanding.

20 MEMBER SIEBER: Right.

21 MR. TRIMBLE: We're going to do a  
22 switcharoo here and let Clare have the microphone.

23 MS. GOODMAN: Although I've been known to  
24 speak plenty loud enough that I don't need a  
25 microphone. Just as some background for some people,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 I've been working on the NRC staff since 1980 in a  
2 number of areas of Human Performance. And if I put up  
3 my hand, can you see, that means the next slide.

4 I'm going to basically skip over this  
5 fairly quickly because this morning we went over the  
6 definition for safety culture. NRC is using the  
7 definition, as Thadani indicated this morning, that  
8 was put forth in INSAG 3 and 4. And also in the  
9 nature of time I'm going to move to the current  
10 Commission guidance fairly quickly. As Dave  
11 indicated, I'm going to go through what currently is  
12 our Commission guidance and within the boundaries that  
13 we're operating at the moment.

14 First on this list is a 1989 policy  
15 statement. It was probably issued during Tom Murley's  
16 time as NRR Director on the conduct of operation. And  
17 it's the only regulatory document that we have that  
18 directly addresses safety culture. It starts out by  
19 stating that, "The Commission believes that the  
20 working environment provided for the conduct of  
21 operations at nuclear power facilities has a direct  
22 relationship to safety." It also states that,  
23 "Management has a duty and obligation to foster the  
24 development of a safety culture," and it does use the  
25 word, "safety culture," "at each facility and to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 provide the professional working environment in the  
2 control room and throughout the facility that assesses  
3 safe operations." And throughout this talk I'll give  
4 a couple more quotes from that policy statement.

5 The Commission has also provided further  
6 guidance in three staff SRMs that have been issued  
7 that are listed here. The first SRM, issued in 1998,  
8 approved only the current staff practice of inferring  
9 licensee management performance from performance-based  
10 inspections, routine assessments and event follow-up.  
11 That SRM specifically said that efforts to develop  
12 leading indicators of performance should not use  
13 licensee management performance or competency as an  
14 input, and the inspection program should focus on  
15 performance-based inspection findings. And, lastly,  
16 that SRM eliminated resources directed at developing  
17 a systematic method for inferring management  
18 performance.

19 Probably the most important thing that  
20 came out of this SRM is that NRC should not be  
21 addressing management competencies. And I think it's  
22 important language-wise that that SRM was addressing  
23 management competencies more than it was safety  
24 culture as we're talking about today.

25 In the second SRM, which was mainly about

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 safety conscious work environment, but at that point  
2 the definitional differences between safety conscious  
3 work environment and safety culture were used  
4 interchangeably, so it's unclear if the guidance was  
5 referring just to safety conscious work environment or  
6 also to safety culture. But the guidance of that SRM  
7 was the staff should continue with current policy with  
8 the addition of development and implementation of  
9 additional guidance and training in support of more  
10 complete and consistent program implementation. It  
11 didn't further give any details.

12           Lastly, and more recently, the Commission  
13 in an SRM this year issued quite a bit of guidance on  
14 safety conscious work environment, and at the end of  
15 that SRM had two additional points related to safety  
16 culture. Those points were that the staff should  
17 monitor the efforts of foreign regulators to measure  
18 and regulate safety culture and assess their  
19 effectiveness. In particular, because the  
20 subjectivity is a principal objection to the direct  
21 regulation of safety culture, the staff should monitor  
22 efforts to develop objective measures, indicators of  
23 safety culture. And that's probably the most recent  
24 guidance that we've received.

25           This slide lists the key issues of safety

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 culture from INSAG 15. I'll refer to them as  
2 attributes. Others have referred to them as  
3 principles or elements. In any event, they're the  
4 selected topics by the International Nuclear Safety  
5 Advisory Group, or INSAG, and these are the group of  
6 attributes that have resulted from a maturation of a  
7 number of documents.

8 First, INSAG 3, which dealt with basic  
9 principles of safety, to INSAG 4, which specifically  
10 dealt with safety culture, all the way through INSAG  
11 11, which dealt with developing safety culture and  
12 practical suggestions for utilities to use. INSAG 13  
13 dealt with the management of operational safety. And,  
14 finally, the document, INSAG 15, dealt with a number  
15 of attributes that are listed here for safety culture.  
16 And I think the important thing to take away from this  
17 slide is that this is an international set of  
18 principles that have wide applicability and cut across  
19 multiple cultures and applications.

20 The first attribute, commitment to safety,  
21 means that safety is put clearly and unequivocally in  
22 first place from the top of the organization. There's  
23 absolute clarity from the organization safety  
24 philosophy. The following slide addresses some of the  
25 places that NRC talks about this type of commitment.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER POWERS: Does your previous slide  
2 mean that you're demanding that organizations say  
3 safety is  
4 their number one priority?

5 MS. GOODMAN: Correct.

6 MEMBER POWERS: That can't possibly be.

7 MS. GOODMAN: Yes. I heard you this  
8 morning that -- I think it's best stated that  
9 management exhibits safety first practices. And by  
10 that we're not talking about the ultimately shutting  
11 down the facility because the only way for a facility  
12 to be safe is shut down.

13 MEMBER POWERS: Yes, but some of our  
14 facilities are not safe if we shut down.

15 MS. GOODMAN: Yes, that true.

16 MEMBER POWERS: It would be bad to shut  
17 down a spent fuel pool.

18 CHAIRMAN APOSTOLAKIS: Why are you giving  
19 us the INSAG 15 attributes? Is there anywhere -- did  
20 the Commission say you should look at those?

21 MS. GOODMAN: No. The guidance from the  
22 Commission is limited to three SRMS --

23 CHAIRMAN APOSTOLAKIS: Right.

24 MS. GOODMAN: -- that we received. I'm  
25 using those attributes because those are the best

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 definition for safety culture and attributes of safety  
2 culture agreed upon at the moment by a panel of  
3 experts, they've matured over time, a number of years,  
4 a number of committees have met that have led to the  
5 development of these attributes. And I'm using these  
6 attributes to show you where there are pieces of NRC  
7 regulatory rules or guidance and where there are not.  
8 It's more a methodology to sort of present what we do  
9 cover and what we don't cover.

10 CHAIRMAN APOSTOLAKIS: Okay. Okay.

11 MS. GOODMAN: So it's an effective list to  
12 start from.

13 CHAIRMAN APOSTOLAKIS: So you may go back  
14 to the Commission then and give some recommendations  
15 at some point --

16 MS. GOODMAN: Yes.

17 CHAIRMAN APOSTOLAKIS: -- regarding the  
18 ones that are not covered.

19 MS. GOODMAN: Yes.

20 CHAIRMAN APOSTOLAKIS: Okay.

21 MS. GOODMAN: The policy statement on  
22 conduct for nuclear power plant operations, I've read  
23 from it already, it also says that, "Management must  
24 provide the leadership that nurtures and perpetuates  
25 the safety culture." It says that, "The starting

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 point for the necessary full attention to safety  
2 matters is with the senior management of all  
3 organizations concerned." And it, lastly, sort of  
4 wraps up by saying, "Management should review their  
5 procedures and policies on the conduct of operations  
6 to assure they support an environment for professional  
7 conduct."

8 We also have technical specifications that  
9 require certain administrative controls related to  
10 organizations, including PORC and other senior  
11 management review groups, and we also have an SRP that  
12 has some limited guidance.

13 So in summary, we have limited coverage of  
14 this attribute, and we should in particular understand  
15 that policy statements are not directly enforceable,  
16 they're not rules.

17 Next attribute, use of procedures. Very  
18 quickly, this states what the characteristics are of  
19 that attribute. Procedures need to be clearly  
20 written, simple, understandable, fit for their  
21 purpose, appropriate for task and accomplish what is  
22 needed to maintain safe operations.

23 The next slide identifies a number of  
24 areas where the NRC does have some rules and guidance.  
25 Appendix B addresses procedures directly. Reg Guide

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 1.33 endorses ANSI 3.2, which provides a list of  
2 activities that should be proceduralized. Also, there  
3 are inspection procedures. There's one inspection  
4 procedure listed here. Now, the copies of your slides  
5 that you have are a prior one where I listed some  
6 supplemental inspection procedures. Under the reactor  
7 oversight process, we have baseline procedures, and  
8 then we have special inspection procedures or  
9 supplemental inspection procedures, such as this 95003  
10 and then we have further supplemental procedures, such  
11 as plant procedures or EOPs or human performance that  
12 could be used in conjunction with 95003 if that was  
13 the appropriate issue that was being dealt with.

14 So, in summary, we have -- we've written  
15 guidance that cover this attribute, though to some  
16 extent implementation is restricted by the ROP process  
17 because a number of our items are in supplemental  
18 procedures and not part of the baseline.

19 The next attribute deals with conservative  
20 decision making. Most incidents in the industry occur  
21 because somebody failed to consider or question in a  
22 conservative manner decisions that they've made, and  
23 this slide is just a list of those characteristics.  
24 The next slide provides again a number of places where  
25 NRC does provide documentation or guidance to the two

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 inspection procedures listed here, 71111.15 and  
2 71111.14, are part of the baseline ROP process. So  
3 they would be conducted at all plants on a regular  
4 basis.

5 The operability evaluations reviews  
6 evaluations to ensure that operability is properly  
7 justified and that components or systems remain  
8 available. The personnel performance baseline  
9 inspection procedure reviews personnel performance  
10 during planned non-routine plant evolutions or non-  
11 routine unplanned events. It also reviews all LERs.

12 Lastly, the policy statement, again the  
13 same one that I talked about previously on conduct for  
14 operations, addresses this attribute by stating that  
15 open attitudes are required in such staff to ensure  
16 that information relevant to plant safety is freely  
17 communicated. When errors of practice are committed,  
18 their admission is encouraged. By these means and all  
19 pervading safety thinking is achieved allowing an  
20 inherently questioning attitude. The prevention of  
21 complacency, a commitment of excellence and the  
22 fostering both of personal accountability and  
23 corporate self-regulation in safety matters.

24 So, in summary, we have a number of  
25 specific indirect guidance in this area, but we have

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 a limited coverage in the global sense of conservative  
2 decision making. And, again, just to repeat what I've  
3 already said, the policy statements of course are not  
4 directly enforceable.

5 The next attribute is reporting culture.  
6 The characteristics are listed in this slide. In  
7 summary, in this particular area, we have a fair  
8 amount of coverage of this attribute. There is a  
9 policy statement -- go on to the next slide -- there's  
10 a policy statement on freedom to raise safety concerns  
11 which sets forth expectations that licensees will  
12 establish and maintain safety conscious environments  
13 in which employees feel free to raise safety concerns,  
14 both to their management and to the NRC, without fear  
15 of retaliation. A safety conscious work environment  
16 is critical to a licensee's ability to safely carry  
17 out licensed activities. The baseline procedure, IP  
18 71152, which is called the identification resolution  
19 of problems, has been revised to give guidance to  
20 inspectors on the topics of willingness to raise  
21 safety concerns.

22 The next attribute is challenging unsafe  
23 acts and conditions. This attribute speaks to the  
24 process for identifying, reporting and correcting  
25 unsafe acts in the plant. An important feature of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 this attribute is that employees are fully involved in  
2 the process and are trained to know how to challenge  
3 in a constructive way. The next slide.

4 This attribute is a cost-cutting issue in  
5 the reactor oversight process, or ROP. In the ROP  
6 process, it's addressed through the inspection  
7 procedure IP 71152. A fundamental goal of actually  
8 the NRC's ROP process is to establish confidence that  
9 each licensee is detecting and correcting problems in  
10 a manner that limits the risk to members of the  
11 public, and in fact a key premise of the ROP process  
12 is that weaknesses in licensee's problem,  
13 identification and resolution programs will manifest  
14 themselves as performance issues which will be  
15 identified during the baseline inspection program or  
16 by crossing performance indicator thresholds. And so,  
17 in summary, we have a fair amount of coverage for this  
18 particular attribute.

19 The next attribute, learning organization.  
20 This is a little bit trickier. If an organization  
21 stops searching for improvements in new ideas by means  
22 of eliminating say benchmarking or seeking out best  
23 practices, there's a danger that it will slip  
24 backwards. Ideally, all employees are involved  
25 proactively and --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER POWERS: What does that mean that  
2 there's a danger it will slip backwards?

3 MS. GOODMAN: Operational experience and  
4 benchmarking both are crucial ways that a facility can  
5 find out about either prior near misses at their  
6 facility or at other facilities. And I -- can you --  
7 am I answering your question or --

8 MEMBER POWERS: It's to slip backwards.  
9 If somebody stays constant, how do they slip  
10 backwards? That's what I'm struggling with.

11 MR. TRIMBLE: I think the point was that  
12 if you're not -- it's one of these things that you --  
13 the old saying is if you're not out there constantly  
14 looking at how others are doing, others are improving  
15 around you, are you keeping up with them, not that we  
16 have a rising standard necessarily but for the  
17 organizations that don't keep looking, then obviously  
18 have missed opportunities to find problems.

19 MEMBER POWERS: This sounds like the  
20 continuous improvement kind of philosophy that the DOE  
21 likes to pursue with their facilities, and I thought  
22 we were smart enough in this Agency to avoid that kind  
23 of thing.

24 MR. TRIMBLE: Well, like I said, I was  
25 trying not to go so much at the rising standards as

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 more as the missed opportunities. I don't know  
2 whether you call it going backwards, but at least you  
3 miss the opportunity to see some other event or see  
4 other issues at facilities, and I guess that's what we  
5 --

6 MEMBER POWERS: I think you want to avoid  
7 the accusation of ratcheting.

8 MS. GOODMAN: Yes. I don't think we're  
9 really speaking of ratcheting here. We are speaking  
10 of making yourself aware of near misses. Research has  
11 shown that approximately -- is it ten -- ten near  
12 misses occur for every event. Now, I could go back  
13 and get you more information on that, but if you miss  
14 those ten near misses and you don't know anything  
15 about those ten near misses, you've missed  
16 information. I think that this Agency does recognize  
17 that assessing operational experience, though, is in  
18 important. In fact, the prior Chairman of the  
19 Commission did at House testimony on Davis Besse did  
20 say, "The assessment of operating experience,  
21 integration of operating experience into training and  
22 review of program effectiveness action plan will  
23 provide for a comprehensive evaluation of the current  
24 programs for collecting, evaluating and disseminating  
25 operating experience."

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER POWERS:       I won't hold you  
2 responsible for that statement.

3                   MS. GOODMAN:    Yes.

4                   MEMBER POWERS:   How fortunate he's not  
5 here.

6                   MS. GOODMAN:    Yes.   And he was -- well,  
7 I'm quoting from some past testimony.

8                   CHAIRMAN APOSTOLAKIS:  But this, though,  
9 implies that you have a good root cause analysis  
10 methodology, right, in order to learn from the  
11 experience.  And if root cause analysis, say, stops at  
12 hardware failures, you really don't learn much.  I  
13 mean that's something that -- does the Commission  
14 encourage anybody to do that or does the industry do  
15 that?  I mean depends on --

16                   MS. GOODMAN:    I think in the new LER  
17 rules, although those people aren't here right at the  
18 moment, I think we did take a step in the direction of  
19 trying to get licensees to go considerably further  
20 when evaluating and writing up and LER to go into  
21 Human Performance items.  The guidance in NUREG 1022,  
22 is it, on LERs gives a number of human performance  
23 areas, and we do expect that they do discuss not just  
24 hardware failures.  And in fact when we review LERs  
25 still about half of the LERs, actually maybe a little

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 bit more than that, do contain and write up human  
2 performance items. So we do get feedback from the  
3 licensees on Human Performance. I'm sure the industry  
4 would feel that they very much are involved in  
5 reporting human performance. It may not be at the  
6 level of detail that we'd like but it's come a long  
7 way in the last 20 years.

8 CHAIRMAN APOSTOLAKIS: We are running out  
9 of time, so let's --

10 MS. GOODMAN: Yes. Okay.

11 CHAIRMAN APOSTOLAKIS: So what's your --

12 MS. GOODMAN: There are --

13 CHAIRMAN APOSTOLAKIS: Go ahead. I'm  
14 sorry.

15 MS. GOODMAN: Yes. Let me very quickly,  
16 maybe I can just skip through. With regard to  
17 training, we're definitely -- we have some guidance.  
18 We're possibly missing guidance on management  
19 training, but that may or may not be an issue here.  
20 We're not really ready to make recommendations in that  
21 area. The underpinning issues are communications,  
22 clear priorities and organization. Those three areas  
23 are covered by Appendix B which deals with corrective  
24 action, and we have a very limited coverage really  
25 with these attributes. We don't have certainly any

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 direct guidance in the area of communications.

2 Lastly, in conclusion --

3 MEMBER ROSEN: Before you get to the  
4 conclusion, one point about training. In the area of  
5 training, the Agency has agreed with the industry to  
6 support the National Academy for training and to use  
7 the requirements thereof in lieu of a rule on  
8 training.

9 MS. GOODMAN: Well, we have a rule on  
10 training --

11 MEMBER ROSEN: So in a sense -- but in a  
12 sense, we are coordinating with the industry on that  
13 one.

14 MS. GOODMAN: Most definitely. That does,  
15 as you well know, involve ten positions that are named  
16 -- or ten categories, positions, that are named in  
17 50.120.

18 MEMBER ROSEN: But to say that we don't  
19 have much on training is not exactly the whole story.

20 MS. GOODMAN: No, that's really not. I'm  
21 sorry, I was starting to rush. We are on --  
22 management training is not an area --

23 MEMBER ROSEN: Oh, management training.

24 MS. GOODMAN: That's what I meant to say.  
25 So in conclusion, the Commission has provided some

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 direction to the staff with regard to safety culture.  
2 They've directed us to monitor safety culture  
3 developments in the international arena and to monitor  
4 events, both domestic and international. In fact, our  
5 EEO Bill Travers recently chaired a meeting on safety  
6 culture of operational events.

7 In summary, we sample attributes to  
8 various degrees, but our program is limited. We don't  
9 have a process to look at issues as a set or a whole.  
10 We admittedly looked at safety culture from sort of  
11 performance individual facets rather than as a whole.  
12 In fact, using an overused cliché, we tend to focus on  
13 the trees and not the forest. You might say the  
14 forest is possibly still elusive.

15 CHAIRMAN APOSTOLAKIS: Well, the question  
16 that comes to my mind after your presentation is it  
17 appears that we are addressing various degrees, most  
18 if not all, of the attributes from INSAG 15, and yet  
19 we give all green to Davis Besse and then it happens.  
20 Something is missing here. I don't know what it is.  
21 Is it because of our limited involvement? Is it  
22 because these attributes are not a complete list? I  
23 mean they seem reasonable. What is it that creates  
24 that?

25 And if you are to make any recommendations

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 in a SECY, I assume, to the Commission, perhaps you  
2 should expand what you're doing and look at actual  
3 events. Mr. Thadani this morning had a slide where he  
4 said domestic events, Indian Point 2, Cooper,  
5 Millstone and David Besse. And go back and see what  
6 is it that happened there and if we had a reasonably  
7 good system covering these attributes, would we have  
8 prevented it or we would have known enough in advance  
9 to do something about it?

10 I think, as you pointed out, also as many  
11 others as well, operating experience is the most  
12 important input you can get, right, because that shows  
13 you how things really work. So I'm still puzzled. I  
14 mean we are past the first panel, we're beginning the  
15 second, and I still don't know why Davis Besse  
16 happened. I mean how can you help with me that?

17 MR. TRIMBLE: Well, I think, as I -- we  
18 did want to bring out the limitations of the program,  
19 as you referred to. It is limited in its scope, and  
20 I know this morning one or two of the speakers  
21 mentioned the dangers of making an assessment based on  
22 a limited program that can give you a false degree of  
23 confidence in the area. And I guess I have to say  
24 that we're in the thinking process. As we go and  
25 we're doing the inspection at Davis Besse, we're

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 learning and we're trying to keep an eye on, okay, is  
2 there a way that we could have or should have known  
3 about these problems, and I guess we haven't gotten  
4 the answer, but it's an open question and we're  
5 working on it. That's about the best I can do right  
6 now.

7 CHAIRMAN APOSTOLAKIS: One thought that  
8 occurs to me is, is it possible that because of Davis  
9 Besse we are focusing on the wrong things? We were  
10 urged this morning to bring behavioral scientists into  
11 the way we do business around here. If you look at  
12 Davis Besse, they explained away the indications they  
13 had and then some people argued that they didn't have  
14 the required questioning attitude to lead them to  
15 alternate models, alternate hypothesis that would  
16 explain also, which tells me now that maybe we should  
17 train them to understand uncertainties in models,  
18 which has nothing to do with behavioral science. It's  
19 an engineering issue, it's a risk assessment issue.  
20 So do our people out there understand that there may  
21 be very different hypotheses that can explain the  
22 symptoms and -- it's not just behavioral science here,  
23 and it seems that we are all focusing on safety  
24 culture because everybody says safety culture is  
25 important, and maybe it's an engineering problem.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER ROSEN: Well, George, I know you're  
2 pushing hard on this issue, but there are three people  
3 on this panel who I think would have a fairly good --  
4 ought to have a fairly good answer to that: Mr.  
5 Meyers, Mr. O'Connor -- not Mr. O'Connor, Mr. Meyers  
6 and Jack Grobe.

7 CHAIRMAN APOSTOLAKIS: Okay.

8 MEMBER ROSEN: At least, maybe Sonja.

9 CHAIRMAN APOSTOLAKIS: You guys know our  
10 charge, for you to answer this question.

11 MEMBER ROSEN: And they may be able to  
12 address why our regulatory system --

13 CHAIRMAN APOSTOLAKIS: I hope my point is  
14 clear.

15 MEMBER ROSEN: Yes, but you're pushing on  
16 the wrong spring.

17 CHAIRMAN APOSTOLAKIS: I'm not pushing,  
18 I'm just raising --

19 (Laughter.)

20 MEMBER SIEBER: There is an answer to  
21 this. The question is the same question as why didn't  
22 the PRA give you a probability that this event would  
23 occur. And the answer to that is underlying all the  
24 trees is a deterministic analysis of what can happen.  
25 And it turns out that nobody anticipated that leaking

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 boric acid in this configuration would lead to  
2 creating a large hole in the reactor vessel head.  
3 When you get to the point of should the utility have  
4 been able to identify it, the answer to that, in my  
5 view, is they probably should have. They should have  
6 questioned why the leak rate changed and went up.  
7 They should have questioned why the filters needed to  
8 be changed all the time. I mean there were  
9 indications out there that something was wrong, but  
10 not necessarily was there enough information to tell  
11 you you're eating a hole through the reactor vessel  
12 head.

13 I have another question, however, related  
14 to this presentation. It seems to me that if you take  
15 the INSAG attributes, INSAG 15 attributes, what you've  
16 really done is to look through Title 10 and policy  
17 statements and inspection procedures and so forth to  
18 try to match up do I have something that addresses  
19 some piece of one of these attributes, okay? And you  
20 can draw a conclusion, yes, I have an inspection  
21 procedure or a reg guide or Appendix A or Appendix B  
22 or something like that that addresses bits and pieces,  
23 but it certainly isn't comprehensive.

24 My question is in order for an inspector  
25 in the plant, the NRC inspector, to be able to get a

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 handle on safety culture, he would have to weave his  
2 way through the 15 or 20 different procedures and reg  
3 guides and parts of Title 10, and some of those are  
4 pretty gross. Like the description of job  
5 requirements that's in the tech specs, it goes back to  
6 the ANSI standard, I think, because it says -- it's  
7 almost like what do you need to be under the  
8 Constitution to be in the House of Representatives?  
9 You've got to be 21 years old and a resident for seven  
10 years. And so they are not very demanding standards.

11 The question is using the inspection  
12 procedures and all the policy statements and the  
13 regulations and the reg guides, the guidance that  
14 comes with the regulations, could you come to a  
15 conclusion that the safety culture was good or bad  
16 based on their relationship, the regulations  
17 relationship to the attributes? And the answer is  
18 probably no. Is that correct or incorrect?

19 MR. TRIMBLE: Yes. And also our ROP  
20 process is performance driven to -- you also would  
21 have to -- you'd have to not only do this integration  
22 but you'd also have to see an accompaniment with  
23 performance issues.

24 MEMBER SIEBER: Well, the bigger question  
25 is, which gets back --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 MS. GOODMAN: You get back to this  
2 morning's issue where Tom Murley had, you know, do you  
3 have the performance first or the safety culture  
4 first? We're arguing which of those boxes comes  
5 first. In fact, I might argue that you might have  
6 either one.

7 CHAIRMAN APOSTOLAKIS: Or both.

8 MS. GOODMAN: Or both. They might be on  
9 top of each other.

10 CHAIRMAN APOSTOLAKIS: In a line.

11 MS. GOODMAN: And I think that we will  
12 within the Commission guidance and if we see  
13 necessary, I think we'll go to the Commission for  
14 further guidance. We'll review the ROP process. It's  
15 our intention to work within the ROP process, but I  
16 think what we did for this presentation made us take  
17 a look at could somebody, could an inspector pull all  
18 these pieces together or do we have the pieces all  
19 over the place? So it would be kind of a very  
20 difficult task for the inspector to pull them all  
21 together. And that's one thin we accomplished and you  
22 made us accomplish, I guess, by doing this  
23 presentation, and maybe that's a first step and we've  
24 got some other steps to go.

25 CHAIRMAN APOSTOLAKIS: Do you plan to send

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 a SECY to the Commission on this?

2 MS. GOODMAN: At the moment --

3 MR. TRIMBLE: Well, our thoughts are what  
4 we want to do is to be very clear to make sure we're  
5 communicating well with the Commission as to -- if we  
6 decide to get back in this area, we want to make sure  
7 that the Commission is in agreement with that. That  
8 may translate to a Commission paper, it may not, but  
9 maybe communication can be done in some other way.  
10 But we definitely want to -- I think we see a need to  
11 at least talk to the Commission before we get -- you  
12 know, here at the earliest, at the onset, before we  
13 get rolling too far in any direction.

14 MEMBER ROSEN: Do you plan to come to the  
15 SERS' Human Factor Subcommittee and discuss what you  
16 have --

17 MS. GOODMAN: I think, yes. In fact --  
18 yes. I think that it would be very appropriate for us  
19 once we have got together a plan that we would come to  
20 a subcommittee or that we would come to the ACRS to  
21 discuss our plans, and hopefully we would do a joint  
22 office presentation.

23 CHAIRMAN APOSTOLAKIS: I don't want people  
24 to feel that we're giving more time to the staff than  
25 the guests, but --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER SIEBER: I have one short question.

2 CHAIRMAN APOSTOLAKIS: One short question.

3 MEMBER SIEBER: I think that it's  
4 important to remember George's first question, which  
5 is, is this all safety culture or is there something  
6 else, and I think there's two issues. There is a  
7 technical issue, and that issue is have we really  
8 thought about all the way these corrode and crack and  
9 otherwise fail and alert ourselves to look for that?  
10 The other issue is the culture issue that causes  
11 people to say, "I wonder why I'm changing all these  
12 filters all the time. I wonder why the leak rate went  
13 up," and those kinds of things.

14 CHAIRMAN APOSTOLAKIS: I think we are  
15 already in the discussions with Mr. Meyers.

16 MR. MEYERS: Nobody has said this yet: If  
17 you're going to look at what -- go back to the --  
18 after the event started that's one issue. But what  
19 allowed it to start? There was 9701 and we wrote you  
20 all safety evaluations from the owners group. Each  
21 owners group did that. The safety evaluation said  
22 that we would do head inspections, which you all  
23 endorsed. I still read that safety evaluation  
24 thinking it was a well written safety evaluation.

25 So we would go down and do head

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 inspections at every outage, we would have  
2 surveillance procedures in place to do those head  
3 inspections with and that we would look for one cubic  
4 inch of boron for criteria. And if we found one cubic  
5 inch of boron, that's what the safety evaluation gave  
6 you, I said, then we would do detailed engineering  
7 analysis of where it came from before we started back  
8 up.

9           You can look at the Davis Besse event and  
10 you could look at Davis Besse, period. The procedures  
11 that we had in place did not implement that safety  
12 evaluation. The owners groups did not make sure that  
13 we had procedures in place. The owners group wrote  
14 you the safety evaluation, the owners groups didn't  
15 make sure that each utility put in procedures and  
16 surveillance procedures that implemented that safety  
17 evaluation. And then when you all inspected it or  
18 INPO inspected it, you didn't call us to task either.  
19 So all of those failures are right there. If any of  
20 those failures had taken place so that we had  
21 surveillance procedures in place, inspections every  
22 outage and look for one cubic inch of boron, we  
23 wouldn't be sitting here today. Nobody's saying that,  
24 which were the failures.

25                           CHAIRMAN APOSTOLAKIS:           Which were

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 failures. I think it's time to move on, and we have  
2 the next presentation by Mr. George Felgate of INPO.

3 MR. FELGATE: Thank you. I appreciate the  
4 invitation to be part of the meeting today. I'm Vice  
5 President and Director of the Analysis Division at  
6 INPO. The Analysis Division at INPO is responsible  
7 for the analysis of all the plant-specific data that  
8 we use in preparing for our various interactions with  
9 our members. It's also the division that analyzes all  
10 the data that we use to detect emerging industry  
11 trends, and we manage the industry's operating  
12 experience exchange program.

13 As far as several had addressed why they  
14 thought they were here, well, INPO's name has come up  
15 a couple times, so that's a good reason to be here.  
16 But also I think it's totally appropriate. If there's  
17 a discussion about safety culture in the industry, I  
18 think INPO should be at the table, so I'm very --

19 MEMBER ROSEN: Will you pull the  
20 microphone a little closer?

21 MR. FELGATE: So I appreciate very much  
22 the opportunity to be here. Next slide, please -- or  
23 our first slide. That's good.

24 What I'm going to talk about briefly is  
25 INPO's perspective on safety culture, meaning how have

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 we approached looking at safety culture? We're going  
2 to talk about Davis Besse lessons learned. That's not  
3 the subject of the meeting, I realize, and I'm not  
4 going to go into all of the lessons learned. I'm just  
5 going to mention those that impact directly on safety  
6 culture. I'll mention briefly the significant  
7 operating experience report that we've issued, and  
8 that's been mentioned a couple times, and what we're  
9 doing with that. And then, finally, I'll discuss some  
10 of the actions that we have planned going forward.  
11 Next slide, please.

12 Just briefly, I draw your attention to the  
13 last bullet on this slide, which is safety culture or  
14 looking at safety has been an integral part of INPO's  
15 activities going back to its formation. The Camity  
16 Commission said there needed to be at the time of  
17 Three Mile Island a dramatic change in the industry's  
18 attitude towards safety, and the INPO, of course, was  
19 the industry's response to the Commission, to the  
20 Camity Commission. Next slide, please.

21 This is INPO's mission, and, as you can  
22 see, it is to promote the highest levels of safety and  
23 reliability. So safety again appears prominently in  
24 our mission. It's really in our fabric of what we do  
25 at INPO.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER ROSEN: And the word there is  
2 "excellence," which implies rising standards of  
3 performance.

4 MR. FELGATE: That's correct. The  
5 discussion we just had about ratcheting, we do  
6 ratchet, and we do it openly and willingly and with  
7 our members --

8 MEMBER ROSEN: Without apology.

9 MR. FELGATE: That's right.

10 MEMBER ROSEN: Now, the staff has a  
11 different problem for a regulatory agency.

12 MR. FELGATE: And understandably. That's  
13 part of the differences in our two organizations.

14 CHAIRMAN APOSTOLAKIS: There's no backfit  
15 rule.

16 MR. FELGATE: No backfit rule, that's  
17 right. Next slide, please.

18 MEMBER ROSEN: The rule is backfit at  
19 INPO.

20 MR. FELGATE: As I've mentioned, it is  
21 fundamental to INPO's mission, but we have not always  
22 -- our activities have not always used the term,  
23 "safety culture." We've often gone about our  
24 activities looking at safety and dealing with safety  
25 but using different terminology in some of our

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 interactions with our members. For example, safety  
2 focus or deep respect for the core or reactivity  
3 management. A lot of emphasis in the past by INPO on  
4 subjects like reactivity management. So while it's in  
5 our fabric, it's in everything we do at INPO, it's --  
6 the words, "safety culture," are not spoken perhaps as  
7 often as they should be.

8 MEMBER ROSEN: But they do show up, do  
9 they not --

10 MR. FELGATE: Oh, yes.

11 MEMBER ROSEN: -- in the performance  
12 objectives and criteria.

13 MR. FELGATE: The very first --

14 MEMBER ROSEN: The 1997 version at least  
15 was very unabashed. It has a section, in fact it's  
16 Section 1 --

17 MR. FELGATE: Right.

18 MEMBER ROSEN: -- and it's entitled not  
19 deep respect for the core, not reactivity management,  
20 not safety focus, it's entitled, "Safety Culture."

21 MR. FELGATE: Safety culture, that's  
22 right.

23 MEMBER ROSEN: So INPO has been there for  
24 at least six years.

25 MR. FELGATE: But someone looking -- I

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 guess my point is someone looking at just what's  
2 printed on paper would get the impression that it's  
3 one of many things whereas my point is it's really  
4 embedded in a lot of what we do.

5 MEMBER ROSEN: But I just want to be very  
6 clear that I'm making the point, and you're confirming  
7 it, that INPO has had that focus with those words in  
8 its performance objectives and criteria, which is like  
9 the Bible for the beginning of the evaluation process.

10 MR. FELGATE: That's right.

11 MEMBER ROSEN: Since 1997.

12 MR. FELGATE: That's correct. Next slide,  
13 please. And I will answer the question that's on your  
14 lips there, Mr. Apostolakis.

15 Principles for enhancing professionalism  
16 of nuclear personnel was issued in the '80s, and as  
17 you can see, just an excerpt from that, it spoke to  
18 the nuclear professionals thoroughly and viewed with  
19 a great respect and sense of responsibility for the  
20 reactor core, for reactor safety, and all of his  
21 decisions and actions take this unique and grave  
22 responsibility into account. Another way, really, to  
23 define safety culture.

24 Our performance objectives and criteria,  
25 as Mr. Rosen has mentioned, says that individuals at

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 all levels of the organization consider nuclear safety  
2 as the overriding priority. In 1996, we had a CEO  
3 conference, and for those who don't know, the CEO  
4 conference gathers together all of the CEOs in a  
5 conference at one time once a year. The focus of that  
6 workshop was safety focus during changing times, and  
7 why we picked that theme at that time was deregulation  
8 and the forces of the increasing need to keep the  
9 units online, that the pressure to produce megawatts  
10 and the impact that might have on safety focus.

11 Starting also in 1996 we moved to cross-  
12 functional areas where we placed a greater emphasis on  
13 the organizational factors that could detract from  
14 sustained high levels of performance or could be  
15 tracked through safety culture.

16 And as already been mentioned by someone  
17 here this morning, the most recent CEO conference  
18 again focused on safety culture, building it and  
19 keeping it. It was a direct result of the Davis Besse  
20 event. We discussed the lessons learned as a group  
21 from Davis Besse, and we focused on actions to not let  
22 that occur again. Next slide, please.

23 So our approach over the years has been an  
24 overall look at plant performance, safety culture  
25 included, by a team of professionals that have broad

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 experience, many at the management level that are on  
2 our teams that visit the plant. Our philosophy has  
3 been if safety culture is unhealthy, it will show up  
4 in the symptoms that we look at, and I'll cover those  
5 symptoms which you could call attributes if you like  
6 or we've said they're symptoms of declining  
7 performance. Next slide, please.

8 Our definition of safety culture is just  
9 a little bit different. It's an abbreviated version,  
10 it's not out of line with the INSAG definition, it's  
11 similar to INSAG 4, but it is that set of attributes  
12 that results in nuclear safety being the overriding  
13 priority at the station, that set of attributes. It's  
14 very similar to what you'll read, as has already been  
15 mentioned in our performance objective dealing with  
16 safety culture.

17 So what do we look for? What are the  
18 symptoms that I'm referring to that we look for to see  
19 if safety culture is healthy? Every plant evaluation  
20 we look at operators in the simulator and implementing  
21 the emergency operating procedures. And it's not just  
22 can they successfully get through the procedure. It's  
23 what respect do they show for that procedure? When  
24 they come across something that is not quite written  
25 per procedure, what do they do? Do they proceed even

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1       though they may be a bit uncertain? How does the crew  
2       manage that kind of situation? Or do they blindly  
3       follow the procedure when they turn the switch or a  
4       dial and not really understand what might be happening  
5       outside the control room by turning that switch? So  
6       it's more than just seeing if they can make through  
7       the procedure satisfactorily.

8                 We look at any evolution that might be  
9       occurring on how operators -- any evolution that  
10      affects core reactivity. It might be something simple  
11      like a boration or a dilution, or it could be a more  
12      complex evolution. But we watch very carefully how  
13      that evolution is approached and with what care and  
14      caution that evolution is performed.

15                We take a look at where the problems are  
16      not reported or are allowed to linger -- leaks in the  
17      plant or deficient plant equipment. We do a pretty  
18      thorough inspection of the plant, and we identify any  
19      equipment deficiencies that we come across. We check  
20      to see that they're in the system, their system, for  
21      identification and resolution. If they're not, a good  
22      question is, well, why isn't it? Are there reasons  
23      that that deficiency hasn't been identified? Does it  
24      have something to do with the culture at the station,  
25      for example?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   Importantly, we watch a wide range of  
2                   activities, maintenance activities, operations  
3                   activities, and we take a look at do the operators or  
4                   the technicians stop when uncertain or facing  
5                   unexpected conditions? And over a two-week period  
6                   with a team of 50 or so people on site, you will run  
7                   across several evolutions where it doesn't quite go as  
8                   planned, and it's very telling how the organization  
9                   deals with that when they come across that situation.  
10                  Is there an attitude that says, "Oh, well, it's not  
11                  quite the way it's written in the procedure, but we've  
12                  done it this way before, and I know I can proceed."  
13                  Or do they stop, put the system in a safe condition,  
14                  contact the supervisor and approach it in a  
15                  conservative manner? It's very telling.

16                  MEMBER ROSEN: You skipped the fourth  
17                  bullet, and I'd really like to hear what you say about  
18                  that.

19                  MR. FELGATE: Oh, I skipped the -- safety  
20                  systems are unavailable longer than need be. They may  
21                  meet regulations. Their safety system unavailability  
22                  may even meet the 2005 goals as one of the performance  
23                  indicators, but if it's planned to be out of service,  
24                  online maintenance, let's say, it's planned to be out  
25                  of service for ten hours and it's out of service for

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 12 hours, why? Is the organization doing everything  
2 they can to ensure that operations and RP and  
3 maintenance are coordinated so it goes out of service  
4 promptly or crisply, let's use that word, and then  
5 when it's ready to be put back in service there are no  
6 inefficiencies associated? In other words, there's a  
7 respect or a recognition that that safety system, even  
8 though it may meet the rules, should be in service the  
9 absolute maximum amount of time possible. That's  
10 what's meant by that bullet. Next slide, please.

11 How risk is measured and managed. We look  
12 at the planning going into outages as well as the  
13 planning for online maintenance and how well the risk  
14 management of systems being taken out of service is  
15 handled by the station. We look at modifications that  
16 are installed. Do they adequately question the impact  
17 that's going to have on the margins? And it may be  
18 subtle things. It may be more than this -- just to  
19 give an example, power uprates have caused several  
20 consequential events recently in the industry but on  
21 the balance of plant side, not necessarily directly  
22 related to the power uprate scope itself. It may be  
23 that increased steam flow has caused an  
24 erosion/corrosion issue on the secondary side of the  
25 plant. Is the thinking of the plant broad enough to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 include that scope of impacts, unintended  
2 consequences, if you will, in equipment as well as  
3 extra challenges that might be posed on the operators  
4 in the control room. Somewhat subjective.

5 CHAIRMAN APOSTOLAKIS: When you say the  
6 plant whom do you mean, the management of the plant or  
7 everybody?

8 MR. FELGATE: Everybody, top to bottom.

9 CHAIRMAN APOSTOLAKIS: Top to bottom.

10 MR. FELGATE: Yes.

11 CHAIRMAN APOSTOLAKIS: So individual  
12 workers should have a good idea as to how what they're  
13 doing at the moment affects the big picture.

14 MR. FELGATE: That would be correct, yes.  
15 How comfortable is the plant staff with raising  
16 problems? We'll spend a great deal of time  
17 interviewing surveys, just spending time with the  
18 board operator in the control room. And after a few  
19 days with the board operator, there's a certain  
20 relationship that's established, because typically the  
21 people on our teams are board operators on another  
22 plant or SORs at another plant. And you'll see  
23 something deficient and you'll ask why is that item --  
24 have you raised that to your management? And if you  
25 get an answer like, "I've raised it three times but it

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 never gets taken care of," that's a culture issue, and  
2 it's a red flag to the team that there's something  
3 that needs to be addressed with the organization.

4 Now, that's not intended to be a complete  
5 list of the attributes, there's other things. We  
6 mentioned here in another presentations today the  
7 respect or the way operating experience is dealt with,  
8 the engagement by the management team. Do they  
9 actually go out and put their eyes on the problems in  
10 the plant themselves?

11 MEMBER KRESS: How many of these symptoms  
12 have to show up before you deem the safety culture to  
13 be not quite good enough?

14 MR. FELGATE: Actually, I'll answer that  
15 question now, next slide, because it's at the heart of  
16 the Davis Besse lessons learned. We identified a  
17 number of the organizational contributors that led to  
18 the -- that we've been talking about here off and on  
19 this morning that led to the problems that occurred at  
20 Davis Besse. We did not put it all together. We did  
21 not aggregate those organizational factors, and in  
22 doing so we did not send a compelling message to the  
23 leadership at First Energy at the time that there were  
24 degradations in safety culture, that if it wasn't  
25 going to be a head wastage problem, it was going to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 lead to a significant event somewhere in the Plant.

2 So just like the Agency, we have a lot to  
3 learn at INPO about not letting an event like that  
4 occur. And the next event won't be boric acid  
5 corrosion of a head, it will be something else dealing  
6 with -- and we want to avoid that, so we have much to  
7 learn. There are 14 recommendations for INPO coming  
8 out of that. I'm not going to cover those. The first  
9 two, though, are key to what we're talking about here,  
10 that we need to do a better job recognizing and more  
11 openly discussing with our members safety culture  
12 issues. Actually, getting to the point where when  
13 there is a set of organizational issues that are not  
14 working well, it raises the red flag, and we're very  
15 comfortable and the organization is very comfortable  
16 sitting down with us and having that dialogue about  
17 safety culture. But it's not a yes or a no; it's a  
18 continuum, and we need to have that dialogue without  
19 getting the defensiveness of the station up.

20 CHAIRMAN APOSTOLAKIS: I really like the  
21 argument you made because I was about to object with  
22 Tom's question, I mean why do I need to have an  
23 assessment of the whole culture, but then you said  
24 because that may lead to problems somewhere else.

25 MR. FELGATE: Yes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   CHAIRMAN APOSTOLAKIS: Which is a good  
2 point. But were there any symptoms other than those  
3 related to the head problem, the vessel head problem?

4                   MR. FELGATE: Oh, yes.

5                   CHAIRMAN APOSTOLAKIS: There were other  
6 symptoms.

7                   MR. FELGATE: Yes.

8                   CHAIRMAN APOSTOLAKIS: And those could  
9 have led to a problem?

10                  MR. FELGATE: Yes, and I don't think I'm  
11 speaking out of school, because these have discussed  
12 in fairly public forums, but things like not using  
13 operating experience effectively, which is generic.  
14 If it wasn't a head problem, it was going to bite the  
15 organization somewhere else. There wasn't sufficient  
16 rigor in the way engineering organization was  
17 approaching issues. We had concerns about the  
18 supervisors and how much time they spent actually  
19 coaching and observing.

20                  So as I said, if you list the actual  
21 organizational contributors that today in our 20/20  
22 hindsight we know caused or led to the event and then  
23 listed the ones that we identified at INPO, we've got  
24 probably more than half of them. But what we didn't  
25 do is we didn't aggregate that. We didn't say,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 "That's enough for us to be worried about," to send a  
2 strong message to First Energy senior management,  
3 "There's a worry here, and you need to be worried  
4 about it." That's where we need to be better. Next  
5 slide, please.

6 MEMBER ROSEN: Now, would you get better  
7 by tripping sooner, by being --

8 CHAIRMAN APOSTOLAKIS: Paying attention.

9 MEMBER ROSEN: -- more sensitive by  
10 risking having too many false positives?

11 MR. FELGATE: Well, there's a long list of  
12 things that we're doing to not get the -- actually not  
13 let a member down like we did in this case again. One  
14 is an entire -- the entire division that I had up has  
15 been strengthened to do better data analysis.

16 MEMBER ROSEN: Better what kind of  
17 analysis?

18 MR. FELGATE: Data analysis.

19 MEMBER ROSEN: Data.

20 MR. FELGATE: We've changed the evaluation  
21 process to place greater emphasis on organizational  
22 factors rather than on functional areas, maintenance  
23 engineering. We're looking at cross-cutting  
24 management leadership issues more aggressively. So  
25 there's a whole host of things that we're doing, and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 I'll mention a few more of them as we go along here.

2 MEMBER POWERS: Let me ask a question. I  
3 know you haven't explored all the things that you're  
4 doing, but why do you think that these kinds of things  
5 that you're doing are going to be effective and that  
6 you won't be in here 20 years from now saying, "Well,  
7 we aggregated everything together so badly that we  
8 couldn't find the specifics for the next event."

9 MR. FELGATE: I guess the only way I can  
10 answer that is by, just as you are doing, by getting  
11 the collective intelligence and wisdom of a lot of  
12 people together from the industry, from INPO, using  
13 the international documents and studies that have been  
14 done, doing a better job learning from what operating  
15 experience is telling us, to look for and putting  
16 greater focus -- the other thing I would say is  
17 putting greater focus on outliers. The industry  
18 record, I could show you curves of safety statistics  
19 and data that show the industry, but it's been said  
20 here that's all good and well, but if one plant has a  
21 safety-significant problem, we're going to be sitting  
22 here talking about it again.

23 So all I can say is that we think that we  
24 can learn from the experiences at Davis Besse and put  
25 things in place that will preclude being surprised by

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 that again.

2 MEMBER POWERS: I guess I'm just worried  
3 about the general's problem of fighting the last war.

4 MR. FELGATE: Yes. No. Well, our focus  
5 from the start is not to address this as try to  
6 prevent another boric acid event but to look at the  
7 organizational factors that lead to a decline in  
8 performance. And to the point you were making, we are  
9 seeing -- just to answer a question you raised  
10 earlier, I didn't grab the microphone then but we are  
11 identifying some indicators that correlate well with  
12 decline in performance. One is the -- just to give  
13 you an example, one is the sum of significant and  
14 noteworthy events. We get a lot of events, more than  
15 the Agency gets, and we categorize them in various  
16 categories. And we found a strong correlation in the  
17 sum of significant and noteworthy events to plants  
18 that have experienced in the past a safety-significant  
19 event or an extended period of shutdown.

20 We're now applying that to plants that are  
21 running fine who have that same trend in indicators  
22 and having a predictive, having a proactive  
23 communication with those plants, saying, look, we're  
24 not saying you're about to have a significant event  
25 tomorrow, but your indicators are trending in the same

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 direction and why? You ought to look at that, we  
2 ought to look at that together. We need to grow that  
3 set. We believe there are a set of predictive  
4 indicators that will correlate well and help us  
5 identify declining performance before it results in a  
6 significant event. Next slide.

7 I think -- just back up one if you would.  
8 Let me mention the SOER just a minute because it's  
9 come up several times in the discussion. We issued a  
10 significant operating experience report on the Davis  
11 Besse event. It is our top level operating experience  
12 document. We don't issue many of them, one or two a  
13 year. It contains recommendations that our teams,  
14 evaluation teams follow up with to make sure that they  
15 have been thoroughly implemented. That's what the key  
16 or unique about an SOER, significant operating  
17 experience report, is the recommendations that are  
18 followed up and not closed out until they are  
19 satisfactorily implemented by each station.

20 MEMBER SIEBER: Could you, just so I can  
21 complete my notes, tell me what the three  
22 recommendations are?

23 MR. FELGATE: I will, yes. It's on a  
24 later slide.

25 MEMBER SIEBER: Okay.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. FELGATE: This was our first red SOER  
2 since 1997, and red means urgent action required by  
3 our members. Next slide. And this SOER contains an  
4 event description, contains the causes and  
5 contributors we think that -- and we worked closely  
6 with the utility, in this case First Energy, to  
7 capture accurately those causes and contributors. And  
8 then it contains recommendations. Next slide, please.

9 In the case of Davis Besse, there were  
10 three recommendations. We asked every utility to  
11 conduct case study discussions with the entire  
12 management team, all the way down to first-line  
13 supervisors on the causes and contributors that led to  
14 the Davis Besse event and how they applied to that  
15 particular utility, and there was high-level  
16 involvement. At one utility, NMC, for example, the  
17 CEO personally facilitated those case study  
18 discussions. So that alone sends an important message  
19 to the organizations.

20 The second was to perform a self-  
21 assessment of safety culture at their stations, and we  
22 asked them to send us those self-assessments.

23 MEMBER ROSEN: Was this the document that  
24 Mr. --

25 MR. FELGATE: Yes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER ROSEN:       -- the fellow from  
2 Millstone was showing us?

3                   MR. FELGATE: Yes. He referred to it. I  
4 don't think he's in the room, but this is what  
5 required -- we asked each utility to perform a self-  
6 assessment of their own safety culture. And what's  
7 different, a little bit unique here for this SOER, is  
8 to send those results to INPO. We're going to use  
9 those and I'll show you how in just a minute.

10                  And, finally, the third recommendation was  
11 to identify and document any abnormal plant  
12 conditions, and every plant has them. You sort of  
13 live with them. You start the pump in this train, and  
14 it runs smoothly; you start the pump in this train,  
15 and the pipes shake a little bit and there's a little  
16 bit of a water hammer, but that's just the way this  
17 plant runs. We've asked them to get all those things  
18 on the table, identify why. Is there something more  
19 insidious about that that maybe isn't fully  
20 appreciated by the organization?

21                  Just to address Tom Murley's point, he  
22 said if you ask a utility to do a self-assessment of  
23 their own safety culture, of course it's going to come  
24 back okay if they've got a safety culture problem.  
25 All of the safety self-assessments I'm aware of are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 being done by teams from multiple utilities, and the  
2 safety check or the backstop, if you will, is that  
3 we're going to look at the quality of every one of  
4 those, and we're going to go back and if it's not a  
5 quality self-assessment, we're going to ask the  
6 utility to work on it further.

7 MEMBER POWERS: I am itching to point out  
8 that I know of at least one example of where an  
9 operating entity looked at its safety culture and said  
10 it didn't like what it saw.

11 MR. FELGATE: Right. I can tell you I've  
12 seen the first ten or so that have come in now to us,  
13 and they're quite candid.

14 MEMBER POWERS: I was very impressed with  
15 things that Duke has done when it saw declining human  
16 performance. It turned out everything it was doing  
17 fell in the world of safety culture, but they avoided  
18 using the word, "marvelous."

19 MR. FELGATE: Understand. Next slide,  
20 please. Just very briefly, since I know I'm running  
21 short on time, some of the actions that we have going  
22 forward. We put a task force in place at INPO to  
23 address safety culture just like you have. It's a  
24 high-level task force because it crosses all of our  
25 cornerstone activities. Fred Tollison chairs it, I'm

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 a member of it, we have an industry advisory group  
2 that's going to be working with us on it, and we're  
3 also getting international input. I'm aware of --  
4 someone asked earlier are there any utilities that are  
5 looking at safety culture indicators, and we know of  
6 two, EDF and OPG, that have actually developed safety  
7 culture indexes, and we want to get their intelligence  
8 and their input into this also.

9 MEMBER ROSEN: But didn't we hear that  
10 Millstone had done just that as well?

11 MR. FELGATE: Alan Price, yes.

12 MEMBER ROSEN: Yes.

13 MR. FELGATE: As I mentioned, the safety  
14 culture self-assessments are all coming into INPO, and  
15 we're going to review each one of those, not only for  
16 the purpose of quality control but we think all of the  
17 utilities telling us what they think are important  
18 attributes in the self-assessment they did of their  
19 safety culture, aggregating all that is going to be a  
20 tremendous important source of information on a good  
21 list of attributes that ought to alert us when a  
22 station is declining in safety culture.

23 MEMBER ROSEN: But, eureka. That is  
24 exactly what we have been asking to have done. Am I  
25 not right, George, that we would have a set of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 indicators for safety culture?

2 MR. FELGATE: Well, these will be  
3 attributes.

4 MEMBER ROSEN: Attributes. Which would  
5 then have indicators, presumably.

6 MR. FELGATE: Well, that's the next step.  
7 I didn't -- it's not on the slide, but --

8 MEMBER ROSEN: Well, to what degree can we  
9 work together on this thing?

10 CHAIRMAN APOSTOLAKIS: No.

11 MR. FELGATE: Well, actually, I was going  
12 to --

13 MEMBER ROSEN: Wait a minute. Before you  
14 say no let's just --

15 CHAIRMAN APOSTOLAKIS: I just said it.

16 MEMBER ROSEN: Okay.

17 (Laughter.)

18 MEMBER ROSEN: I said to what degree and  
19 you said no. Okay. You have given the zero answer.

20 MR. FELGATE: I will jump to the end here  
21 then and say that everyone else has addressed their  
22 input on rules, whether rulemaking is appropriate in  
23 this area. It's really not INPO's area of expertise,  
24 but let me offer that this strikes me as an area where  
25 INPO is particularly well suited because of the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 subjective nature of culture, because of the -- you're  
2 not talking about rules, you're talking about very  
3 fine intuition maybe even is a word that you can use  
4 that something isn't quite right in the organization  
5 that you want to bring to the management team's  
6 attention.

7 We think we're particularly suited, and I  
8 would suggest that perhaps the discussion we should  
9 have is to what extent can the NRC monitor INPO's  
10 activities in this area? What does INPO need to do?  
11 What additional sharing with the NRC does INPO need to  
12 do to give the Agency sufficient assurance that the  
13 industry is in a robust way addressing safety culture  
14 to the point of not allowing another surprise like  
15 Davis Besse to occur?

16 MEMBER LEITCH: George, can I --

17 CHAIRMAN APOSTOLAKIS: And I would say yes  
18 to that.

19 MEMBER ROSEN: You would say yes to that.

20 CHAIRMAN APOSTOLAKIS: I would say yes to  
21 that.

22 MEMBER LEITCH: Can I --

23 CHAIRMAN APOSTOLAKIS: Go ahead.

24 MEMBER LEITCH: -- give you some  
25 observations and get your reaction to them? Like you,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 my own personal feeling is the NRC has all the  
2 regulatory authority they need, and where they don't  
3 have absolute regulatory authority they have  
4 considerable influence that they can exert on the  
5 management of an organization, even extra regulatory  
6 authority. But yet Davis Besse happened and what can  
7 we do about that situation?

8 And in my mind, I go back -- and how can  
9 INPO help in that regard? In my mind, I go back to  
10 the very creation of INPO following the TMI accident,  
11 and we talked about in the year or two following that  
12 what we could do about operator training or training  
13 of nuclear plant personnel, in general, and whether  
14 the NRC should do that or exactly how we should  
15 proceed in that regard. And I think there are a lot  
16 of parallels between that situation and the situation  
17 we're dealing with now.

18 And what was finally agreed to, and I  
19 guess a high-level discussions took place between the  
20 NRC and INPO at that time, and basically that work was  
21 kind of subcontracted to INPO through the National  
22 Academy of Training. They accredit training programs.  
23 All the training programs are accredited every four  
24 years, there's a high-level panel where there's also  
25 an NRC member, I believe, sits on that panel. At

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 least that used to be the case, and I think it still  
2 is. And really I think over the 22 or so years since  
3 that's been in effect we have had a great deal of  
4 confidence in the health of the training programs.

5 I think there's been very good training  
6 programs, and they've continued to maintain their  
7 excellent status in the industry, and I think it's  
8 because of that accreditation process, which involves  
9 plant visits, it involves plant management going down  
10 and having to face this high-level panel, and we all  
11 know that if INPO doesn't fulfill their role in that  
12 to an excellent degree, the NRC is going to jump right  
13 in and do it for them, so to speak.

14 So I really think there's a lot of  
15 parallels there. In other words, it seems to me that  
16 a lot of this work could be given to INPO to watch,  
17 because I think INPO is better organizationally  
18 positioned to look at these things than is the NRC,  
19 because you have a mission -- your mission doesn't  
20 require the same objectivity that a regulator's  
21 mission requires. And I think maybe there could be  
22 some kind of a blue ribbon panel and senior plant  
23 management comes down that is after the plant  
24 evaluations and you've collected all the data, all the  
25 observations, that senior plant management comes down

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and faces this blue ribbon panel. In as much the same  
2 as we have to defend our training programs, we have to  
3 defend issues relating to safety culture.

4 MR. FELGATE: Yes. I don't know if I  
5 would -- I mean there's quite a bit of infrastructure,  
6 as you know, associated with the National Academy for  
7 Nuclear Training, and I'm not sure I'm sitting here  
8 suggesting that we go to that extent with safety  
9 culture. My point is just that because of the nature  
10 of the issue, I think we're better suited to look at  
11 organizational influences on safety culture than the  
12 NRC is. Not a reflection in any way on the NRC, it's  
13 just the nature of the issue.

14 And I think that there's obviously some  
15 need to observe then what we are doing to satisfy the  
16 Agency that we're doing that, the industry is doing  
17 that in a robust and thorough fashion.

18 MEMBER LEITCH: Well, my concern is you're  
19 responding to SOER -- you know, the industry is  
20 responding to SOER 0204, but to what extent is that  
21 going to be institutionalized? Or five years from  
22 now, will the industry still be looking for these  
23 long-standing problems? Will they still be bringing  
24 to the new operators the lessons learned at Davis  
25 Besse? There's going to be a lot of turnovers. In

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 other words, is this process going to be  
2 institutionalized somehow or is it INPO SOER 0204,  
3 they come in and do a plant evaluation, check off,  
4 okay, you've done all that, but what about the next  
5 plant evaluation and the next one?

6 MR. FELGATE: In fact, we have a process  
7 in place already for certain SOERs that are, based on  
8 our industry review groups and our own opinion at  
9 INPO, have ongoing importance to the industry. And  
10 this certainly would be in that category, our what we  
11 call select SOERs, and have an ongoing continuous  
12 implementation.

13 MEMBER ROSEN: Well, I think this is  
14 clearly that kind of select SOER, but Grant's point,  
15 seems to me, is right on with that idea that some sort  
16 of arrangement, a la the training arrangement but not  
17 with all the bells and whistles of the National  
18 Academy. But not to say that there wouldn't be some  
19 sort of formalities in the process but maybe not the  
20 same formalities or modalities that are with the  
21 Nuclear National Academy. But I think you're right on  
22 there --

23 MEMBER LEITCH: But couldn't we use that  
24 as some kind of a model for, hey, this is what how we  
25 dealt with some very serious issues right after TMI,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 and is this any less important?

2 MR. FELGATE: Yes. Again, I think what  
3 I'm discussing here is a concept. As far as the  
4 details of implementation, an organization that isn't  
5 here right now that would have to be very much  
6 involved in that is NEI.

7 MEMBER POWERS: I guess I'm perplexed, and  
8 as most of the members know that's bad when I'm  
9 perplexed, I guess.

10 MEMBER ROSEN: Bad for you, anyway.

11 MEMBER POWERS: Yes. I mean we've been  
12 discussing Davis Besse here and we've concluded that  
13 the operating institution at Davis Besse failed.  
14 Other people have explained to us how the NRC failed.  
15 And we've had an explanation of INPO failed. And then  
16 you're coming back and say, Oh, but INPO's the one to  
17 correct that." And I'm desperate to try to find out  
18 what evidence there is to suggest that INPO who failed  
19 just as much as the other institutions involved is in  
20 a position to correct itself effectively here? I mean  
21 what evidence is there -- I'm sure you're very  
22 confidence that your institution can, but don't you  
23 have to prove yourself first?

24 MR. FELGATE: I think that's well said.  
25 We'd have to prove ourselves.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER LEITCH:    Well, I think you're  
2                   organizationally positioned. The mission allows them  
3                   to be looking for excellence. This organization can  
4                   assure that there's never another event like Davis  
5                   Besse. I mean they can make an absolute iron clad  
6                   guarantee that it never happens again.

7                   CHAIRMAN APOSTOLAKIS:       Graham, you  
8                   mentioned TMI. As far as I know, there was a torrent  
9                   of regulatory actions after that, so I'm not sure what  
10                  the model you're talking about is. I mean it's true  
11                  that the industry responded, INPO was created and so  
12                  on, but I'm not sure that at any point the NRC said,  
13                  "Oh, now they have INPO, so we don't have to do this  
14                  A,B,C,D."

15                  MEMBER POWERS: Well, that's not correct.

16                  MEMBER LEITCH: Well, with respect to  
17                  training, I think that was the case.

18                  MEMBER ROSEN: Yes. With respect to  
19                  training there was that agreement, not with respect to  
20                  the torrent, the design changes and all that, with  
21                  respect to training of plant staff.

22                  CHAIRMAN APOSTOLAKIS: What kind of  
23                  oversight did the Agency have on that?

24                  MEMBER POWERS: They have a fellow on the  
25                  panel.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 CHAIRMAN APOSTOLAKIS: Sorry?

2 MEMBER POWERS: They have somebody --

3 CHAIRMAN APOSTOLAKIS: But, you see,  
4 training is different from this issue, because here it  
5 seems to me you have to have the trust of the utility  
6 management, and one of the hallmarks of INPO's  
7 operations, being that they do have that trust,  
8 because they're frank with them, but also your reports  
9 don't leak out. I mean they don't become public  
10 knowledge. And it seems to me if you want to be  
11 effective in issues like safety culture and you find  
12 something wrong, you do want to do that in a  
13 controlled environment and tell them frankly what you  
14 think without fearing that that will appear in the  
15 newspapers the next day.

16 MEMBER ROSEN: That is an issue. I think  
17 --

18 CHAIRMAN APOSTOLAKIS: But if you allow us  
19 in, well, I don't know.

20 MEMBER ROSEN: Well, our accreditation  
21 reports are also private, just like our evaluation  
22 reports are private.

23 MR. FELGATE: I guess what I would say in  
24 closing, and I won't go over the last -- you have the  
25 slides in your notebook -- is we're proceeding down

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 this path because it's fundamental to INPO's mission,  
2 it's fundamental to what our members expected INPO to  
3 do is to not allow another event that has the results  
4 in a plant to be -- that reflects a breakdown in  
5 safety culture or results in an extended shutdown  
6 period for a plant, to not let that happen again. I  
7 don't think it would be in the best interest of  
8 anyone, quite frankly, for there to be a lot of  
9 duplication of effort. We feel this is fundamental to  
10 our mission, and we're proceeding on the path that  
11 I've tried to outline here today. To the extent that  
12 the Agency can monitor and assess our effectiveness,  
13 I offer that as an opportunity.

14 CHAIRMAN APOSTOLAKIS: Thank you very  
15 much. I particularly like that slide where you said,  
16 you know, we're going to do this and this and that  
17 because we failed there. I'm wondering whether the  
18 NRC is going to do that at some point and say, "We're  
19 going to do a few things because we identified some  
20 weaknesses in the way we do things."

21 The next speaker is Mr. Meyers from First  
22 Energy Nuclear Operating Company. Mr. Meyers?

23 MR. MEYERS: Thank you.

24 MEMBER ROSEN: You need to tell us why you  
25 qualify to be here, a little bit about your

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 background.

2 (Laughter.)

3 MR. MEYERS: Let's go to the next slide.  
4 I'm Lew Meyers. I'm the Chief Operating Officer of  
5 First Energy Nuclear Operating Company, and for the  
6 last year I've been assigned to the Davis Besse  
7 station for the return to service of that station.  
8 From a safety culture standpoint and a return to  
9 service, I tell everyone now that since I've been over  
10 there I sleep like a baby -- I wake up every two hours  
11 and cry.

12 (Laughter.)

13 To give you a historical perspective of  
14 the Plant and how we got here, and I am proud to be  
15 here today, I talk about the safety culture model that  
16 we have in place and then the safety culture  
17 improvements we've put in place. Today, I listened  
18 and I came with a presentation. After listening to  
19 Charles Dugger, there were some things that I agreed  
20 with and disagreed with, some things that Howard  
21 Whitcomb said that I agreed with and disagreed with,  
22 and Alan Price and Clare Goodman. So I don't know  
23 exactly what I'm going to say now after I listened to  
24 all the other people talk. But first history.

25 You know, I mentioned 9701 --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 CHAIRMAN APOSTOLAKIS: But you will tell  
2 us where you agree and disagree.

3 MR. MEYERS: I will. I've got notes.  
4 First, 9701. You know, I think if we had implemented  
5 9701 properly, as we said in the safety analysis we  
6 submitted to you from the owners group, we would have  
7 found the leak very early and probably would not be  
8 sitting here today. I think if the owners group had  
9 come back and made sure that the utilities did what  
10 they said, we wouldn't be sitting here today. And all  
11 the various inspections could have kept us from  
12 sitting here today. So that's all history.

13 Now, we did have the event that was  
14 identified March 2002, and we wound up entering the  
15 350 process, and the FENOC return to service plan has  
16 seven building blocks that I'll show you. Those  
17 building blocks were designed using the experience of  
18 a lot of other plants that were shut down for extended  
19 outages to give us a comprehensive look at our plant  
20 and to ensure that when we bring the plant back that  
21 we've addressed issues for consistent long-term  
22 performance.

23 Let me show you the building blocks very  
24 quickly. The return to service plan has the seven  
25 building blocks to the reactor head resolution. We've

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 now cut a hole in our containment, repaired the  
2 containment, installed a new head, that building block  
3 supply is complete. In fact, the head's on, hooked  
4 up, and we've already pressurized the reactor up to  
5 250 pounds.

6 We went through each and every one of our  
7 programs that we identified. I think there were like  
8 45 programs. And we did a type one and type two  
9 program reviews. A type one program review was when  
10 we brought an independent group to really go through  
11 the program in detail and make sure that it met all  
12 the industry standards. A type two program was a  
13 program in which we did a review to make sure that it  
14 meets the regulatory requirements and we had good  
15 ownership, and that's comprehensive. And we went  
16 through those programs in good detail. That building  
17 block is basically complete.

18 The containment health building block has  
19 been enormous. We've installed new -- we painted our  
20 dome. About an acre of paint we had to scrape of our  
21 dome. We've identified issues in our containment,  
22 we've replaced the containment sump strainer, if you  
23 will. Now we believe we have the most robust strainer  
24 in the industry. And we've taken a lot of other  
25 actions in our containment. And if you went in our

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 containment today, we've rebuilt all of our  
2 containment air coolers, I mean they're new. The  
3 coolers are new. That was a huge, huge job. The  
4 ventilation duct work that goes into those coolers is  
5 new, stainless steel -- huge job. So there's been a  
6 lot of progress there. That building block we should  
7 be closing that out on the 20th of this month, so  
8 we're looking forward to getting out of the  
9 containment. What that means is we'll be handing off  
10 to Operations, and we'll put the missile shields doors  
11 back on containment. We've already pressurized the  
12 containment and done an integrated leak rate test  
13 also.

14 From a system health standpoint, we've  
15 gone down all of our systems. We've looked for signs  
16 of degradation, we looked for compliance with the  
17 codes, we looked for boron leaks, and we qualified  
18 people to look for boron leaks, so it wasn't just a  
19 bunch of operators go out there and look for boron  
20 leaks. We sent them through a training program that  
21 we developed ourselves to look for boric acid. So we  
22 think that was effective.

23 The next building block that we have is  
24 the restart test plan. That's the plan that we have  
25 in place where we will start the -- we will heat the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 plant up using pump heat and prove that all the work  
2 that we've done is in good stead. That's an industry  
3 lesson learned, if you will, for plants that start-up  
4 and then have a lot of problems. We're going to try  
5 to flush all those problems out prior to restart, and  
6 so our intention is to heat the plant up. We've  
7 already ran the reactor coolant pumps for a couple  
8 hours each. We're doing the 250-pound test, but we  
9 want to go up to near about 2,250 pounds normal  
10 operating pressure and as close as we can get to  
11 normal operating temperature, check out all of our  
12 equipment that's not run the last year, condensate  
13 pumps, feed pumps, and then stay there for seven days.

14           And then we come back down then it's our  
15 intention to do a bottom head inspection at that time.  
16 But we've done a very thorough mapping of our bottom  
17 head, of our reactor. We did not have a permanent  
18 cavity seal, we do now in the containment, and so  
19 we've installed that this outage. We've cleaned the  
20 bottom head in great detail, so we're going up and  
21 stay for seven days. We've had Framatome do some  
22 analysis which we presented to the NRC. We know after  
23 seven days we can detect ten to the minus fourth  
24 leaks.

25           We've also installed a new fleece monitor

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 on the bottom head. I think it's one of a kind. It's  
2 a detecting system using a solid state detectors. It  
3 looks for humidity and will detect -- and we're going  
4 to test that during that heat-up to prove it. We're  
5 going to inject small amounts of vapor into the  
6 system, and we believe that that system will detect  
7 ten to the minus fourth, I think it is, gallons per  
8 minute leakage, very small amounts of leakage in one  
9 of the reactors if we ever were to have a bottom head  
10 leak. We're the first plant in the United States to  
11 install that system. I think it buys us a lot of  
12 margin. It's used in Europe by 12 plants, and it's  
13 been performed well at those plants, so we're excited  
14 about that.

15 So we'll finish the restart test plan and  
16 that gets the Plant back online. Prior to that, and  
17 ongoing and even after the restart, there's a  
18 management human performance excellence plan that we  
19 have in place. All of that feeds into the restart  
20 action plan. And then we create an independent panel  
21 of what we think are industry experts, and they're  
22 really independent. Most of you all would know some  
23 of the people on there. That panel provides feedback  
24 to us on other things we should look at, and their  
25 charter has them to agree with us that -- not justify

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 why we should restart but that we should restart. And  
2 there's a difference there.

3 CHAIRMAN APOSTOLAKIS: Wasn't there a  
4 Safety Review Board in place before the incident?

5 MR. MEYERS: The Nuclear Oversight --

6 CHAIRMAN APOSTOLAKIS: Yes.

7 MR. MEYERS: Yes, sir.

8 MEMBER ROSEN: CNRV.

9 MR. MEYERS: CNRV.

10 CHAIRMAN APOSTOLAKIS: Aren't they  
11 supposed to be independent?

12 MR. MEYERS: Yes.

13 CHAIRMAN APOSTOLAKIS: So what --  
14 obviously, they didn't warn the management that  
15 something was wrong.

16 MR. MEYERS: If you go back and look --

17 CHAIRMAN APOSTOLAKIS: So why is this new  
18 panel going to be independent?

19 MR. MEYERS: If you go back and you look  
20 at that Nuclear Safety Review Board, this one's at a  
21 higher level for one thing. They have the right --

22 CHAIRMAN APOSTOLAKIS: So independence  
23 rises as --

24 MR. MEYERS: They have the right to say  
25 yes or no to restart. But the independent Nuclear

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Safety Review Board we would tell you that would be  
2 one of the things that failed at the Davis Besse  
3 Plant. They did look at the potential head leakage  
4 with the data they had. They made decisions that  
5 probably for the sake of evaluations were okay. So  
6 would tell you that group did not serve their function  
7 for this particular issue. So we've done some things  
8 in that area also.

9 CHAIRMAN APOSTOLAKIS: Okay.

10 MR. MEYERS: Which is in the human  
11 performance area, okay?

12 CHAIRMAN APOSTOLAKIS: Good.

13 MR. MEYERS: In fact, some of the new  
14 charter -- new ways of looking at things now they will  
15 be involved during outages. We bring them in  
16 routinely to help us look at things where they only  
17 meeting once a quarter or something and a couple days  
18 at the Plant. We're integrating them at various parts  
19 now, so there's a new way of business now with that  
20 group. Okay.

21 From a historical perspective also, in  
22 August we gave you the root cause report on the  
23 reactor vessel head. What we would tell you there is  
24 that -- let's see if I can do this correctly -- is the  
25 production focused established by the management,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 combined with taking minimal actions to meet  
2 regulatory requirements result in acceptance of  
3 degradation. In short, industry experience, lack of  
4 industry experience and lack of technical questioning  
5 and attitude by the management.

6 We'll go back and look at the history of  
7 Davis Besse. In a few moments, we'll talk about a  
8 safety culture model which is much like the Dominion  
9 model. We found that our employees identified  
10 problems. In fact, they're not afraid to identify  
11 problems. Ninety-five percent of our employees say  
12 they'd write a CR in a second, and at this time they  
13 compliment us on our ombudsman program we have, so we  
14 get fairly good marks there.

15 However, when those programs were  
16 identified in our corrective action program, there  
17 were 29 CRs written, not that I know this or anything,  
18 but the CRs were kept at a very low level and  
19 basically given to organizations and thrown away. So  
20 we did not raise the CRs to the right level, we did  
21 not root causes like we should have, and those were  
22 management issues. So if you go look at the building  
23 blocks of policy level decisions, management level  
24 commitment and employee level commitment, the top two  
25 are the ones we would focus on the most for the return

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 to service or Davis Besse.

2 Some of the attributes that we found by  
3 the management and human performance root cause -- if  
4 you go look at our management intrusiveness, technical  
5 questioning was not there, involvement was not there.  
6 The chief operating officer of FENOC was in the  
7 containment for the last refueling outage more than  
8 most of the managers. He went into containment one  
9 time. That's probably not the top of management that  
10 the gentleman from Millstone described today or that  
11 I would be accustomed to. So the technical  
12 questioning and the involvement of Management was  
13 somehow limited.

14 Isolationism was experienced throughout  
15 the Plant, not only isolationism to the industry but  
16 between group. We talked about that today. You know,  
17 the team work was missing. Operations had a hands-off  
18 attitude. They became sort of bus drivers. They  
19 would run the equipment. When building determinations  
20 were made, the engineers were just called over. They  
21 then came over, convinced their shift supervisor that  
22 their operability determination was correct and  
23 explained why, sort of a hands off attitude. So there  
24 was isolationism to the industry, isolationism between  
25 groups.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           The corrective action program was not  
2 implemented properly, as I said. At our other plants,  
3 we review every CR in the morning meetings, every day  
4 to make sure that they're properly classified. Didn't  
5 happen at Davis Besse. I'll give you another good  
6 example. At our Davis Besse Plant, we thought we had  
7 exactly the same corrective action program at all  
8 three of our sites. At our other two sites, which  
9 I've worked at, an operability issue is called an  
10 operability determination. The engineers go off, they  
11 do an evaluation, they come back and they explain to  
12 the shift supervisor why that evaluation's okay. At  
13 the Davis Besse Plant, that same issue was called  
14 operability justification. So we told the engineers  
15 right up-front what we wanted them to do to justify  
16 it.

17           Root cause like rigor. Operability  
18 evaluations were narrowly focused, operations  
19 leadership was focused only on operating the Plant,  
20 material condition issues were not resolved, silo  
21 mentality between plant work groups and then written  
22 policies did not support strong safety focus. We  
23 found that to be true in the management human  
24 performance report, all those issues.

25           In August of -- if you need to understand

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 our safety culture, in August 2002, we set out to  
2 understand that so we did the safety conscious work  
3 environment survey that the industry uses. We got  
4 some surprises there. What we found was there's  
5 reports in place from years ago that there was a clay  
6 layer building between management and the employees.  
7 The solution to that was not to do anymore surveys, so  
8 that probably didn't solve that problem.

9 January 2003, we developed a FENOC safety  
10 culture model, which I'll show you in a moment. And  
11 January of 2003, we did an independent review at Davis  
12 Besse that was conducted by Ms. Haber and her group,  
13 Human Performance Analysis Corporation. That was a --  
14 but that evaluation was very much in line with what we  
15 thought to be true. We think that wound up being a  
16 very good product for us. March of 2003, the employee  
17 safety conscious work environment survey was performed  
18 again, and we showed about a ten point improvement in  
19 our all areas, so we were happy with that.

20 Let me share our definition of safety  
21 culture, next slide. This data symbol, you have  
22 characteristics and attitude. Attitudes in the  
23 organization and in individuals which establish an  
24 overriding priority toward nuclear safety activities  
25 and that these activities receive the attention

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 warranted by their significance.

2 Now has everybody seen that definition two  
3 or three times today? No, you haven't. There's some  
4 key words that are different. Well, we also say "and"  
5 -- and overriding priority towards nuclear safety, and  
6 we changed it a little bit. Very similar. And that  
7 issues receive the attention warranted by their  
8 significance. That means management involvement,  
9 okay? So, you know, that's our definition. It's very  
10 similar. We have modified it slightly.

11 CHAIRMAN APOSTOLAKIS: You should use Word  
12 to --

13 MR. MEYERS: Excuse me?

14 CHAIRMAN APOSTOLAKIS: You should use Word  
15 to underline the differences from the inside  
16 definition.

17 MR. MEYERS: Okay. The word, "and,"  
18 establishes and. And's different. They have some  
19 commas and stuff there in the other one. "Towards  
20 nuclear safety" is a difference, so the word,  
21 "towards." Activities versus issues -- "and that  
22 these issues," so there's a few key word differences  
23 there. And that's about it. Other than that, it's  
24 the same definition. So we defined safety conscious  
25 work environment as that part of our safety culture

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 addressing employees' willingness to raise safety  
2 concerns and management's response to these concerns.  
3 The gentlemen from Millstone today he said it  
4 eloquently. It doesn't matter what the concern is, we  
5 need to take them seriously. Everybody's concern is  
6 a serious concern to them, and how we address those  
7 and respond to those concerns is extremely important  
8 to gain trust of our employees.

9 MEMBER LEITCH: Lew, did I understand you  
10 to say that your evaluation came up ten points?

11 MR. MEYERS: Pretty much across the board,  
12 yes.

13 MEMBER LEITCH: And what time frame was  
14 that?

15 MR. MEYERS: Well, the last one we did I  
16 think was in August. I'm sorry, it was --

17 CHAIRMAN APOSTOLAKIS: March.

18 MR. MEYERS: -- March, yes.

19 MEMBER LEITCH: And the previous one was?

20 MR. MEYERS: I think safety conscious work  
21 environment, so August of last year.

22 MEMBER LEITCH: So they're both after the  
23 problem.

24 MR. MEYERS: Yes. Yes. We wanted to  
25 benchline, take a measurement and then we'll probably

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 take another measurement in the fourth quarter this  
2 year, see how we're doing. So surveying our employees  
3 really --

4 CHAIRMAN APOSTOLAKIS: What is this ten  
5 you mentioned?

6 MR. MEYERS: Excuse me?

7 CHAIRMAN APOSTOLAKIS: You said ten. Ten  
8 what?

9 MR. MEYERS: If you go look across the  
10 board and you say, you know, how did we improve, we  
11 saw a pretty good step change, and it was like 35  
12 questions that we asked and a ten percent improvement  
13 across the board --

14 CHAIRMAN APOSTOLAKIS: Okay. Okay.

15 MR. MEYERS: -- from the questions that we  
16 asked.

17 MEMBER LEITCH: I'll ask this question of  
18 some of you later but in that time frame between those  
19 two evaluations, I read an article in the Toledo Blade  
20 or something like that where I guess it was the CEO or  
21 someone at that level said, "If we don't get this  
22 plant back online soon, we're going to shut it down."  
23 Do you think that had any influence on the answers to  
24 those questions?

25 MR. MEYERS: No, I don't. In fact, that

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 was way before that. But, you know, go look at the  
2 questions we asked. They're asked in a way where  
3 you'd have to ask -- there's correlations between  
4 questions, these three questions are correlated, and  
5 you've have to get them all right. So we looked for  
6 little deviations also, and we did find some  
7 deviations but I don't know what they were at this  
8 time. But we looked for that correlation, as a matter  
9 of fact. But we asked a similar question three  
10 different ways.

11 If you go look at the FENOC safety culture  
12 model, it's very similar to what we looked at today.  
13 Policy-level commitment is a corporate thing, and it  
14 may be true that we have all the policies in place and  
15 the policy statements to address safety culture. And  
16 to be honest with you, we found that we thought we had  
17 all that stuff but, you know, it wasn't nearly as  
18 clean as we thought it was or well understand. In  
19 fact, if you go look at our Davis Besse Plant, the  
20 management value structure, when we got over there we  
21 found -- when I got over there I found that the FENOC  
22 values were not being used at Davis Besse, neither was  
23 the FENOC mission of vision. They had their own.

24 CHAIRMAN APOSTOLAKIS: So it's not really  
25 charts like these that are important, it's how you

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 implement these things.

2 MR. MEYERS: That's right. It's the --  
3 I'll show you some more in a minute.

4 CHAIRMAN APOSTOLAKIS: Yes.

5 MR. MEYERS: From a plant management  
6 standpoint, a management-level commitment, that's the  
7 commitments that the local management have to safety  
8 culture, and the attributes that we monitor are over  
9 on the -- the commitments that we monitor are on the  
10 left hand side, and then the individual-level  
11 commitment areas and then those areas that they would  
12 monitor on the right hand side there. Let me go to  
13 the next slide.

14 MEMBER ROSEN: What's the significance of  
15 the colors?

16 CHAIRMAN APOSTOLAKIS: The colors, what do  
17 the colors mean?

18 MR. MEYERS: Well, in our last assessment  
19 -- in our first assessment we graded ourselves higher  
20 than we did in our last assessment, but we still  
21 believe that we've made improvements. But if you ask  
22 us right now how we would grade ourselves today as we  
23 sit here in each of these areas, before we make a mode  
24 change or a change to load fuel or any significant  
25 milestone at the Plant, we sit down and so an

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 assessment. Now, you notice I'm not using the word,  
2 "monitoring," I'm using the word, "assessment." We  
3 did an assessment of what we think our safety culture  
4 is there and are we ready to move forward based on  
5 that assessment.

6 And that assessment takes about four days  
7 and involves every manager and a lot of the employees  
8 at the Plant. So we bring the employees in and we  
9 talk to them about management observations at random,  
10 and we go through each and every department and we  
11 have a group of questions. And I'll give you an  
12 example of some of those questions. I've got a  
13 procedure back here that we use, but just for example,  
14 you know, if you go look at criteria related to  
15 questioning attitude under the individual commitment  
16 area, we may have five sheets like this where we have  
17 quality of pre-job briefing, and the team has to come  
18 in and grade how well that group is doing pre-job  
19 briefings. So we have specific criteria, and we do  
20 that for each and every group, so every group has to  
21 come in. And this is only one page of probably 50  
22 pages you've got to understand. It's not 50 but I  
23 think it's 40 pages or something.

24 So they have to go through all this  
25 criteria. The percent of CRs per group, and they have

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 to grade themselves on how many people are writing CRs  
2 in their groups. And if they're not identifying  
3 problems, you know, no one in their group is  
4 identifying any problems over a quarter, that's  
5 probably a problem, right? The number of programmatic  
6 CRs, programs and process error rates we look at and  
7 then raising problems, look at the management  
8 observation program there. And so we have a group of  
9 questions and each group has to come in and present  
10 that to the total team.

11 We also have a quality oversight  
12 perspective where they come in and give their  
13 perspective on that assessment. And then the team  
14 gives feedback to the group. And many times when the  
15 group comes in they'll be green and when they leave  
16 they're red. So it's like a four-day process that  
17 we've used each and every time we've made a change to  
18 ensure that not why we should go forward but that we  
19 are ready to go forward.

20 CHAIRMAN APOSTOLAKIS: I'm not perplexed  
21 but maybe puzzled --

22 MR. MEYERS: Yes.

23 CHAIRMAN APOSTOLAKIS: -- by the first  
24 one, quality of pre-job briefs. How does that differ  
25 from yellow? It's exactly the same words.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. MEYERS: In the red one there's a  
2 "not."

3 CHAIRMAN APOSTOLAKIS: What is the "not?"

4 MR. MEYERS: Are not acceptable.

5 CHAIRMAN APOSTOLAKIS: Are not acceptable.

6 Oh, okay. You see the significance of one little  
7 word.

8 MR. MEYERS: Yes. "Not" makes a  
9 difference; it's a big word.

10 CHAIRMAN APOSTOLAKIS: So with some  
11 exceptions is different from in general, right?

12 MR. MEYERS: Right. So some of these  
13 things are subjective and some are not. Some are very  
14 objective. So there's a lot of subjective questions,  
15 a lot of very especially very objective questions,  
16 like number of work orders in the backlog, number of  
17 late PMS. That's all here too in these questions.

18 CHAIRMAN APOSTOLAKIS: So if I say the  
19 observations -- the procedures in general are  
20 acceptable, that's different from the procedures are  
21 acceptable with some exceptions.

22 MR. MEYERS: Right.

23 CHAIRMAN APOSTOLAKIS: What is the  
24 difference?

25 MR. MEYERS: Well, we have criteria on

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1       there.

2                   CHAIRMAN APOSTOLAKIS:     Oh, you have  
3       criteria, okay. Okay. This is not the only guidance.

4                   MR. MEYERS:    No.

5                   CHAIRMAN APOSTOLAKIS:    In fact, this is  
6       not guidance at all, this is just what yellow, red,  
7       white and green are.

8                   MR. MEYERS:    Right, what we would discuss.

9                   MEMBER LEITCH:   What, if any, role does  
10       INPO have in this process? Is there a point at which  
11       INPO comes and does another evaluation and says, "Okay  
12       to go."

13                   MR. MEYERS:    To be real honest with you,  
14       we've asked INPO on several occasions already just to  
15       have management -- we've had blue ribbon committees in  
16       there, we had an INPO assessment last week, an  
17       industry assessment of our ETAP program that we're  
18       putting in place. ETAP's an electrical distribution  
19       program. We found that the model was somewhat out of  
20       date so we've upgraded the model. So we brought some  
21       people in from Duke and other utilities and an INPO  
22       person. And so if you look just about on a weekly  
23       basis, there's some kind of industry group at our  
24       Plant doing some assessment.

25                   MEMBER LEITCH:   That's a special visit in

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 some particular area. I guess my question really is,  
2 is there an overall time at which INPO comes in, looks  
3 at the whole process and says, "We agree, and it's  
4 okay to go."

5 MR. MEYERS: No.

6 MEMBER LEITCH: They're not in the loop as  
7 far as that's concerned.

8 MR. MEYERS: And what we do have is on the  
9 Restart Oversight Panel we have an INPO person on that  
10 Panel.

11 CHAIRMAN APOSTOLAKIS: One of the things  
12 that this brings up, which is a concern of mine  
13 regarding most of what is being said and written about  
14 in this field, is that in some instances we focus too  
15 much on numbers and this process doesn't seem to be  
16 risk informed. For example, I don't care that they  
17 had X process errors. It's the one error that is  
18 really risk-significant that worries me.

19 MR. MEYERS: You'll find that there's some  
20 questions about significant CRs too. I've got 20, 30  
21 copies of the procedure back there with me.

22 CHAIRMAN APOSTOLAKIS: Yes.

23 MR. MEYERS: I'll give it to you to day if  
24 you want.

25 CHAIRMAN APOSTOLAKIS: All 20 copies to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 me?

2 MR. MEYERS: No, I'll give you one.

3 CHAIRMAN APOSTOLAKIS: Oh, just one.

4 MR. MEYERS: This is only one sheet out of  
5 the whole procedure. It gives you some examples.

6 CHAIRMAN APOSTOLAKIS: But isn't it true,  
7 though, maybe this is part of -- a lot of this stuff  
8 doesn't appear to be risk informed. I mean the  
9 significance of what is being done doesn't appear to  
10 be a factor, so many complaints, so many this, so many  
11 that.

12 CHAIRMAN BONACA: But the number of error  
13 sis important because you don't know which ones are  
14 going to be significant or not.

15 CHAIRMAN APOSTOLAKIS: But I'm worried  
16 about the single error that is really lethal.

17 CHAIRMAN BONACA: I understand that but --

18 MEMBER POWERS: George, you're a POA  
19 person. You know that very, very seldom is a single  
20 error lethal, that most times it's a combination of  
21 things.

22 CHAIRMAN APOSTOLAKIS: But even in that  
23 context, though, not all errors are equivalent.

24 MEMBER POWERS: I understand that.

25 CHAIRMAN APOSTOLAKIS: Cognitive errors

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 are much worse than simple lapses.

2 MR. MEYERS: We would call that a  
3 significant division of quality --

4 CHAIRMAN APOSTOLAKIS: Yes.

5 MR. MEYERS: -- in our CR process, and  
6 that would be reviewed as part of this. Any  
7 significant --

8 CHAIRMAN APOSTOLAKIS: That's good.  
9 That's good.

10 MR. MEYERS: Okay. And let me give you  
11 very quickly some of -- because George used all my  
12 time up -- some of the actions we've taken.

13 MEMBER POWERS: That's very bad form.  
14 That never happens on this Committee.

15 CHAIRMAN APOSTOLAKIS: Go, Lew, go.

16 MR. MEYERS: Okay. From a policy-level  
17 commitment, the Board of Directors passed a resolution  
18 on nuclear safety. We do not have that straight from  
19 our Board. We established a policy on nuclear safety  
20 culture. That policy didn't exist before. We sort of  
21 had it laid out some places but it wasn't clear. We  
22 have a specific policy on nuclear safety -- on safety  
23 culture now.

24 We created a Chief Operating Officer  
25 position. We were looking at that person. Our

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 corporate organization was more of a virtual  
2 organization. We actually only had the CEO, our Chief  
3 Operating Officer, at corporate, the President of  
4 FENOC. So now we've created a person that all the VPs  
5 report to that ensures that we're doing things the  
6 same at all of our plants. That's my job now, so as  
7 soon as I get through the Davis Besse event, I'll try  
8 to go do that. And we created an Executive Vice  
9 President of Nuclear Engineering. We brought Gary  
10 Leidich back and he's in that area now. So we've also  
11 elevated and got our engineering more consistent  
12 across our sites.

13 We established a FENOC corporate  
14 organization structure. We took our critical programs  
15 that we looked at when we did the program reviews, and  
16 we've created a whole organization, our 16 floor now,  
17 of program owners. The purpose of those program  
18 owners is to make that the programs are good quality,  
19 that they're being implemented consistently and they  
20 meet the regulatory requirements. So there's probably  
21 20 people in corporate now that we didn't have before.  
22 So we don't have an isolation type case like we found  
23 at our Davis Besse Plant where they had different  
24 visions, missions, everything else. And in fact they  
25 were still wearing Toledo Edison hard hats over there,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1       rather than our FENOC hard hats.

2                       We implemented an executive level quality  
3 assurance position. Quality assurance, if you go back  
4 and look at the way we used to do business, reported  
5 to the site VPs. And if you go read the -- you know,  
6 you talked about that INPO gave you some ideas about  
7 some of the things they had found in the past. If you  
8 go read our quality assurance reports that we had done  
9 at our plant and read the report and look at the  
10 conclusions that were drawn at the end, they're not  
11 consistent with the material in the report. And we've  
12 eliminated that now. That quality is independent.  
13 They not only report up to the Chief Operating Officer  
14 and the Site VP, they report to the Board. They give  
15 a presentation to the Nuclear Subcommittee of the  
16 Board once a month. So they actually report to our  
17 Board.

18                      We strengthened the employee concerns  
19 program. We established a safety conscious work  
20 environment policy. Once again, that's focusing on  
21 people and people's right, listening to what people  
22 have to say. We enhanced the FENOC values, mission  
23 and vision statements, went back and revisited all  
24 that. From a management level area, we went back and  
25 looked back at the senior management team and we said

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 we want people that are dedicated to excellence, that  
2 inspire trust and believe in employee development.  
3 I'll tell you why. If you look back at the '94 time  
4 frame, we had specific things, like we had an operator  
5 pipeline program for developing managers. That got  
6 decreased to a certification program, and then it went  
7 away all together at Davis Besse. So over time you  
8 can see that degradation from '94 to when we did our  
9 root cause report.

10 So we've appointed a new senior team, and  
11 that senior team we think has the attributes that I  
12 discussed. We've also went down to the next level and  
13 we're still working on finalizing some of the  
14 management team. We're looking for people that have  
15 similar attributes, they've involved in field work,  
16 what I call intrusive management, and I think that if  
17 you go look at our management team below the senior  
18 team now, they're pretty solid citizens. We've got  
19 three more jobs we're going to fill, and they'll be  
20 very solid then. And so we're finishing up in that  
21 area now.

22 We've established the management  
23 observation ties to plant risk. Now, what does that  
24 mean? At our other two plants we had a procedure  
25 where every day we look at all the jobs we're doing,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and we do a risk significance of those jobs. And what  
2 we do is for medium risk it requires management  
3 review, and for high-level risk it requires director  
4 review at the level below me. So, you know, we didn't  
5 have that at our Davis Besse Plant, but we had it at  
6 our Perry and Beaver Valley Plant, so now we have that  
7 at all three plants.

8 We implemented a major improvements in  
9 plant safety margins. I told you about some of those.  
10 We then have a leak rate program we think will set an  
11 industry standard. That's specific criteria that  
12 management has to take on trends, various model  
13 increases on trends. And it has things that we can go  
14 correlate leaks to, like the filters you were talking  
15 about. So it's an integrated process to go ask if you  
16 see this change, how can you correlate that the change  
17 is real, and it gives you specific areas to go to. So  
18 we think that's going to be a model.

19 We strengthened the corrective action  
20 program, established an Engineering Assessment Board.  
21 One of the things we had at our other two plants that  
22 we've institutionalized here is an Engineering  
23 Assessment Board. So if you want rigor, there ought  
24 to be some board that your products from Engineering  
25 goes through to ensure that you have consistent rigor

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 in those products. And we already had that at our  
2 Perry and our Davis Besse Plant -- our Beaver Valley  
3 Plant, but it was not at Davis Besse. And that  
4 ensures you keep that level of rigor there all the  
5 time. It's like a quality check on your engineering  
6 products.

7 We've assigned owners and new expectations  
8 to the engineering programs, improved problem-solving  
9 decision making processes. We have a procedure that  
10 we use that we use the INPO model from. It's where we  
11 get teams together of our best people when we have a  
12 problem, sit them down and let them bring us, "Here's  
13 what we think caused the problem, here's the  
14 approach," and then gets management approval. And  
15 that structure was not in place there at the Davis  
16 Besse Plant, and it is now.

17 Revised the competencies and the appraisal  
18 process to include nuclear professionalism and nuclear  
19 safety consciousness. We do evaluations on our  
20 managers each and every year, but we did not have  
21 those two areas identified as competencies with  
22 criteria. We do now. So went back and looked at  
23 that. We provide leadership and action training and  
24 additional competencies.

25 Our program for management development is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 called Leadership in Action. What I can tell you is  
2 the feeling I have is that we've really internalized  
3 that program at our other two plants, but at Davis  
4 Besse it's something we sort of check off and put on  
5 the shelf and don't really institutionalize every day  
6 like we do at our other plants. For example, if you  
7 walk in our meeting rooms at our other two plants,  
8 you'll see our leadership principles posted on the  
9 wall. They were not posted on the wall at Davis  
10 Besse, so that's some significant changes that we've  
11 made in the management --

12 MEMBER POWERS: Why is that significant?

13 MR. MEYERS: Huh?

14 MEMBER POWERS: Why is that significant?

15 MR. MEYERS: It's the behaviors you  
16 display in meetings.

17 MEMBER POWERS: The behavior I display in  
18 meetings, if anything is posted on the wall for more  
19 than two months, I ignore it.

20 MR. MEYERS: Well, that's not true. If  
21 you post it on the wall, and one of the things we do  
22 is a delta check after each meeting to make sure that  
23 we comply with the leadership qualities that we  
24 profess. So if we don't --

25 MEMBER POWERS: That might be significant.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Posting it on the wall is not.

2 MR. MEYERS: Well, let me say this: We've  
3 institutionalized those qualities, and we work on them  
4 every day.

5 MEMBER ROSEN: Posting on the wall works,  
6 because if somebody steps outside the boundaries of  
7 one of those factors, somebody will say, "What about  
8 the third bullet up there? Are you really behaving in  
9 accordance with that?"

10 MR. MEYERS: Yes. Do we beat this guy up  
11 or not beat him up or do we really take this posting  
12 seriously.

13 MEMBER ROSEN: Well, it's a way of  
14 bringing it to his attention without being too toxic.

15 CHAIRMAN APOSTOLAKIS: Do we as a  
16 Committee want to write letters, look at that frame  
17 there and ask ourselves whether what we'd write?

18 MEMBER ROSEN: Sure, we do.

19 CHAIRMAN APOSTOLAKIS: Oh, you're unique.  
20 I never do.

21 MR. MEYERS: We do that at every meeting.  
22 Ours is large too. It's much larger than --

23 CHAIRMAN APOSTOLAKIS: It's legible.

24 MR. MEYERS: You can see it a mile away.

25 MEMBER LEITCH: As an industry, I think

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 we're fairly good at sharing operating experience,  
2 what I would call plumbing and hardware issues, but  
3 how do we share these management level commitments?  
4 Presumably, there's some very significant management  
5 lessons that you've learned here. I mean, for  
6 example, you said you made some major changes to your  
7 Off-site Safety Review Committee. I mean how does  
8 that kind of information get around the industry?

9 MR. MEYERS: That's an excellent question.  
10 One of the things we've done, and we're probably going  
11 do another one before long, is we got with INPO and we  
12 did a road show, if you want to, with all the  
13 executives in the United States, and I went out -- I  
14 went to Denver, Atlanta -- where else did we go?  
15 Dallas, New England. So we went and had meetings with  
16 all the executives at all the plants in the United  
17 States. We went over all these lessons learned and  
18 more. It was like a four-hour meeting where INPO went  
19 over their lessons learned, and I spent a couple hours  
20 with questions and feedback in small groups. And  
21 we're probably going to do that again sometime in the  
22 near future.

23 MEMBER LEITCH: That's excellent as far as  
24 Davis Besse's concerned. I guess I'm just wondering  
25 is there any thought to institutionalizing that kind

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 of a process?

2 MR. FELGATE: Just to address your  
3 specific question, one of the other recommendations I  
4 didn't address from Davis Besse was INPO to become  
5 more involved in reviewing as part of our ongoing  
6 evaluations the oversight organizations, corporate on  
7 down. But as to the specific question you're asking  
8 about, Nuclear Safety Review Board, and we'll factor  
9 into it the way we look at those, the lessons learned  
10 from Davis Besse. So that institutionalizes that for  
11 all the plants.

12 MEMBER LEITCH: Okay. Good.

13 MR. MEYERS: Now, from an employee  
14 standpoint, we've taken some actions to improve the  
15 communications. It's amazing the things that I get  
16 told. One of the things we've implemented is what I  
17 call the four Cs meetings. That's meetings that I  
18 have within employees about compliments,  
19 communications, concerns and changes. We talk about  
20 the changes we're making in the plants, stuff like  
21 that. Today, I think I've met with over 500, 600  
22 employees at our plants in groups of about 20 each.  
23 What I do there is I bring an independent person in  
24 and they meet with the team -- the people one day so  
25 they can bring up issues and I'm not there. And then

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 we can talk about them and have dialogue. What's  
2 funny is usually when I go through the issues now the  
3 guys will say, "I brought that one up." So it's sort  
4 of -- and that's a big change in the behaviors I've  
5 seen over the year. I think that's been effective.  
6 We've institutionalized -- trying to institutionalized  
7 the listening process, if you will.

8 From a management standpoint, we do town  
9 hall meetings, all-site meetings and department  
10 meetings now that we routinely schedule to get  
11 information out -- and stand-downs. And what you get  
12 from our employees when you listen to them is,  
13 "Nobody's ever taken this kind of time to talk to us  
14 before." So it's really a pretty -- I've really  
15 enjoyed the meetings that I've had. I look forward to  
16 them. And at the end of each meeting we do a delta  
17 check, and then we -- and I take actions that I follow  
18 up on, and we agree that I will take actions on these  
19 issues at the end of the meeting. And we do the same  
20 thing with town hall meetings and the stand-downs, so  
21 we think we've improved the communications with our  
22 employees.

23 We provide reactor head case studies to  
24 all of our employees. That was a full day training  
25 where we stopped things on-site and in groups of about

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 -- and various work groups just sat down and went  
2 through this whole case study. We've done supervisor  
3 refresher training, Leadership in Action, supervisor  
4 training on the safety conscious work environment,  
5 which is specific safety conscious work environment  
6 we're giving to all the supervisors now again. We've  
7 implemented our operator leadership plan. Remember,  
8 one of the issues we had was we told you we did that  
9 large root cause too. That spurred us to go do some  
10 smaller root causes. And one of the ones we did was  
11 in Operations, another one was the independent  
12 oversight group that you talked about a while ago.  
13 And that made us make changes there. And you heard  
14 about some of the issues that we came out with in the  
15 Operations root cause. So we've got that plan in  
16 place and are tracking items. It all folds up and  
17 under the management human performance plan.

18 We strengthened the individual ownership  
19 and the commitment, both in engineering, operator  
20 licensing, operational decision making process and the  
21 shift manager command and control. Our CEO has met  
22 with each one of our shift supervisors personally, and  
23 I have taken groups of three shift supervisors at a  
24 time to Akron to sit down for a couple hours, each and  
25 every shift supervisor that we have at Davis Besse.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 And we've rewritten the duties and responsibilities of  
2 the shift supervisor on shift and communicated those  
3 very well and made sure that we have buy-in across the  
4 board. And so we think from an operational standpoint  
5 right now the feedback that we get from the  
6 independent groups that come in is Operations is  
7 probably the strongest organizationally. So we feel  
8 pretty good about our Operations group.

9 We've established a site integration plan  
10 for alignment and leadership development intervention,  
11 and what that plan is is a plan that's a longer-term  
12 plan where we before we start up we're going to sit  
13 down with 200 employees, 20 at a time, in groups of  
14 20, and we've got a road map for the next -- to get us  
15 to 2004. As we come up, we'll meet our schedules  
16 assuming, we have mid-cycle outage we've got to do,  
17 we've got -- our people are all worried about the  
18 backlogs that we have. We had all these walkdowns and  
19 everything, and what you really see is our backlog is  
20 going to be pretty low when we start up, a lot lower  
21 than we think anyone's seen before. So are we going  
22 to be able to manage all that stuff, and the answer is  
23 yes. So we've got to sit down and share with our  
24 employees all the things we have to do and make sure  
25 that we have it aligned not only prior to start-up but

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 after start-up.

2 Now, in closing, I'd like to say that  
3 safety culture can be monitored, I believe, with the  
4 existing performance indicators. If you go look at --  
5 now, there's a difference between assessing and  
6 monitoring. If you've got a good operating plant, I  
7 think you're in a monitoring mode, but if -- I think  
8 safety culture can be monitored with existing  
9 performance indicators.

10 There's two real questions that need to be  
11 asked when monitoring safety culture of the two plant  
12 assets. The only two assets that you have are the  
13 material condition of your plant and the people that  
14 work there. So that's where you better focus. Are  
15 the safety margins at your plant in the material  
16 condition and engineering areas improving on a cycle  
17 basis? If you can't have some performance indicators  
18 that tell you that you're PMs are up to date, your  
19 material condition is good, your AI system issues are  
20 being worked off, and the engineering issues you have  
21 on your plate are not great and you're gaining safety  
22 margins every cycle, I don't believe you can look at  
23 it on a yearly basis. I think you have to look at it  
24 on a cycle basis. So in that cycle, if you do not  
25 gain safety margins in your plant, you've gone

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 backwards.

2 From a personnel standpoint, you need to  
3 look at your programs for strength in your  
4 organization: Your employee problem and resolution  
5 program, there's several of those, the technical  
6 training programs that you have in your plant, the  
7 supervisory development programs that you have, the  
8 management developmental programs you have and the  
9 leadership development programs that you have. So for  
10 succession planning if you're not laying leaders out  
11 and developing leaders for the future every cycle and  
12 you have those identified, you're probably going  
13 backwards.

14 Taking strong actions when degradation  
15 exists and any decreases in safety margins, either in  
16 people or material conditions of your plant, will  
17 ensure the organization is what I call built to last  
18 in the future. That's all I have. Thank you.

19 CHAIRMAN APOSTOLAKIS: Any questions or  
20 clarifications? We've asked a lot of questions  
21 already, so why don't we take a break until ten past?

22 (Whereupon, the foregoing matter went off  
23 the record at 3:50 p.m. and went back on  
24 the record at 4:10 p.m.)

25 MEMBER APOSTOLAKIS: Our next speaker is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Jack Grobe.

2 MR. GROBE: Again, thank you very much.  
3 My name is Jack Grobe. For the last 15 months or so,  
4 I've been deeply immersed in Davis-Besse. I've been  
5 serving as the chairman of the Davis-Besse Oversight  
6 Panel for the NRC.

7 I don't think I sleep for two hours and  
8 wake up crying, but it certainly is what I've been  
9 eating, sleeping and thinking day and night for the  
10 last 15 months.

11 With me today is Geoff Wright. Geoff is  
12 a Senior Staff Member from Region 3 and he's been  
13 leading each of our inspections in the Management and  
14 Human Performance area at Davis-Besse.

15 My goals today are to discuss the  
16 regulatory basis for the inspections we're performing  
17 in this area at Davis-Besse. Geoff will describe the  
18 inspection approach we're using in some detail. And  
19 then I'd like to conclude with providing you some  
20 thoughts on potential short and long-term regulatory  
21 oversight improvements.

22 Next slide, please.

23 (Slide change.)

24 MR. GROBE: Prior presenters have  
25 discussed in quite a bit of detail the current U.S.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and international guidance on safety culture, so I  
2 won't go into much detail there. The NRC does not  
3 routinely inspect management or cultural issues. The  
4 focus of our inspection program is what we call  
5 performance based, we look for performance problems  
6 and then if they're risk significant, we further  
7 engage and drill down into those problems to find out  
8 what the root causes might be. Less significant  
9 performance problems are left to the licensee to  
10 address.

11 There is one significant regulation that  
12 could be used to address this area. It's Criterion  
13 XVI of Appendix B, Corrective Action. An effective  
14 Corrective Action Program is essential for sustained  
15 safe operation. And the foundation of an effective  
16 Corrective Action Program is the ability and  
17 willingness of the utility to identify all of the root  
18 causes of a problem. And those root causes should  
19 include cultural issues.

20 Criterion XVI provides us the regulatory  
21 basis for performing the inspections into these areas  
22 at Davis-Besse, since the head degradation, root cause  
23 involved cultural issues.

24 The next slide is just a brief summary of  
25 what Lew Meyers spent a couple of pages on.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 (Slide change.)

2 MR. GROBE: It's a broad overview of the  
3 root causes, the principal causes of the reactor head  
4 degradation were cultural.

5 Let's go to the next slide.

6 (Slide change.)

7 MR. GROBE: The Oversight Panel was  
8 significantly challenged, given the state of  
9 regulatory standards to measure these types of issue  
10 against. The challenge was how do you determine that  
11 the licensee had made sufficient progress that the  
12 plant could be restarted safely and would ultimately  
13 operate on a continuing basis in a safe way.

14 The Panel designed a set of inspections.  
15 The inspection that Geoff is going to describe is one  
16 of those which will give us insight into those  
17 attributes that are essential for safe operation and  
18 continued safe operation into the future. So the  
19 Panel will be utilizing not only this inspection, but  
20 others, as well as the licensee's assessments in a  
21 combined fashion to make a determination of whether  
22 sufficient progress has been made to restart the unit.

23 The inspection, the specific inspection,  
24 we call it Management and Human Performance, was  
25 divided into three phases. The first phase was the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 root cause assessments and whether or not they were  
2 sufficiently broad and deep. There was nearly a dozen  
3 different root cause assessments that were performed  
4 and there was a very, very broad one using the MORT,  
5 Management Oversight Risk Tree approach that went into  
6 organizational issues. But then there were separate  
7 assessments of the operations organization, the  
8 engineering function, quality assurance function, the  
9 oversight committees, corporate support and there were  
10 several others that combined together and resulted in  
11 the corrective actions that would address each of the  
12 building blocks.

13 I believe the Management and Human  
14 Performance building block had some 125 or more  
15 corrective actions that were identified through these  
16 root cause assessments.

17 Phase I and II are already complete.  
18 Phase II was a review of the corrective action plan in  
19 each area and the implementation of those corrective  
20 actions and that the goal was to make sure that those  
21 corrective actions addressed all of the identified  
22 causal factors.

23 The Phase III of the inspection is in  
24 process today. That is an evaluation of the  
25 effectiveness, the on-going effectiveness of those

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 corrective actions. And Geoff will go into some  
2 detail. I just wanted to briefly touch on, again, due  
3 to the state of regulatory structure in this area,  
4 we're utilizing a combination of NRC and international  
5 guidance in conjunction with regional staff,  
6 headquarter staff and contract staff that have  
7 extensive experience in organizational effectiveness  
8 assessments.

9 And between a combination of that expert  
10 team and the guidance, both national and  
11 international, we've put together inspection plans,  
12 detailed inspection plans to accomplish the  
13 assessments in these areas.

14 MEMBER SIEBER: This plan is unique to the  
15 Davis-Besse situation?

16 MR. GROBE: Absolutely.

17 MEMBER SIEBER: So you didn't find regular  
18 inspection plans in the grand scheme of things that  
19 were appropriate for assessing safety culture?

20 MR. GROBE: That's correct.

21 MEMBER SIEBER: If a plant has a bad  
22 safety culture, where would you expect to see it in  
23 the ROP process?

24 MR. GROBE: If we could hold that question  
25 because I've got a number of comments I'd like to get

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 into on that.

2 MEMBER SIEBER: All right.

3 MR. GROBE: Go ahead, Geoff.

4 MR. WRIGHT: If we could have the next  
5 slide, please.

6 (Slide change.)

7 MR. WRIGHT: The third phase of our  
8 inspection program into the Management and Human  
9 Performance area is designed to look into six areas  
10 that the licensee is working on.

11 One is assess the process that they have  
12 used for their internal assessment, that is what Lew  
13 Meyers was talking about on his safety culture model,  
14 to take an in-depth look at that, what the attributes  
15 were and the standards against which they were  
16 assessing their performance.

17 The second item was what we referred to as  
18 the external one which is the assessment performed by  
19 Dr. Haber which you'll hear about later this  
20 afternoon.

21 The third item was to take a look at what  
22 process the licensee is going to use for monitoring  
23 their safety culture in a long-term process, not just  
24 for restart, but on a continuing basis for some period  
25 of time.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1           The next areas that we wanted to look at  
2 was the Employee Concerns Program as it is a subset of  
3 an overall safety culture, as well as those items that  
4 they're using to improve the safety conscious work  
5 environment at the facility and a review team that  
6 they have put in place to monitor and to work on  
7 safety conscious work environment, potentially safety  
8 conscious work environment type of issues called  
9 Safety Conscious Work Environment Review Team.

10           So those are the six areas that we are  
11 looking into. As Jack indicated, we are not judging  
12 at the end of this whether the output from some of  
13 those assessments, whether it's the internal or the  
14 external. My team is not judging the output on  
15 whether it's acceptable or not. The 0350 Panel is  
16 going to take our input and take a look at the output  
17 from those assessments and combine it with all the  
18 other inspection activities and licensee activities  
19 since the issue covers the whole site and not just a  
20 very narrow area. They're going to make that  
21 determination. My inspection team is not going to  
22 make that determination.

23           MR. GROBE: Let me say that in a little  
24 bit different words just to make sure that message was  
25 clear. We are not assessing safety culture at Davis-

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Besse. What we're doing is utilizing national and  
2 international guidance to assess how they're assessing  
3 safety culture and then we're utilizing the extensive  
4 inspections that we've conducted in engineering,  
5 corrective actions and all other areas to look for the  
6 outcomes of the improved safety culture and in areas  
7 where we don't see improved outcomes and there have  
8 been several of those, we clearly articulate that to  
9 the utility and they go back and look again at what  
10 they're doing and the effectiveness of their actions.

11 MEMBER ROSEN: Jack, I think I understand  
12 the structure, but the timing is a little bit a  
13 mystery to me. Don't some of these things take time  
14 to not only be embedded in terms of programmatic  
15 aspects, but also to show outcomes because the  
16 processes have to evolve. How can you assess the  
17 outcomes today of a program you put in place  
18 yesterday? That's an exaggeration, but that's the  
19 issue.

20 MR. GROBE: I had forgotten that Plant A,  
21 Plant B, that Tom put up earlier today and in some of  
22 my younger years I remember that clearly and brought  
23 back fond memories. Both Plant A and Plant B met  
24 regulatory requirements and were safe as defined by  
25 the NRC. Clearly, Plant B had significantly less

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 organizational safety margin than did Plant A.

2 What we're looking for, for restart  
3 decision is sufficient improvement, but by no means do  
4 we believe that that will be the end of the  
5 improvement process, but sufficient improvement to  
6 assure that the plant can be restarted and operated  
7 safely.

8 MEMBER ROSEN: Jack, can you see it? Will  
9 you see enough outcomes to be sure?

10 MR. GROBE: That's for the Panel to judge.  
11 I believe the answer to that is yes. We should be  
12 able to see it. In some areas, we haven't yet seen it  
13 and we're continuing to inspect.

14 One of the -- I can briefly summarize in  
15 kind of some broad contexts what both the internal  
16 safety culture assessment process and process done by  
17 Dr. Haber concluded. What it concluded is that there  
18 were already some substantive changes in the culture  
19 of certain work elements at the plant. There were not  
20 substantive changes in other work elements at the  
21 plant. There was an inconsistency laterally across  
22 the organization.

23 In addition, there was inconsistency  
24 vertically in the organization. There was different  
25 understandings and expectations at some levels in the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 workers as contrasted with the supervisors and  
2 managers.

3 And one of the other findings was that  
4 there was no long-range vision on organizational  
5 effectiveness and a plan on achieving that long-range  
6 vision, in essence, the Nirvana of safety culture.  
7 Where do you want to be in three years, five years?  
8 So the utility has been working on those attributes.

9 The Oversight Panel will not disappear at  
10 restart. It will be in place for an extended period  
11 of time after restart, continuing to monitor. And  
12 that's why it was important to get Geoff's team in  
13 here to make sure that the tools that they're using to  
14 monitor safety culture going forward are effective  
15 tools so that we can utilize those in the future to  
16 depend on them.

17 It's clearly a long-term process. At some  
18 point they've made sufficient progress to authorize  
19 restart and we're not there yet.

20 MEMBER ROSEN: Maybe this is a question  
21 for Lew is you're running the place now, but is that  
22 -- are you going to keep on doing that after restart?

23 MR. MEYERS: I said that we have a longer  
24 term plan now. And we've got a director we put in  
25 charge of organizational effectiveness. Long term

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 plan right now takes us out through the summer of  
2 2004, so we've got a plan in place to continually  
3 assess through 2004 and then maybe at that time it  
4 will be ready to go into a monitoring phase.

5 MEMBER ROSEN: Where you'll move back to  
6 your corporate home?

7 MR. MEYERS: I'll move back before then.

8 MEMBER ROSEN: Well, that was the  
9 question, when are you going to move back? And who is  
10 going to be running the show?

11 MR. MEYERS: We've already announced that.  
12 We already have a Site V.P. that we selected for  
13 Davis-Besse.

14 MEMBER ROSEN: Is he named officially?

15 MR. MEYERS: Yes, Mark Bazilla. So he's  
16 on site now. I'm still there and I'll move back some  
17 time after restart.

18 MEMBER APOSTOLAKIS: All this activity  
19 though and what Jack mentioned, you know, it implies  
20 that you have some sort of what's good in your mind.

21 I wonder whether the reactor oversight  
22 process can take advantage of it and maybe in the  
23 future be modified so that we will not have an  
24 embarrassing incident again where we give all greens  
25 for a plant and then something happens. Are there any

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 plans for doing this or are they doing independent  
2 activities?

3 MR. GROBE: That was actually one of the  
4 recommendations that I was going to talk about.

5 MEMBER APOSTOLAKIS: Okay.

6 MR. WRIGHT: Next slide, please.

7 (Slide change.)

8 MEMBER LEITCH: Just a question about the  
9 Employee Concerns Program, did you find that it was  
10 broken? In other words, was it a failure of the  
11 Employee Concerns Program why individuals didn't bring  
12 some of these issues forward earlier?

13 MR. WRIGHT: We haven't made any  
14 conclusions. What they have done is at the beginning  
15 of this year, an entirely new program was put in  
16 place. They had gone from a single individual  
17 ombudsman program to an actual Employee Concerns  
18 Program with a manager and a number of independent  
19 investigators. So we're looking at -- we've looked at  
20 what they had before and we're looking at what's in  
21 place now to see what are the changes and have  
22 improvements been made.

23 MEMBER ROSEN: In the new program, the new  
24 Employee Concerns Program, is there an internal  
25 oversight group that looks at what the internal --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 what the functioning of that Employee Concerns  
2 Program?

3 MR. WRIGHT: I don't believe -- they have  
4 a program to do an assessment of that organization,  
5 but it has not been done yet.

6 MR. GROBE: Let me flesh this out a little  
7 bit. The assessment that Lew spoke of that was done  
8 last August on safety conscious work environment  
9 revealed there was little confident in the ombudsman  
10 program. And as Geoff indicated, that program has  
11 been completely revamped and strengthened. This  
12 inspection team is continuing to look at the Employee  
13 Concerns Program, but I believe part of the Safety  
14 Conscious Work Environment Review Team, SCWERT, as an  
15 acronym, part of their charter is to look at safety  
16 conscious work environment. And if the Employee  
17 Concerns Program is not functioning effectively, I  
18 think that would surface through the SCWERT function  
19 in their periodic reviews of the effectiveness of the  
20 health of the safety conscious work environment.

21 MEMBER LEITCH: I guess my question was  
22 continuing to look for things that might have  
23 identified this problem sooner. And I guess my  
24 question was really was the Employee Concerns Program  
25 broken and therefore people weren't bringing issues

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 forward and might that be a place to focus on and I  
2 guess what you're saying is you still haven't really  
3 drawn a conclusion in that matter?

4 MR. GROBE: No. I think it was broken.  
5 I think what Geoff was referring to is they haven't  
6 drawn a conclusion on the current existing program  
7 today.

8 MEMBER LEITCH: I see.

9 MR. GROBE: And I think, yes, it would  
10 have been a valid outlet for members of a staff if  
11 they felt their concerns weren't being adequately  
12 addressed, to bring them to the Employee Concerns  
13 Program, but there was little confidence at that time.  
14 There was an ombudsman program. There was little  
15 confidence in it.

16 MEMBER LEITCH: Thanks.

17 MR. MEYERS: I said earlier too, if you go  
18 look at the root cause that we did, we didn't find a  
19 situation where people were not writing CRs. And the  
20 CRs were getting resolved. They were just not getting  
21 properly elevated and root causes done. In other  
22 words, we have these low level CRs. They were treated  
23 as low level CRs and didn't meet the criteria for low  
24 level CRs. So you know more than anything else we had  
25 29 CRs written any one of which could have led us to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 the head degradation issue.

2 MEMBER LEITCH: I guess -- I don't want to  
3 take too much time, but the Employee Concerns Program  
4 is sort of a bypass around that CR process and I guess  
5 if you had an effective Employee Concerns Program,  
6 even if the CRs weren't getting addressed, an  
7 individual could say and elevate the concern that hey,  
8 I've written all these CRs and nothing is happening.  
9 I'm still concerned.

10 But that program was evidently not  
11 functioning effectively either.

12 MR. MEYERS: What I would say is we had an  
13 ombudsman program. We didn't have an Employee  
14 Concerns Program. An ombudsman program, the guy sits  
15 in the office and waits for you to bring in a concern.  
16 We turned our program into a proactive program where  
17 we're meeting with people and trying to find out if  
18 they have concerns. It's a more proactive program.  
19 And we've also done things to improve the  
20 confidentiality of the program.

21 MEMBER LEITCH: Thank you.

22 MEMBER APOSTOLAKIS: The Davis-Besse  
23 incident, it seems to me we're -- obviously, the  
24 licensee had problems, but it's still not clear to me  
25 what our inspectors were doing there.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   Is there a similar panel looking at the  
2 NRC itself?

3                   MR. GROBE: Yes. I guess you've asked  
4 this question three times, so maybe I should answer it  
5 now.

6                   (Laughter.)

7                   MEMBER APOSTOLAKIS: It's been asked three  
8 times?

9                   MR. GROBE: The Lessons Learned Task Force  
10 presented to you several months ago.

11                   MEMBER APOSTOLAKIS: Yes, I've seen that.

12                   MR. GROBE: And they made approximately 50  
13 recommendations in quite a few areas, both regulatory  
14 structure as well as inspection program and other  
15 areas, research. They addressed quite a few areas.

16                   They did not touch on this area, safety  
17 culture. I think this area is very critical. And  
18 Davis-Besse is not unique. Mr. Collins earlier  
19 suggested there might be other plants with equally  
20 challenged cultural aspects to their organizational  
21 effectiveness. There's a number of plants across the  
22 country that have had significant performance  
23 problems, Cooper, Point Beach right now, Indian Point  
24 and I believe there are many cultural attributes. We  
25 now use that word, cultural attributes, to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 characterize what we might have called something  
2 different a few years ago. So I don't believe Davis-  
3 Besse is unique. And I think it's essential that we  
4 do something to address this issue.

5 Dr. Apostolakis, you asked questions  
6 earlier about what were the inspectors doing in  
7 response to the leakage was going up and down, and  
8 the filter clogging and all of those issues. That was  
9 Plant B. They were complying with all of their  
10 requirements. Our inspectors were engaging. The  
11 branch chief was engaging on a regular basis with  
12 plant management, encouraging them to address these  
13 issues in a more proactive nature. But they were in  
14 compliance with all of our requirements. So from that  
15 standpoint, the NRC was limited in its ability to  
16 engage in a more structured way, a more formal way.

17 MEMBER APOSTOLAKIS: What that tells me is  
18 that the two inspectors who were there were doing  
19 their job, but the Agency was not, because if our  
20 requirements allow Plant B to operate, then something  
21 is wrong.

22 MR. GROBE: I think that's the way Bill  
23 Travers has characterized at Davis-Besse, it was an  
24 organizational failure on the part of the NRC.

25 MEMBER APOSTOLAKIS: Yes.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. GROBE: Let me talk in a little bit  
2 more detail. The --

3 MEMBER LEITCH: But there was a  
4 requirement to inspect the head, right?

5 There is a requirement that you can't have  
6 primary system leakage, right?

7 MR. GROBE: Yes. I wasn't around back  
8 then.

9 MEMBER LEITCH: I mean it's not like they  
10 were in compliance with all the NRC requirements.

11 MR. GROBE: Again, they were in compliance  
12 in the context that there were CRs written regarding  
13 the boric acid on the head. Those CRs were resolved  
14 and closed.

15 From time to time inspectors would  
16 question the resolution of one of those types of CRs  
17 and the answer was the head had been cleaned and  
18 everything was fine, that there was not the leakage  
19 that was being experienced, the identified and  
20 unidentified leakage inside containment was not coming  
21 from the head because it had been cleaned and  
22 inspected.

23 And that was documented in work orders, in  
24 the condition reports. So a head is not something  
25 that you can just go out in the plant and inspect. So

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 you have to depend to a certain extent on those types  
2 of interviews.

3 Now one thing we did not take advantage of  
4 and we're encouraging stronger involvement in this  
5 area is video evidence. We could have pursued further  
6 the video record that was made of the head and whether  
7 there was video post-cleaning activities. But we  
8 didn't do that at the time.

9 MEMBER ROSEN: Is there any indication  
10 that those reports were false or misleading?

11 MR. GROBE: There is an on-going  
12 investigation into many of the aspects.

13 MEMBER ROSEN: So that's still yet to be  
14 determined. That's 50.7?

15 MR. GROBE: That's 50.9.

16 MEMBER ROSEN: 50.9.

17 MR. GROBE: I believe the augmented  
18 inspection team follow-up report, it's already been  
19 documented about eight different areas where there was  
20 inaccurate information. What OI is investigating is  
21 what was the cause of that inaccurate information.

22 MEMBER APOSTOLAKIS: So at some point,  
23 someone from the staff will come and talk to us about  
24 the organizational institutional changes that perhaps  
25 will take place within the Agency?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. GROBE: I think Chris Boder and Cindy  
2 Carpenter's folks would be glad to do that. There's  
3 an action plan in each of the areas. There's one  
4 dealing with ASME code requirements and text spec  
5 requirements. There's one dealing with research.  
6 There's one dealing with inspection.

7 MEMBER APOSTOLAKIS: Good.

8 MR. GROBE: And the EDO receives a report  
9 on progress on each of those Corrective Action Plans  
10 every six months.

11 I believe one of those reports was just  
12 completed in the last couple of weeks.

13 MEMBER APOSTOLAKIS: Do we get copies of  
14 those reports? Very good.

15 MR. GROBE: Geoff, I think -- why don't  
16 you try to quickly go through the slides.

17 MR. WRIGHT: All I wanted to do, a couple  
18 more items here for your information and interest. In  
19 the areas of inspection guidance, we do have within  
20 the Agency guidance dealing with Employee Concerns  
21 Program and we have a specific program, procedure that  
22 we can follow. We're using that to look at the new  
23 Employee Concerns Program.

24 I think as Clare indicated before, there  
25 are questions that we do get into on safety conscious

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 work environment. We've interviewed about 45 people,  
2 I believe, or 50 people on the site, as part of the  
3 inspection and have folded in a number of these  
4 questions into those interviews in looking into that  
5 area.

6 For the three areas dealing with safety  
7 culture, where there isn't any specific guidance on  
8 even what a good program should include, we are using  
9 some of the international standards, guidance, the  
10 INSAG documents to look to see the programs that are  
11 being used, do they have some of the same attributes  
12 that are mentioned there. We're looking at them both  
13 as well as the surveys. Were the surveys an  
14 appropriate survey? Did they have the right type of  
15 questions? Did they try to discriminate against -- I  
16 think the question was if a person knows their job, it  
17 depends on their answer. Are you going to get  
18 truthful answers. We're looking at the surveys to  
19 make sure that there are ways of discriminating  
20 against that kind of answer.

21 The interviews that the people, that the  
22 surveys were done, some of the observation of work  
23 activities that were accomplished through, by the  
24 utility and by Dr. Haber's people. We're looking in  
25 those areas to get a feel for how rigorous were the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 evaluations and can, in the future, can the 0530 panel  
2 rely on the output from that evaluation as a good  
3 output.

4 MEMBER APOSTOLAKIS: Has the Commission  
5 ever expressed an opinion about the INSAG documents?

6 MS. GOODMAN: I don't believe the  
7 Commission has. Do you think so, Jake? No. Jake  
8 Persensky is agreeing with me, that as far as we know,  
9 the Commission has not commented on them.

10 MEMBER APOSTOLAKIS: They are aware of the  
11 fact you are using --

12 MS. GOODMAN: Yes, they have been briefed  
13 on those documents. In fact, Jake Persensky has  
14 briefed several of them.

15 MR. PERSENSKY: Jake Persensky from the  
16 Office of Research. In fact, Jack also briefed the  
17 Commissioner's assistants on this particular  
18 inspection plan, what we were doing.

19 As far as the Commission recognizing the  
20 INSAG documents, about the only place you'd see that  
21 would be in the policy statement on conduct of  
22 operations, where in fact, they refer to and take  
23 large quotes out of INSAG 3, which was the only one  
24 available at the time of the policy statement being  
25 developed, but there haven't been any further

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 endorsements of that process, but we've been using it  
2 and it was part of what we were doing in terms of  
3 developing inspection program plan for this.

4 MS. GOODMAN: I was just going to say, we  
5 have given a copy of that policy statement to -- if  
6 you want a copy for all the members, that policy  
7 statement because it is one that has not surfaced  
8 recently.

9 MEMBER APOSTOLAKIS: Because the INSAG  
10 documents were not written for the regulator, right?  
11 It was general documents of the safety culture.

12 MS. GOODMAN: But that policy statement  
13 sort of incorporates a number, at least what the  
14 status was in 1998, have been incorporated in that  
15 policy statement. I've interrupted you now three  
16 times, I think.

17 MR. GROBE: That's fine. I was just going  
18 to further clarify one issue that Jake mentioned. Due  
19 to the sensitivity of this type of inspection, we did  
20 brief each Commission office on details of the  
21 inspection plan and how we were going to approach it  
22 and who is on the team. So they're aware of what  
23 we're doing here.

24 MR. WRIGHT: Next slide, please?

25 (Slide change.)

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. WRIGHT: Here you can just see, we  
2 wanted to let you know who was on the team. As you  
3 can see four of the seven individuals are here today.  
4 You've heard from Clare. You've heard from Jake.  
5 Lisa is here with us as well and myself.

6 The two individuals who are not with us  
7 are John Beck and Mike Brothers. They're consultants.  
8 Both worked extensively at Millstone and have had  
9 extensive experience dealing with safety conscious  
10 work environments and the like, as well as operations  
11 from an executive level in the industry. We thought  
12 from a balance on the team that it was important to  
13 have kind of expertise along with us. So they are  
14 also working with us.

15 The next slide is rather abbreviated and  
16 unless there are questions, I've talked a little bit  
17 about the approach that we're using, evaluating the  
18 surveys that were done and the interviews that were  
19 conducted. I won't go in and take up your time as far  
20 as more details on just the how -- but I would respond  
21 to questions if you have some in that area.

22 MEMBER APOSTOLAKIS: Next slide.

23 (Slide change.)

24 MR. WRIGHT: Go ahead, Jack?

25 MR. GROBE: I just had some broad

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 conclusions, somewhat different than what's on the  
2 page. You can read that. That's self-explanatory.

3 Alan Price suggested that each utility is  
4 evaluating and responding to safety culture issues.  
5 I think the empirical evidence might not support that,  
6 at least wouldn't support that they're effectively  
7 doing it because we continue to have performance  
8 problems, not necessarily as significant as  
9 Davis-Besse's, but still significant performance  
10 problems at various utilities.

11 I believe that there's additional work  
12 that needs to be done in this area. The current  
13 reactor oversight process regulatory intervention  
14 opportunities are two-fold. There's, of course, the  
15 action matrix which is a graded response, but that  
16 graded responses comes on risk-significant outcomes,  
17 so if there are safety culture concerns, it is a  
18 lagging response. I don't know which box you'd but  
19 the arrow between, but it's later on the right hand  
20 side of Tom Murley's slide.

21 The other area of regulatory intervention  
22 is a very limited opportunity to engage in what we  
23 call cross cutting areas. The Agency has defined  
24 three cross cutting areas, human performance,  
25 Corrective Action Program effectiveness, and safety

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 conscious work environment. And the limited  
2 opportunity to engage and this might be what you were  
3 hearing about in Region 1 is that once a year, we can  
4 put two or three sentences into a letter and there are  
5 no structured response requirements or management  
6 meetings or further engagement. It's simply a few  
7 statements that there appears to be some concern in  
8 this cross-cutting area.

9 MEMBER APOSTOLAKIS: But it was made very  
10 clear to us that they cannot be dismissed by the  
11 utility. Even though they're not regulatory  
12 requirements. It would be asking for trouble if they  
13 just said --

14 MR. GROBE: Well, I'm not sure what kind  
15 of trouble they'd be asking for. There is no  
16 provision to do additional inspection.

17 MEMBER APOSTOLAKIS: No.

18 MR. GROBE: It would still be doing just  
19 the baseline inspection. So it is an opportunity to  
20 express to the utility in a public format some concern  
21 that it ends with that, just the expression and  
22 concern.

23 The current inspection procedures under  
24 the ROP examine many of the outcomes, the relevant  
25 outcomes of safety culture. Again, it's focused on

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the outcome and it's based on risk significance. The  
2 entire ROP, the inspection attributes that are  
3 selected, this is now three or four years ago when we  
4 initially put together the ROP, it was baaed strictly  
5 on risk significance.

6 Probably, the most significant insights on  
7 safety culture can be gained from the review of the  
8 Corrective Action Program, as I mentioned earlier.  
9 Significant conditions adverse to quality are not only  
10 required to be corrected, but that the new policy is  
11 expected to be identified and prevention is expected  
12 to be implemented.

13 In addition to that, the utility's trend  
14 lower level significance issues, and when there's a  
15 trend indicated, there would likely be cultural  
16 aspects there. I believe with additional guidance and  
17 training of the staff, we could get more intrusive  
18 into the insights of safety culture effectiveness of  
19 utilities by more thoroughly examining the root cause  
20 in those areas.

21 MEMBER APOSTOLAKIS: But then what would  
22 we do? I mean if these are not requirements?

23 MR. GROBE: Criterion XVI is a  
24 requirement. If they have not adequately addressed  
25 the root causes to prevent recurrence, then that's not

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 consistent with the requirements.

2 The inspection reports that are currently  
3 available to the public are very broad and the only  
4 specific outcomes that are discussed in those reports  
5 are situations where there is a violation. There  
6 would not be any discussion of organizational  
7 effectiveness issues or cultural issues or anything of  
8 that nature in the reports the way our guidance is  
9 currently structured.

10 The industry initiatives pursuant to SOER  
11 204 are quite meaningful and I heard some dialogue  
12 earlier about the Training Institute. I'd like to  
13 clarify just a couple of things. The NRC nominates  
14 one individual on the Board. That's normally a very  
15 experienced individual who doesn't work for the  
16 Agency.

17 In addition, the NRC observes the dialogue  
18 when the licensee is presenting information to the  
19 Board and questions that the Board might have for  
20 them. But the NRC is not permitted to observe any  
21 decision making that the Board does.

22 In addition to that, there's no public  
23 presentation of the findings of the accreditation  
24 board to -- so if we were to incorporate safety  
25 culture concepts into an INPO initiative, there might

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 be certain challenges with respect to the NRC's need  
2 for public scrutability, for public accountability,  
3 public confidence.

4 I was interested in one comment that was  
5 made earlier and that was that there was significant  
6 infrastructure necessary for the accreditation  
7 organization. Well, technical competence of the staff  
8 is just one attribute of safety culture. There's many  
9 other attributes and if there's a need for significant  
10 infrastructure to effectively assess training  
11 accreditation, one would think there would be need for  
12 substantial infrastructure to assess safety culture  
13 effectively also.

14 MEMBER ROSEN: I don't think that was the  
15 thrust of it, Jack.

16 MR. GROBE: Okay.

17 MEMBER ROSEN: My sense of that issue is  
18 that having been there and done that, the utility has  
19 put in place a substantial structure to gain  
20 accreditation and to maintain accreditation. So does  
21 INPO and the National Academy for Nuclear Training.  
22 What I was saying was that if the INPO route which was  
23 offered by George Felgate's concept was chosen, that  
24 that degree of infrastructure, both in the industry  
25 and in INPO need not be put in place because it's

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 really pretty massive in training. We're talking only  
2 about -- at least I was talking only about the fact  
3 that there's a deal struck between the industry  
4 through INPO and the National Academy and the Agency.  
5 Well, a similar deal could be struck in the safety  
6 culture area that INPO will do certain things and the  
7 Agency will have certain access to that and if that  
8 meets the Agency's needs, fine and well. If not, no.  
9 But the structure that comes with the National Academy  
10 of Nuclear Training need not be replicated in another  
11 way. You don't need the National Academy of Nuclear  
12 Training Two to achieve this objective. We kept some  
13 form of averages, true, but not necessarily completely  
14 analogous to the National Academy.

15 MR. GROBE: I'd have to think about this  
16 quite a bit and the devil may be in the details of how  
17 you structure that and the relationships and things of  
18 that nature.

19 MEMBER ROSEN: I don't think anybody is  
20 drawing any conclusion. I'm just pleased to have had  
21 the offer, so now it can be considered.

22 MR. GROBE: A couple other thoughts maybe  
23 to consider. The cross cutting areas defined in the  
24 ROP may not be sufficient. Safety conscious work  
25 environment and Corrective Action Program

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 effectiveness, the attributes that go into a  
2 Corrective Action Program effectiveness do capture  
3 some of the safety culture issues. But they don't  
4 necessarily capture all of them. So it may be  
5 appropriate to revisit the cross cutting areas to see  
6 if they fully capture what we want to be assessing.

7 In addition, the mechanism for regulatory  
8 engagement in those areas may be appropriate to  
9 evaluate that.

10 As I mentioned earlier, guidance and  
11 training for the staff and expanding their  
12 competencies beyond the technical realm of evaluating  
13 engineering quality and Corrective Action Programs and  
14 making sure that thorough root causes in the  
15 organizational effectiveness area may be an  
16 opportunity to further improve on a short term the  
17 effectiveness of the Agency.

18 In the long time, I think Clare described  
19 the direction from the Commission to monitor industry  
20 and international activities in this area and evaluate  
21 the need for any NRC action.

22 One other issue I touched on briefly and  
23 I think it warrants consideration is that the ROP was  
24 originally set up with the inspection attributes  
25 selected on a risk-informed based. And Clare went

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 through quite a dialogue of looking at safety culture  
2 attributes and trying to see backwards how the program  
3 fits into those attributes and found some elements of  
4 them in a number of areas.

5 It might be an appropriate time to revisit  
6 the inspection program, not only from a risk, but from  
7 a cultural perspective and see if there's a better way  
8 to integrated those attributes into the inspection  
9 program.

10 Those are just some thoughts I had.

11 MEMBER APOSTOLAKIS: Very good. Thank  
12 you. Mr. O'Connor from Fermi.

13 MR. O'CONNOR: Thank you. My name is Bill  
14 O'Connor. I am the Vice President of Nuclear  
15 Regeneration at the Fermi Nuclear Plant. I'm also  
16 here as the Chairman of the Board of the Utilities  
17 Service Alliance and we've talked a lot today around  
18 what are the attributes and the Utilities Service  
19 Alliance is a group of plants that I'll talk about in  
20 a second, but we put together what we think is a  
21 credible way to perform, at least a one time  
22 assessment and then figure how to do it in an on-going  
23 way.

24 Now how did I get to be here today? Mr.  
25 John Barton, a former ACRS member, a rather quiet and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 reserved fellow, as you all know, sits on my Safety  
2 Review Board and we made a presentation at our last  
3 Nuclear Safety Review Board meeting about what we were  
4 doing and the results of our assessment at Fermi and  
5 he thought that this form may be one that we ought to  
6 come and at least talk about, but appears to be one  
7 way of doing it that is getting some positive results.

8 Next slide, please?

9 (Slide change.)

10 MR. O'CONNOR: Again, this is just what I  
11 intend to talk about today. Next slide.

12 (Slide change.)

13 MR. O'CONNOR: The Utilities Service  
14 Alliance is a legal entity. It does involve the  
15 stations that are listed on the board. We don't own  
16 each other. We don't control each other's stock or  
17 anything, but we have a Memorandum of Understanding  
18 between us on personnel sharing, common supply chains,  
19 things like that, so -- but our goal is to improve the  
20 operation of our fleet of plants which is slide 4.

21 Next slide.

22 (Slide change.)

23 MR. O'CONNOR: We want to operate a fleet  
24 of safe cost-effective top quartile operators. We've  
25 got some strategic objectives in our business plan and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 that's what USA is all about.

2 I want to jump what really got us going in  
3 this safety culture assessment. At our board meeting  
4 in June of 2002, right after Davis-Besse announced the  
5 head degradation in March, we had been watching very  
6 closely what was going on and one of the questions we  
7 asked ourselves at our board meeting was do any of us  
8 in our plants have the same kind of weakness that  
9 existed at Davis-Besse. So we wanted to do a really  
10 deep dive through our organizations to see what can we  
11 look at, what can we do to hopefully get ahead of this  
12 so that we don't let one of our stations get into a  
13 similar situation.

14 (Slide change.)

15 MR. O'CONNOR: You've seen the next slide  
16 a bunch of times today about what is safety culture.  
17 You've seen the next slide.

18 (Slide change.)

19 MR. O'CONNOR: So move on about what's a  
20 safety conscious work environment.

21 (Slide change.)

22 MR. O'CONNOR: Slide 8, we are looking at  
23 ways to assess the safety conscious work environment  
24 as part of our assessment and I will leave a copy of  
25 this report with the ACRS.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           This is the training manual we use for the  
2 team members that go out on the assessment. It has  
3 all the question banks. It has all the matrices that  
4 we use to do the assessment, how we do the scoring, so  
5 just you can have the details.

6           One of the things we use is the NEI survey  
7 that was developed in 1997, 97-05, around safety  
8 conscious work environment. There's about 21  
9 questions there that we had to try and get an  
10 assessment around, gee, do people really feel okay  
11 about bringing things up. How's your corrective  
12 action process, you know your management conduct and  
13 performance. So this is one of the areas we do look  
14 at and we try to use a consistent survey.

15           Another one that I use at Fermi is the  
16 Gallop 12 survey which looks at employee engagement.  
17 It's got 12 very simple questions. Kind of like what  
18 you heard around Millstone and things like have you  
19 heard from your supervisor in the last 7 days about  
20 your performance? It sounds like a simple question,  
21 but it's very specific, in the last 7 days, which says  
22 is your supervisor out there engaged with you, talking  
23 to you? Do I have the right tools and equipment to do  
24 my job, not does the station have the right tools and  
25 equipment. So it's very personalized down to the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 individual. We get those results and then we watch  
2 the trends of that and I run that survey at Fermi at  
3 least once a year. For a while, we were doing it  
4 twice a year, but our performance has moved up into  
5 the better phases from Gallop's perspective, so we're  
6 running it once a year. But just watching that trend  
7 of what our employees are telling us.

8 You need to find lots of ways to see what  
9 your employees are telling you, not just about my  
10 safety culture is okay, but what other indicators can  
11 you use to reinforce that it's still there.

12 (Slide change.)

13 MR. O'CONNOR: The next slide you've heard  
14 enough about today, safety over-production. The  
15 bottom sentence is true. Management is a driving  
16 force in chasing organizational change and I think  
17 you've heard that from all of the speakers today.  
18 People do look to the top of the food chain, if you  
19 will, and you're going to do what your bosses do. As  
20 an example, at Fermi, I ask everyone during an outage,  
21 go get an outage job. You need to help over there.  
22 If I don't go get an outage job, am I reinforcing the  
23 expectation. Like at one of my outages, I worked as  
24 a decontamination technician. That's a fancy name for  
25 somebody that gets in two sets of PCs and plastics and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 cleans up contaminated areas. But the troops see me  
2 out there doing that and they know Bill knows, Bill  
3 believes it's important for everybody to get an outage  
4 job, so go participate in the outage and do something.  
5 Again, it's that management reinforcement of what is  
6 good culture, do you really walk the talk?

7 (Slide change.)

8 MR. O'CONNOR: Next slide, if you get  
9 production over safety, then you can get to the left  
10 side where you kind of get complacent. You might get  
11 isolated and arrogant, not intrusive, because all  
12 you're worried about is that bottom line. Am I making  
13 megawatts at \$12 an hour or \$13 an hour, whatever it  
14 is, instead of am I doing the right thing?

15 (Slide change.)

16 MR. O'CONNOR: Now the next couple of  
17 slides demonstrate a number of barriers and we've  
18 heard a lot about these things today, management  
19 behavior, staff capability and Corrective Action  
20 Program. Just flip to the next one.

21 (Slide change.)

22 MR. O'CONNOR: Independent oversight,  
23 operating experience and regulatory compliance. If  
24 all these are in place, obviously, an event won't get  
25 through. If none of these are in place -- next slide.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 (Slide change.)

2 MR. O'CONNOR: Then an event can come  
3 through and affect your safety of your reactor. So  
4 again, had to put a little visual on there.

5 (Laughter.)

6 MEMBER POWERS: Is it significant that you  
7 chose block rolls instead of reinforced concrete?

8 MR. O'CONNOR: Excuse me, sir?

9 MEMBER POWERS: Is there a significance to  
10 the fact that you chose block rolls instead of  
11 reinforced concrete?

12 MR. O'CONNOR: No. I probably could have  
13 used a bunch of mini containers.

14 I also had sound effects in it at one  
15 point and I thought I probably shouldn't do that.

16 (Laughter.)

17 But again, what you see here are all the  
18 things you've heard today about management needs to be  
19 engaged. The staff has to be really engaged in  
20 reporting of problems and dealing with things and  
21 technical rigor. All of this together would say you  
22 probably have a pretty good safety culture.

23 (Slide change.)

24 MR. O'CONNOR: The next slide says gee,  
25 even if one or two of them aren't there, enough of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1       them can be there and still result in a safer reactor.  
2       It doesn't mean you're not worried about weaknesses in  
3       operating experience or weaknesses in management, but  
4       it's still -- if you have good staff and good  
5       Corrective Action Program, it should stop it and the  
6       event shouldn't get all the way through. It's the  
7       defense-in-depth concept overall. You need enough  
8       barriers in place that something should not be able to  
9       get through and affect the reactor.

10               Now I'd like to talk about the real  
11       details -- next slide.

12               (Slide change.)

13               MR. O'CONNOR: About how did we get to our  
14       assessment? And the first thing we did over the next  
15       three slides is just these are all the documents. We  
16       stepped back and said, what's everything that's out  
17       there that we might use as possible inputs to come up  
18       with a set of attributes that we can evaluate. So we  
19       looked at the SOER and obviously a bunch of INPO  
20       documents, the team input from those of us that run  
21       the development team.

22               Fermi is very close to Davis-Besse, as you  
23       know, so we had people at virtually all of their  
24       public meetings, trying to gain insights. I was at a  
25       lot of the evening meetings, as Jack will attest to,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 and Lew. So I personally wanted to see it for a  
2 couple of reasons. I have the same newspaper, so Tom  
3 Henry would go to the meeting and then he would ask me  
4 later, well, what's this mean to Fermi? So again, I  
5 can say first hand, here's what I heard. Here's  
6 what's the same or different.

7 So again, part of this is making sure  
8 you're engaged and understand what's going on.

9 (Slide change.)

10 MR. O'CONNOR: Slide 14 is some more  
11 things that we looked at. You've probably heard a lot  
12 about these documents today. Page 15 are some more  
13 items. But the intent of these three slides is not to  
14 list every single thing we did. It's to say we try to  
15 be very comprehensive in looking at what's available  
16 out there for us to better hone our assessment.

17 Now page 16 starts to narrow down what  
18 does it look like or how did we put this into an  
19 assessment tool? So one of the documents we looked at  
20 was INPO's principles for effective operational  
21 decision making. And it has six major attributes with  
22 a whole bunch of sub-attributes, if you will, to add  
23 up to about 60 or 70 items. This is one of them. One  
24 of the items says people at your site recognize  
25 potentially degraded conditions. Well, that's a nice

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 thing to say, but how do you know that? The first  
2 thing is do they have the right knowledge and  
3 understanding of what the safety expectations,  
4 including design and license basis? Have you trained  
5 them? You can say the top one, but if your engineers  
6 do not know what's in Chapter 8 of the USAR around  
7 electrical power distribution, it doesn't matter that  
8 it's in this nice book that's on the wall called your  
9 Updated Safety Analysis Report. You need to make sure  
10 that the people really have that.

11 The second one, are you aware of proper  
12 equipment or system operation and trends? If your  
13 operators don't know what it looks like to be proper,  
14 or your system engineers don't understand it fully,  
15 then they can't assess if it's degraded or not working  
16 right. They can't trend it because they don't know  
17 what it looks like. It sounds silly, but believe it  
18 or not, you can't assume that. You really have to  
19 dive through it and make sure they understand.

20 MEMBER POWERS: One of the problems we  
21 encountered within the Department of Energy reactors  
22 is a culture they grew in running the plants on a  
23 bedding ware and spirit gum. And an entire generation  
24 went through doing that. They didn't have any idea  
25 what a first rate plant looked like because they had

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 never seen one.

2 MR. O'CONNOR: In any good change model,  
3 the first step says you've got to have a compelling  
4 reason for the change, but the second one is you've  
5 got to have a good vision and a vision means to be  
6 able to explain to your people in no uncertain terms  
7 what it looks like to be okay.

8 In other words, what does this change look  
9 like? So again, sometimes we skip a few of these  
10 steps and that's when you don't do a good job.

11 MEMBER SIEBER: You might also look at the  
12 whole concept of questioning attitude in terms of  
13 knowing what the plant is supposed to be doing. When  
14 you perform an operation or a test or something like  
15 that, questioning attitude comes in. When you see  
16 results that differ from what you expect and that's  
17 when the question has to come out. Even if it's  
18 satisfactory, why is it different?

19 MR. O'CONNOR: We talk about training. We  
20 mentioned it several times today and some of my  
21 management observations in our simulator, I noticed  
22 over the last three years that the shift technical  
23 advisors were losing a little of their edge. And  
24 those of us who grew up before TMI and during TMI, I  
25 was a licensed operator then and we saw why the STA

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 function was created and why it was so important. But  
2 what has happened over the years is we've licensed  
3 them. We've kind of integrated them into the  
4 operating crews which is good for the day to day  
5 thing, but they weren't switching hats when the EOPs  
6 come out. So we've been working hard to get our STAs  
7 back to look, your job is not to manipulate controls  
8 and not to be in emergency operating procedure.

9 Your job is to look at the critical safety  
10 functions of reactivity, inventory, heat removal, all  
11 of those kind of things, so when the operators are  
12 manipulating, you're in leg one of the EOP, and they  
13 do this, did the plant do what's it's suppose to,  
14 based on what the operators are doing. So getting  
15 that STA back out into the role, so I mean these are  
16 the on-going things that we have to keep watching for,  
17 to also prevent events. And again, it's a  
18 never-ending battle. It's a never-ending struggle.  
19 You have to keep after it all of the time.

20 So again, this slide shows the kind of  
21 thing we looked at. The next page is one of the score  
22 sheets where we actually took that particular one,  
23 rolled it into a score sheet. Go to the next slide.

24 (Slide change.)

25 MR. O'CONNOR: We also developed question

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 banks. So one of the questions that relates back to  
2 that one was does the station have a trending program  
3 to assist in the identification of repetitive  
4 equipment issues? And we would interview, we had a  
5 set of questions and you'll see it in here from senior  
6 management all the way down to workers. So there's a  
7 set of questions for middle managers. There's a set  
8 of questions for senior managers. There's a set of  
9 questions for craft workers to get at this particular  
10 thing. One of the answers might be well, gee, we had  
11 a particular valve, this F606 in order to fail a  
12 couple of times in the last 15 years, yet gee that  
13 didn't bounce out as a trend. So they got a score of  
14 two. Now what does a score of two mean?

15           You go to the next page. We put a set of  
16 scoring criteria that says 1 to 5. One means every  
17 time, all the time, everything is perfect, not a thing  
18 is wrong. And we were pretty stingy on our grades  
19 when we were out doing these assessments at the plant.  
20 It really had to mean every time you did it right all  
21 the time.

22           Three meant you're doing it pretty much  
23 all the right kind of behaviors most of the time. In  
24 other words, you're pretty confident. Two obviously  
25 is a little less than that and one means you're way

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 out of whack. You're down below acceptable and this  
2 needs to be worked on.

3 Next slide. During the week when we're  
4 out doing the assessment, let me back up a second.  
5 Who did the assessment? We had about 9 or 10 people  
6 on each assessment team. It was led by a vice  
7 president from one of the other stations. In other  
8 words, I'm the team leader for the Columbia Plant. I  
9 had Rich Anderson from Susequehanna with mine. There  
10 was eight other people from the other utilities. We  
11 had members from the international community, OPG,  
12 Ontario Power Gen asked if they could participate and  
13 we're also doing the same assessment for Goose  
14 Pickering, what's their other plant? There's another  
15 one, Darlington Plant.

16 MEMBER ROSEN: One of our distinguished  
17 members doubts the effectiveness of peer participation  
18 in these things. Can you say something about how  
19 critical these guys are? Are they uncritical because  
20 they know you're coming?

21 MR. O'CONNOR: No, not at all. No, not at  
22 all. We had one of their vice presidents of  
23 engineering at our assessment at Fermi and believe me,  
24 he wasn't bashful at all in diving through things and  
25 I think the peer involvement, they have a different

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 plant, but they have the same issues, so they bring  
2 that expertise just to kind of look at it a different  
3 way.

4 Ask the question a little different way.  
5 I'm a very strong proponent of the peers which is why  
6 we use these independent teams to go out to the other  
7 sites. I've got a group of 8 or 10 people. We also  
8 had a couple of INPO senior reps that participated on  
9 the teams to watch how we're doing this. In fact,  
10 INPO posted this on their website as one way of doing  
11 this.

12 So again, what you see then on the wall  
13 during the week and we would post all of the 80 or 90  
14 attributes up there and you see scores of 1, 2, 3, 22,  
15 and that's each of the different evaluators coming in.  
16 And it's not just the questions. It's we watch  
17 meetings. We watched interactions. We saw different  
18 things. We had some pre-reads ahead of time, so like  
19 this particular one would come out of two, the first  
20 one. The second one ended up at 2.6 which says that's  
21 below what's considered fully competent. The third  
22 one we found people asking pretty good questions. Now  
23 these are just some examples -- I just put some  
24 numbers in here, but that's how we did the assessment.

25 The next page, slide 21.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 (Slide change.)

2 MR. O'CONNOR: As I said, we had an  
3 interview question bank for senior management, middle  
4 management and each team member had a set of  
5 questions. There was a set for the senior management.  
6 There's a question for middle management. And we  
7 would divide it up, like I would be talking to the  
8 site VP plant manager level folks, chief nuclear  
9 officer, board of directors' member if we could get  
10 him. So again, we staggered this to make sure we got  
11 a good cross section.

12 The assessment scoring was documented on  
13 our field collection sheets. We interviewed typically  
14 about 80 to 90 people at each of the sites. We  
15 watched lots of meetings. We attended control room  
16 operations. We attended pre-job briefs.

17 Next slide, slide 23.

18 (Slide change.)

19 MR. O'CONNOR: Before we went to the site,  
20 each site sent us a ton of material that we reviewed.  
21 So this assessment actually starts a month or so ahead  
22 of when we go to the site. We ask for any JCO. Now  
23 why would you want to look at a JCO? The plant has  
24 got three or four justifications for continued  
25 operation. That might say, gee, what's up here. It

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 might be an indicator of maybe their safety culture  
2 isn't right. We looked at root cause reports, problem  
3 reports, adverse trends, corrective action backlogs,  
4 self-assessments. Next page.

5 (Slide change.)

6 MR. O'CONNOR: Here's some things that you  
7 might think, gee, what's that got to do with safety  
8 culture? We looked at their O & M and Capital Cost  
9 Trends. If we saw any dramatic changes like gee,  
10 you're running along with \$110 O & M budget and then  
11 you see it's just been dropping \$10 million a year,  
12 that might be okay, but you've also to assess is this  
13 just being driven by something by corporate management  
14 cutting cost out of things? If you see the capital  
15 budget is dropping dramatically, that says maybe  
16 they're not reinvesting in their plants and doing the  
17 right things.

18 The bottom was real important, staffing  
19 stability. You look at a plant and we had one of our  
20 member stations that just went through a lay up. Now  
21 they hadn't had one in a long time, but when they let  
22 those 150 people go, then we dive into that and say  
23 what was your changed management plan? How can you  
24 ensure when those 150 people are no longer in your  
25 system that the programs, processes and procedures

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 that you had in place can be supported with 150 less  
2 people? Howard mentioned or someone this morning  
3 about programs and people. I mean the people make the  
4 programs work and if suddenly you built your structure  
5 on this many and now you have this many, guess what?  
6 People are going to have to do what they have to do,  
7 so then they start diluting the programs and processes  
8 and procedures to be able to cope. So we looked at a  
9 lot of things ahead of time and that prompted us to  
10 ask a lot more questions as we went on. And this may  
11 be an area that George from the INPO side -- I know  
12 INPO typically hasn't gotten into those kind of  
13 things, but here again, looking at that, that is one  
14 of the things that can contribute to a plant not  
15 keeping up performance level.

16 Now what does it look like when we're all  
17 done? And I've just included a couple of sample  
18 slides that would come out of a typical report.

19 (Slide change.)

20 MR. O'CONNOR: In this particular one is  
21 around the results out of the effective operational  
22 decision making set of attributes and you could see  
23 for attribute 2B1, this particular station had a 3.5.  
24 So anything above about a 3, we call that's pretty  
25 good. You got a strength in that area. Keep doing

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 it. Whatever you're doing there, keep doing. The  
2 rest of the ones for that particular site came out of  
3 3.04. So all the rest of the 70 or 80 attributes, the  
4 average was about 3.04.

5 So this station had some pretty good  
6 things. Also, on the next page we point out -- in  
7 addition to the graphs we give verbiage to say why we  
8 thought item 2B1A was a strength. So we don't just  
9 say here's your graphs, go figure it out. There's the  
10 documentation about why it was considered a strength  
11 and what about that the rest of us can learn from it.

12 Likewise for the areas for improvement.  
13 You know this particular one, item 6H, you got a 2.44  
14 on average, so that says you need to pay attention to  
15 that and that station management now has some areas  
16 that if they go focus on these five or six areas, then  
17 can bring them up, that will help the station get  
18 better.

19 MEMBER APOSTOLAKIS: On the scale, 5 was  
20 best?

21 MR. O'CONNOR: Five was off scale. We  
22 gave very few 5s on any attribute.

23 MEMBER APOSTOLAKIS: But how did you  
24 decide what 5 was?

25 MR. O'CONNOR: What we did was collegially

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 we step back and you can have any rating system you  
2 want. What we said was we could have picked four  
3 numbers or three numbers.

4 MEMBER APOSTOLAKIS: No, I understand  
5 that, but what's best?

6 MR. O'CONNOR: The best we just said 5 and  
7 then we wrote down what does 5 mean? That was that  
8 other chart. Five meant you do it right every time,  
9 all the time and all the things are perfect in that  
10 particular attribute, from our quick snapshot.

11 In other words, you go in and you look at  
12 their meeting. It every meeting they start a meeting  
13 with a good safety message, if you saw the team well  
14 engaged and you saw senior management sitting back  
15 watching and making sure things went -- intervening  
16 when necessary. If you went to the control room, the  
17 pre-job brief was perfect, then they did the  
18 evolution, whether it be a rod pole or whatever. You  
19 might check a file.

20 MEMBER APOSTOLAKIS: So it's really what  
21 a group of experienced people believe is the best  
22 practice in the industry?

23 MR. O'CONNOR: Yes, and that's the other  
24 part. We didn't say what do our seven or eight  
25 stations think is best. We did benchmark against the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 INPO criteria for what is best. We did benchmark  
2 against the INPO criteria for what is best practice in  
3 this particular area. So that was the criteria. You  
4 had to be at best practice level to get a 5.

5 MEMBER APOSTOLAKIS: And similarly of  
6 course, for one.

7 MR. O'CONNOR: Same thing for the bottom  
8 number.

9 MEMBER KRESS: Is 2.87 different from 3?

10 MR. O'CONNOR: You mean is it  
11 statistically different?

12 MEMBER KRESS: Would you treat it  
13 differently?

14 MR. O'CONNOR: That's where you have to  
15 read the verbiage around this one. In other words,  
16 you look at what 2.87 was and you say gee, what is  
17 this telling me? What it tells me is for some reason  
18 I'm not fully competent and then you need to drill  
19 through that --

20 MEMBER KRESS: Just one aspect of that  
21 area might have --

22 MR. O'CONNOR: And that's exactly what  
23 this was, one aspect of the 90. In other words, the  
24 one example I used was this attribute on paragraph 1B1  
25 says does the station have a trending program? So I

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 went into here and if one of these was 1B1B, that was  
2 2.87.

3 So he'd go back and say there's something  
4 about my trending program that isn't right. Now the  
5 team back him at what they thought wasn't right, so  
6 that would point the station in the right direction.

7 Likewise, the INPO warning flags we  
8 thought were very important. Now there are several  
9 sets of warning flags that INPO has out there, so we  
10 put a special emphasis on the warning flags and this  
11 particular one, this particular station did pretty  
12 good across the warning flags. An example, item GG in  
13 our report, that warning flag is the one that says  
14 you're over confident. You're looking at your numbers  
15 and you're relying on your past history. I've been  
16 running pretty good. My capacity factor is up so  
17 you've got to kick back. You're living in the past.  
18 So we found at this station there was a little bit of  
19 living on the past positives and not really saying I  
20 need to do any more. So you get into that I'm okay  
21 here and everybody else is going to run by me. So  
22 this station needed a little wake up call -- because  
23 we heard terms like we've been running pretty good for  
24 two cycles and you get little comments like that and  
25 you start thinking.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER SIEBER: What are some of the other  
2 warning flags?

3                   MR. O'CONNOR: The other warning flags,  
4 the second one, FF is industry interaction and bench  
5 marks, managing relationships with your regulators, in  
6 other words, if we sense some contentiousness with  
7 INPO or your regulators. Ops and engineering  
8 standards is BB. These don't -- if you go into the  
9 INPO report it doesn't say that these were what's in  
10 our -- you go in here. So those are the things that  
11 came out. And this is just part of the warning flags.

12                  MEMBER SIEBER: Thank you.

13                  MR. O'CONNOR: Now for my assessment which  
14 was finished up several weeks ago, I just included a  
15 couple items that just to show you what comes out in  
16 the written parts of this, so in one area it says  
17 management oversight of nuclear safety  
18 over-production. That was one of the major bullets.  
19 And the examples were business plan, incentive program  
20 and our management involvement. The team saw those  
21 three attributes were pretty good. As an example, our  
22 incentive program, there's a zero payout for any of  
23 the managers or employees if we don't make our nuclear  
24 safety items. You can get all of the production in  
25 the world, all the other items, but if you don't hit

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 the nuclear safety goals which include things like  
2 your performance indicators on risk, your performance  
3 indicators around safety system availability, you can  
4 do great on everything else, but you get zero payout.

5 So again, it's putting that emphasis up  
6 there. Our business plant starts right out with all  
7 the safety policies and why it's important. So again,  
8 they thought that was very positive.

9 There was no reluctance to raise issues  
10 and a very strong partnership between management and  
11 the craft. So these are the three areas that turned  
12 out as strengths in my report. I had some other ones.  
13 I just listed some examples.

14 They also pointed out some areas that we  
15 weren't doing as well as we should. Our work control  
16 process. We've got a very antiquated computer system  
17 work control process that's quite cumbersome and what  
18 it leads to is there's some fragmentation of some of  
19 our reliability improvements, so they pointed out to  
20 us that yeah, you've got the stuff there, but it's  
21 tough for the troops to figure out what's the next  
22 most important item from the work control system. So  
23 I'm not going to go through all of these, but again,  
24 they gave us very detailed comments about what they  
25 saw that was less than fully competent.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           This is a roll up that would go to the  
2 executives at the board. So in other words, of the  
3 five plants that we've done so far, we're going to  
4 finish the two up by July. On the INPO warning flag  
5 and this is one warning flag, there's a roll up for  
6 each one of these and each attribute that we, the  
7 executives get, and you can see, two of the plants,  
8 pretty positive.

9           In other words, this is the variance from  
10 3.0. So Plant A had -- you know, basically, they were  
11 running about 3.4 on this one. Plant B was 3.5, so  
12 well above the average. Plant C and D were competent,  
13 a little bit low, but here's Plant D. And this  
14 particular plant on this warning flag said the orbit  
15 site organizations demonstrated an unbiased view and  
16 delivered tough messages. Self-assessments, high in  
17 problems and addressed. This plant was well below  
18 what would be considered fully competent.

19           So, we, the executives on USA, will  
20 challenge each other and say what do you need, Plant  
21 D, here? What can we do to help, but more  
22 importantly, what are you doing to bring us up because  
23 we as a fleet don't want to be pointing on the bottom  
24 side of this. So it's this peer challenging among the  
25 executives to boost each other up and help the other

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 stations that need it.

2 This is a roll up right now of the five  
3 stations that we finished and the scores. So we've  
4 got a couple of stations at 3.2, 3.25, one at 3.08 and  
5 one at 2.94 and one 2.96. I didn't put the station  
6 names down there. The other execs said they'd rather  
7 talk to you personally, if you want to know who's who.  
8 But mine was a 3.2, so I will tell you mine.

9 (Laughter.)

10 And on average is 3.09 for the five  
11 stations. On average, we feel confident, but on  
12 average doesn't count. You still have got to dive  
13 into those various rooms for improvement and find out  
14 what do I need to with the station in these particular  
15 areas. Much like you do with your INPO eval. INPO  
16 comes in and gives you a score, but they also tell you  
17 areas for improvement and strength. You need to  
18 really dive through the areas for improvement and work  
19 on that.

20 Where do we go from here? This assessment  
21 is clearly a spot check. We think it's a really good  
22 way to do it. It was very intensive, very labor  
23 intensive, very resource intensive, but we think we  
24 got a really good check on where our stations sit. Me  
25 as a site VP, the things that I got out of this

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 assessment will really help me to continue my  
2 improvement efforts at Fermi. And what we're looking  
3 at now as USA, (1) how can we do a -- rather than this  
4 round robin spot check every year or 18 months or 6  
5 months or whatever it is, we've got to find a way to  
6 make this into our day to day activities in our QA  
7 assessments, our ISRG Assessments and things like that  
8 to figure how we can keep pulsing this day to day, our  
9 management observations. So that's the next step.  
10 We're going to start working on that.

11 And again, that's the last slide on -- it  
12 is an SOER. You heard George say this. It will be  
13 done that they keep assessing. Again, it's how do we  
14 continue to do that as a group of plants and as an  
15 industry. But again, this was one method. I just  
16 thought it good to share with the ACRS, one way of  
17 doing it. We've been kind of bouncing around it today  
18 and I think it was pretty effective.

19 MEMBER APOSTOLAKIS: How long have you  
20 been doing this?

21 MR. O'CONNOR: We have five plants done.  
22 We started the first plant in January, so we've been  
23 basically doing one a month.

24 MEMBER APOSTOLAKIS: Okay.

25 MR. O'CONNOR: And we will finish the last

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 plant in July. So all of the plants will have been  
2 through their INPO 02-04 assessment recommendation B.  
3 That's what we're using this as the recommendation B  
4 assessment.

5 MEMBER APOSTOLAKIS: And you plan to go  
6 back then?

7 MR. O'CONNOR: That's the slide here.  
8 What frequency do we think we need to do this? How  
9 can -- I don't want to just wait for another round  
10 robin, we want to build it into our day to day and  
11 routine QA assessments and management observations,  
12 but I also think it's important every now and then to  
13 have that team come around and do assessment against  
14 what's considered.

15 MEMBER LEITCH: How about the third  
16 recommendation on the INPO SOER? What are you doing  
17 about that? That seems to me it would be more  
18 difficult --

19 MR. O'CONNOR: The third one is probably  
20 the most difficult and that's the one where you have  
21 to go back and try and pick at what are those things  
22 that are just kind of nagging out there. As I look at  
23 my station, particularly, we've got some issues around  
24 out heater drains where whenever we test our turbine  
25 bypass valves quarterly and Fermi is probably unique.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 We've got two huge turbine bypass valves instead of a  
2 bank of six. The operator has to be just perfect on  
3 the hand auto station to keep that valve open.  
4 Otherwise, a trip, the pressure drops, it messes up my  
5 heaters. I trip my heater drains and I get a recirc.  
6 run back at 65 percent. That's not a good thing to do  
7 to your plant.

8 We've kind of lived with it. We've gone  
9 through it, but we've got to find a better way to do  
10 that, you know. Half the time I do one of these tests  
11 I end up at 65 percent power and I shouldn't do that.

12 That's one of those things that we've  
13 lived with too long. One thing, maybe we don't need  
14 to test the valves every quarter. Maybe it's one of  
15 those things, the valves always work. It's just maybe  
16 there's a design issue that we can do it different.  
17 So --

18 MEMBER LEITCH: The difficult thing, it  
19 seems to me is many plants have these issues, but over  
20 the years you get used to them or you compensate for  
21 them procedurally. They may even be entered into your  
22 training program. Hey, this is how you got to kick it  
23 here to make it work. And those kinds of things  
24 become institutionalized.

25 MR. O'CONNOR: Right, and again this is

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the -- we've gone back into our hard databases and  
2 looked for gee, is there some component that's had  
3 more than a couple of failures? We interviewed all  
4 the system engineers.

5 We're interviewing all the operators.  
6 Just dump on us everything you think might be out  
7 there that you think you're having to live with and so  
8 again, this one is a difficult one. You just have to  
9 get out there and talk to a lot of people. You have  
10 to think about what have we changed in our procedures.

11 There's a wealth of knowledge in your  
12 training instructors. There's a wealth of knowledge  
13 in your operators about how they have to do things and  
14 believe me, they're not bashful to tell us about it.  
15 We have lists of things now that we're going back and  
16 taking another look at. Some of them we may decide  
17 it's still okay. But others, it probably isn't.

18 MEMBER LEITCH: The results that you got  
19 here, would you expect that that would be  
20 significantly different than you get on an INPO plant  
21 evaluation?

22 MR. O'CONNOR: I think we did a lot deeper  
23 dive than you would get on an INPO plant eval. One  
24 reason is we had 8 or 10 people specifically focused  
25 around only these attributes, this group of 60 or 70

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 attributes. The INPO team comes in. They've got a  
2 couple of week window. They have to look basically a  
3 quick snapshot across a lot of higher level things and  
4 while they do walk down the plant and do things like  
5 that, I don't think that without a whole lot more  
6 people and more time that they could dive through it  
7 at this level. Now we may find better ways to help.  
8 They may not have to in the new INPO evaluation  
9 process. They're going to look at how we're assessing  
10 ourselves and they will judge are we doing a good job  
11 or not.

12 MEMBER LEITCH: Yes.

13 MEMBER APOSTOLAKIS: So let's say the  
14 Agency decides that this is a great program or some  
15 variation of this program, where -- at which step  
16 would you say the Agency should be informed of what  
17 results you're getting or what's happening so that  
18 they will have this warm feeling that, yes, the  
19 industry is self-assessing itself?

20 MR. O'CONNOR: And we have thought through  
21 that and here's what I intend to do with my report and  
22 I'm sure the other stations are similarly doing this.  
23 I'm going to sit down with my residents to begin with.  
24 I'm going to sit down with my branch chief, Mark Ring,  
25 and go through here's what we did. They already know

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 what we did because they saw us talking about this at  
2 our morning meetings and all that. But then here's  
3 the areas that we found at Fermi and here's how we  
4 entered it into our Corrective Action Program and  
5 here's what we're doing about it.

6 Now if you go into the Reactor Oversight  
7 Process, one of the areas in the cross cutting is your  
8 problem identification resolution. That's not limited  
9 to hardware problem identification. These are  
10 problems. Did we identify them ourselves and are we  
11 working on them, are they in our corrective action  
12 process? So again, I think the door is already open  
13 there for the regulators to look at are we identifying  
14 our safety culture problems as well as we identify our  
15 hardware problems. Safety conscious work environment,  
16 another cross cutting area. How are we looking at  
17 that? Are we taking it serious? Are we entering into  
18 the corrective action process.

19 So again, I feel that getting there,  
20 especially to the folks that are directly overseeing  
21 us, our resident inspectors, our branch chief and our  
22 project manager, that's the first step. And if  
23 they're convinced that we're continuing to work on it,  
24 I think that's okay. If Jack and his team sees -- I  
25 blew this thing off and didn't do anything with it,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 then I think he has a right to say gee, you told us  
2 about this stuff. You entered it into your Corrective  
3 Action Program, but you didn't do anything with it.  
4 That's probably the doors open plenty far enough to  
5 say, ineffective problem identification resolution.

6 MEMBER APOSTOLAKIS: But also -- I think  
7 it's great that you are sharing the results with  
8 appropriate NRC people, but a methodology like this or  
9 again, maybe two or three similar methodologies, is to  
10 be blessed by the Agency, shouldn't it have a chance  
11 to review it and maybe make some comments? I mean  
12 you're relying now on INPO documents and so on. I  
13 mean there may be a perspective from the staff that is  
14 not there. I would hate to say they should treat it  
15 like a draft regulatory guide, but I mean something  
16 that will also take the NRC staff's input. Would you  
17 be amenable to that?

18 MR. O'CONNOR: Yes. I'll speak for me  
19 personally. I've got my USA Board Member hat on. I  
20 would have no objection to have the NRC take a look at  
21 this. We can leave it here. If they've got some  
22 areas that they think, gee, here's a better way to  
23 think about this, that's another input. Just like  
24 INPO looked at it with us and we took input from them.  
25 We brainstorm as best we could and this is round 1.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           In the spirit of continuous improvement  
2 round 2 will be a better one because we'll find --  
3 we've already found ways that we want to change some  
4 of the things as we got through the first five  
5 stations. We changed some things from station to  
6 station a little bit, but we think round 2 will even  
7 be better. So me, personally, I would have no  
8 objection to Jack or Sam or anybody's -- pass it out  
9 to their team and say what do you guys think? Is  
10 there some other ways you might want to look at it?

11           MEMBER APOSTOLAKIS: Very good.

12           MEMBER POWERS: Suppose NRC looked at it,  
13 George, and said it's the greatest thing since they  
14 started putting beer in bottles and what are they  
15 measuring?

16           MEMBER APOSTOLAKIS: What are they  
17 measuring?

18           MEMBER POWERS: Yes.

19           MEMBER APOSTOLAKIS: I think the scales  
20 that have been presented are what Sonja would call  
21 bars, I think, aren't they bars essentially? It's a  
22 schedule 1 to 5, 5 being best.

23           MS. HABER: There are no behavioral  
24 anchors. It's just a question of having rates on  
25 them.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER APOSTOLAKIS: There's lot of  
2 behavior.

3 MS. HABER: It's similar scale. Different  
4 concept.

5 MEMBER APOSTOLAKIS: The idea is that you  
6 have a scale where people who are intimately familiar  
7 with operations --

8 MEMBER POWERS: I heard the words. I know  
9 the questions they ask and what not. But are they  
10 questions that the Agency wants answers to? I  
11 understand how it can be used to infer things that the  
12 Agency professes to want to know, but if you're  
13 looking for safety culture as a leading indicator and  
14 degrading performance that can lead to an event, it's  
15 not clear to me that this does that.

16 MEMBER APOSTOLAKIS: That's why I asked  
17 whether the staff would have a chance to review it,  
18 because --

19 MEMBER POWERS: If the staff reviewed it,  
20 they could review it until they're blind in the face.

21 MEMBER APOSTOLAKIS: Why?

22 MEMBER POWERS: There is no proof that  
23 having a 3.2 shields you from having events or even  
24 reduces your vulnerability to events.

25 MR. O'CONNOR: But at least it points out

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 areas that you have a potential vulnerability. If the  
2 station works on it, I think it lessens the  
3 possibility event. Will it preclude it, prevent it?  
4 I absolutely can't answer -- stars could line up on  
5 next Tuesday --

6 MEMBER POWERS: That's exactly right. And  
7 from your perspective I think the biggest problem  
8 anybody has running something is knowing what can go  
9 wrong. It's hardest thing to find out in the world  
10 until it breaks. And that's not when you want to know  
11 when something is wrong.

12 That's not what the NRC needs to know.  
13 Now why NRC wants this as an indicator. They want it  
14 because they want to protect the public health and  
15 safety. And there's no proof that it does that.

16 MEMBER APOSTOLAKIS: Well, but again,  
17 plausibility.

18 MEMBER POWERS: I will grant you  
19 plausibility.

20 MEMBER APOSTOLAKIS: Aren't you putting  
21 nearly an impossible condition here? To me, if you  
22 want proof -- well, I don't know what kind of proof  
23 one can give you. We can start with someone that is  
24 a plausible argument and you agree that these things  
25 are good. It's better to do them than not to do them,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 right?

2 Now whether they guarantee, whether they  
3 are sufficient conditions for a safe operation, I  
4 don't think anybody would claim that.

5 MEMBER POWERS: I think if you could sit  
6 here and show me.

7 MEMBER APOSTOLAKIS: Pardon?

8 MEMBER POWERS: If you could show me that  
9 a 2.6 plant has a 50 percent more probability of  
10 having an undesirable event and you can define  
11 undesirable event any way you want to, whereas a 3.2  
12 plant only has a 10 percent probability of having an  
13 undesirable event over the next 18 months, then I'd  
14 say fair enough, you've got something here. I can --  
15 I'm willing to -- but in the absence of that kind of  
16 information, then I think these guys have got a hell  
17 o fa good management tool and as a regulator I applaud  
18 you. But I'm not going to use it --

19 MEMBER APOSTOLAKIS: Do you have such a  
20 proof for special treatment requirements?

21 We are demanding them. Do you have proof  
22 that the probability of failure goes down by 10  
23 percent or 20 percent?

24 MEMBER POWERS: I'm not asking to add in  
25 special treatment requirements --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER APOSTOLAKIS: What I'm saying is  
2 that there is already a precedent where the experts  
3 within the Agency decided --

4 MEMBER POWERS: That's not a criterion for  
5 adding something in.

6 MEMBER APOSTOLAKIS: What?

7 MEMBER POWERS: That's not a criterion for  
8 adding burden.

9 MEMBER APOSTOLAKIS: No. It's not a  
10 burden. They're doing it. We are not adding  
11 anything.

12 MEMBER POWERS: It is a burden as soon as  
13 we ask them to share it with us.

14 MEMBER APOSTOLAKIS: No. We're trying to  
15 avoid imposing burden by saying okay, you guys are  
16 doing great, but on the other hand, I cannot, if  
17 somebody asks me, how do you know they're doing great?

18 MEMBER POWERS: George, if he turns it  
19 into the NRC, he signs something that says if I happen  
20 to make a mistake here, knowingly, you can send me to  
21 jail. That's burden.

22 MEMBER APOSTOLAKIS: I don't know about  
23 that.

24 MEMBER POWERS: You create burden --

25 MEMBER APOSTOLAKIS: I --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1                   MEMBER ROSEN:    You're making arguments  
2                   that don't really go to the issue here, Dana.  I think  
3                   what we're --

4                   MEMBER POWERS:    It certainly goes to my  
5                   issue.

6                   MEMBER ROSEN:    Well, okay, the -- to me,  
7                   what you're suggesting -- the excellent here is the  
8                   enemy of the good and I think that we shouldn't allow  
9                   that.  I think what's been described here as you even  
10                  agree is a useful exercise for the USA Alliance and  
11                  the suggestion that George Felgate of INPO made and  
12                  may ultimately be useful for us, that neither of those  
13                  attributes are perfect, but they're better than doing  
14                  nothing and that's the alternative.  We're sitting  
15                  here --

16                  MEMBER POWERS:    That's absolutely not  
17                  true.

18                  MEMBER ROSEN:    With nothing.

19                  MEMBER POWERS:    As soon as you do  
20                  something, you're consuming resources that could be  
21                  better spent on other things.

22                  MEMBER ROSEN:    It's a logical argument.

23                  MEMBER POWERS:    You're consuming a little  
24                  bit of resources that do something that's much better  
25                  than what we've got which is next to nothing.  We have

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 no insight to the safety culture of the utilities.

2 MEMBER ROSEN: We have all the pieces, but  
3 have no integration. This is an offer of integration.  
4 We'll debate this some more obviously.

5 MEMBER APOSTOLAKIS: I'm sure when the  
6 time comes to think about the letter, this issue will  
7 come up again. But it's 5:30, so maybe we should let  
8 Sonja --

9 MS. HABER: We can say last, but not  
10 least. We can say --

11 MEMBER POWERS: Sonja has the answer to  
12 one of my questions.

13 MS. HABER: Well, I hope. We could say  
14 I'm at a disadvantage because you've heard so much and  
15 a lot of everything, but I can say I'm at an  
16 advantage, because I think I can provide you with a  
17 couple of different things, having had the benefit of  
18 having heard everything.

19 I think that -- next slide, please?

20 (Slide change.)

21 MS. HABER: Rather than introduce myself  
22 and my background, I want to tell you about my  
23 involvement in this area which really defines who I am  
24 and why I'm here. As Tom Murley said this morning,  
25 back in the late 1980s we were not allowed to use the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 word safety culture when we did work for the NRC. And  
2 Tom, in fact, was an instigator for a project called  
3 the Influence of Organization and Management on Safety  
4 Performance. And that's how I really got involved at  
5 this. I was at Brookhaven National Laboratory and  
6 ended up being the project integrator for many years.  
7 That project, as George can tell you, involved many  
8 different groups from academia, from industry, from  
9 the National Laboratories, from other industries, to  
10 really look at what is the influence of organization  
11 and management on safety performance and really, I  
12 think what we're calling it now is a/k/a safety  
13 culture to really a large extent.

14 What I do want to say is that at the time  
15 of the NRC work, we did pilot method that came out of  
16 that project and the method I will talk about some of  
17 the methods and some of the behaviors that we used to  
18 look at organization and management. We piloted at  
19 three facilities. One was a fossil facility of PG&E  
20 and the other was Diablo Canyon and then we also  
21 piloted at Graham Leitch's plant at the time, at the  
22 Limerick Station. So there was some precedent and  
23 then, of course, various regulatory decisions were  
24 made not to pursue that work in about the mid-1990s.

25 Subsequent to that time, and while we

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 still had that data, we did start an initial project  
2 to answer some of the questions about correlation to  
3 other types of indicators. And we did try to look at  
4 the data that we obtained from this assessment of  
5 organization and management to other performance  
6 indicators that the NRC was collecting at the time.

7 We started to find some interesting  
8 relationships with human errors, from the OER  
9 database. But again, that work was basically  
10 discontinued. So there was an attempt to try to  
11 correlate the data we collected with other indicators.

12 We worked on the front end of the work  
13 trying to define the organization and management  
14 behaviors and George and his colleagues really worked  
15 on the back end because Tom Murley's question was how  
16 can we incorporate the influence of organization and  
17 management into -- at that time we called it  
18 probabilistic risk assessment. So in fact, was there  
19 a way to quantify these things to actually then tie it  
20 to risk. That was the initial question of that  
21 research project.

22 And I think we came interestingly close at  
23 some point with some very good work between the  
24 behavioral sciences and the engineering discipline.

25 Subsequent -- well, during that same time,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 actually, I was involved in some Department of Energy  
2 work. If you remember, they had Tiger Team appraisals  
3 and we supported the management subteam of those  
4 appraisals by conducting the survey, a paper and  
5 pencil questionnaire, the same one that we had decided  
6 to use in the NRC organization and management work.

7 In 1995, after the NRC decided not to  
8 continue the work, at that time, the Atomic Energy  
9 Control Board of Canada approached us and said well,  
10 we'd be interested in pursuing this. We think it's  
11 important and we'd like you to help us adapt it or  
12 work on it or update for purposes of using it at our  
13 Canadian facilities.

14 I'm still working on that project and I'll  
15 tell you just a little bit about it because I think  
16 it's interesting from a regulatory perspective. They  
17 have -- we piloted it. We updated some of the work  
18 that we had done for the NRC and the R&D program. We  
19 piloted it at one of their stations and then we went  
20 ahead and implemented it across the major licensees.  
21 Now, of course, you know they are a much smaller  
22 industry, but we did conduct nine evaluations, using  
23 basically the methodology that had been developed  
24 through the R & D project for the U.S. NRC, with some  
25 modifications which I'm not going to go into now, but

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 primarily the same type of tools and the same types of  
2 behaviors that we were looking at.

3           They are now going to do something very  
4 interesting which might be of interest to you, is they  
5 have decided to go back and re-evaluate the first  
6 plant that we did which was the pilot plant and we're  
7 going to conduct that evaluation using the same  
8 methodology as we did before. And independently,  
9 they're going to have their -- what they call project  
10 officers, your resident inspectors, as well as other  
11 people that conduct inspections at those facilities in  
12 health physics and quality assurance and other types  
13 of areas and put their inspection findings from the  
14 work that they've done within a period of time at that  
15 site, the same site, into the similar type of  
16 framework that I'm going to talk to you about in a  
17 minute. So they're going to have their inspection  
18 findings in the framework. We're going to have our  
19 evaluation data in the framework.

20           And then there's going to be a comparison  
21 made between what in the inspection process is not  
22 being captured that perhaps is captured in our  
23 evaluation methodology, what could we do to enhance  
24 that inspection process to capture those safety  
25 culture attributes or characteristics or, in fact, are

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 there some things that we just have to get using  
2 independent methods that cannot be captured by our  
3 regular inspection activities. So that project will  
4 take place in the fall. So that should be of interest  
5 from a regulatory perspective.

6 From 1995 to 1998, I also had the  
7 opportunity to do a lot of work in Soviet design  
8 reactors as part of a U.S. technical assistance  
9 program through DOE and the reason I mention that is  
10 that we had an opportunity to collect again similar  
11 types of organization management data at three Soviet  
12 design plants, an opportunity now to really look at  
13 cultural differences within the industry across  
14 countries.

15 MEMBER APOSTOLAKIS: Soviet design or  
16 Soviet operate.

17 MS. HABER: Soviet design because one was  
18 in Bulgaria. And one was in Ukraine and one was in  
19 Russia.

20 Starting in 1998, I had an opportunity  
21 start working with the IAEA in the safety culture  
22 arena. I've done some of their safety culture  
23 evaluations with them. Also conducted some work  
24 trials with them and consultancies. And in  
25 particular, the reason I mention that is when I talk

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 about the framework, some of the most recent work came  
2 out of the consultancy in December where they're now  
3 moving beyond the INSAG 15 into a guideline for how to  
4 assess safety culture. So I think that will be of  
5 interest.

6 From 2000, the Spanish regulatory body was  
7 interested in looking at organization and management  
8 and they started a project as well and I was working  
9 with them and got to implement the methodology in two  
10 plants in Spain, a BWR and a PWR and just coming out  
11 of a workshop a couple of weeks ago with the  
12 regulators in Spain. They are now taking forth an  
13 action plan that will basically ask their licensees to  
14 have some type of assessment of safety culture, safety  
15 management systems, but they're really talking about  
16 safety culture characteristics.

17 So they intend to ask their licensees to  
18 do that as well.

19 And then, of course, as many of you know,  
20 I was involved this past year in the Davis-Besse  
21 safety culture evaluation.

22 The evolution of safety culture, I think,  
23 I just want to mention this because I'm going to go  
24 into more detail in a minute, really has three phases.  
25 I think the first is from the R & D work from the NRC,

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 identifying the behaviors that impact safety  
2 performance and the methods and how to assess them and  
3 then there was another phase in terms of high  
4 reliability organizations and I'll talk about that in  
5 a minute and finally, the one that we're working with  
6 today, if you read the Davis-Besse report, you'll see  
7 the safety culture characteristics in there.

8 Out of the first phrase which were the  
9 organizational behaviors from the NRC work, we  
10 identified 17 organizational behaviors and it occurred  
11 to me that one of the behaviors, one of the things  
12 that I've been hearing about today, George, was David  
13 Oakwin's \* (5:39:54-need correct spelling) concept of  
14 technical knowledge where -- and he also participated  
15 in this project as part of George's group, the notion  
16 again of having that information, that big picture of  
17 the systems and the operation of the plant.

18 But there are several behaviors in there.  
19 I did not bring the list with me, but some of them are  
20 the ones we've been talking about today, communication  
21 and decision making and goal setting and problem  
22 identification and resolution. And these were --  
23 they're not new. We all know about them, but I think  
24 in that project we went through a lot of peer review,  
25 a lot of workshops, a lot of input and I think we all

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 felt pretty comfortable with that list of behaviors.

2 As I mentioned, we had data collection  
3 tools then to develop, that we developed for the  
4 assessment of behaviors, but we didn't develop them  
5 from scratch. The NRC's requirement was they have to  
6 have gone under peer review and scrutiny. They didn't  
7 want us to do R & D. They wanted methods that  
8 existed, that had demonstrated reliability and  
9 validity, a very important concept. It's very easy to  
10 write questions and ask people questions. It's not  
11 difficult to write rating scales and have people put  
12 marks on a piece of paper. And a lot of people just  
13 put surveys together. But they don't look at it  
14 psychometrically to know whether or not are they  
15 measuring what they really think they're measuring in  
16 a validity sense and will their results be consistent  
17 in a reliability sense. If I measure you today and I  
18 measure you next week, will I get similar results? So  
19 we wanted tools that had undergone that kind of peer  
20 review and scrutiny. And we did. We came up with  
21 four of those tools, plus we use, as Bill described,  
22 not dissimilar, a functional analysis where we get  
23 documentation from the stations and information to  
24 help us understand what they're doing. But aside from  
25 that, we have a database of interview questions which

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 we do from top to down, like you talk about, and also  
2 across the organization, across different departments.  
3 And the reason we do that is, as we've heard today,  
4 it's important to know where the differences are in  
5 the organization; the operations group answering in  
6 one way, the maintenance in another, senior management  
7 one way, the working level in another. So we use that  
8 same type of notion.

9 We have behavioral anchored rating scales  
10 that George mentioned. The difference here is a  
11 rating scale, but the person identifies their  
12 perception of that behavior, based on an example, so  
13 you actually give them an example of how a plant might  
14 deal with communication and you give them the  
15 attributes of very good communication in the first  
16 example. There are five examples and the last one has  
17 the absence of all of those attributes. They get to  
18 put an X next to the one that they think represents  
19 their perception of that behavior.

20 These were developed with industry  
21 experts. They were not done by us. They were done by  
22 people from the nuclear industry to actually make  
23 those attributes meaningful to people when they  
24 complete them.

25 We also have observational checklists so

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 that we can actually, when we go and look at a meeting  
2 at a plant or a work process, we look at attributes of  
3 the same 17 behaviors that we've been talking about.

4 Finally, we have a survey which is a paper  
5 and pencil questionnaire. And the reason I'm telling  
6 you about this is that one of the things that we  
7 provide, I think, that I haven't heard a lot about and  
8 I'll talk about in a minute more, is we really ask  
9 people for their perceptions about things. Now, we  
10 get a lot of criticism about that because people say  
11 well that's just somebody's perception. But I think  
12 I don't have to tell you that perception is reality to  
13 most people and if you really believe something,  
14 that's how you're going to behave. If you really  
15 believe that management does not value safety in the  
16 organization, then you're going to exemplify that in  
17 your behavior in that organization. So we really do  
18 try to get at some of the attitudes and values as well  
19 as some of the other types of things that we've heard  
20 about today.

21 In addition, by having multiple methods,  
22 multiple tools, the bars, the survey, the interviews,  
23 the checklists, to asses the same behavior, we have  
24 something that we call convergent validity. And what  
25 that means is when we are doing an interview and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 asking questions about communication, we're not just  
2 going to use that information. We're also going to  
3 see if it's consistent with the data that we get from  
4 the survey, from the rating scales and from the  
5 checklists.

6 So in that sense now we have a multiple  
7 way to say communication is an issue for X, Y and Z  
8 reason baaed on multiple methods of assessment. So I  
9 think those are the two things that we look at a  
10 little bit differently from what I've heard. The  
11 convergent validity and the fact that we're looking at  
12 attitudes and values and perception in addition to  
13 some of the other types of information.

14 The tools allow for quantitative and  
15 qualitative. A survey will give you numerical values.  
16 Managers find it very useful to look at differences  
17 between departments or between levels in the  
18 organization, between management and non-management.  
19 But it also gives you qualitative data because I think  
20 we all know that the case studies and the examples are  
21 often very rich sources of information for these types  
22 of cultural characteristics.

23 Next slide, please.

24 (Slide change.)

25 MS. HABER: I just want to mention briefly

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 High Reliability organizations because it's a concept  
2 that is maybe not familiar to everybody, but when we  
3 were working on the USNRC research project, we worked  
4 with the University of California at Berkeley, Todd  
5 LaPorte, Gene Rocklin and Karlene Roberts. And many  
6 of you may know of their work. It's been published in  
7 popular as well as scientific journals. And really  
8 they talked about organizations that depend on human  
9 performance to avoid incidence involving significant  
10 adverse consequences in terms of employee and public  
11 health and safety. These organizations cannot afford  
12 to make a mistake because the consequence is too high  
13 if they make is. So that's what a high reliability  
14 organization is.

15 Just recently, last summer, Roberts and  
16 Bea came out in an Academy of Management article with  
17 an excellent framework for thinking about what makes  
18 a successful High Reliability organization. And I  
19 just want to give you the characteristics. I think  
20 they'll sound very familiar to you.

21 First one, please.

22 (Slide change.)

23 MS. HABER: The first is getting employees  
24 to buy into the big picture through consistent  
25 communication and teamwork to arrive at a common path

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 forward. People have to know what the vision is.  
2 They have to communicate by it. They have to talk  
3 about it amongst themselves and then you have to get  
4 them to work on a common path to achieve that mission.

5 Second, please. Next slide.

6 (Slide change.)

7 MS. HABER: Being a learning organization.  
8 And basically I heard a little bit discussion about  
9 what does that mean and why is that important. It's  
10 aggressively seeking to know what you don't know.  
11 Otherwise, you will never move and you never will be  
12 anticipating the next step or the next event.

13 And finally, the last one is using  
14 measurement to manage. We all know the term that  
15 whatever gets measured gets managed, but now you can  
16 build a reward and incentive system around it that  
17 recognizes that not only the cost of failure which  
18 we're often good at doing, but the benefit of  
19 reliability. And it's not just a compensation system,  
20 it's a whole social system that really recognized that  
21 reward. After all of their years of research from  
22 case study and analysis, they came up with these  
23 characteristics that they felt executives in these  
24 types of organizations would find very useful to think  
25 about.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           Culture is really the umbrella over these  
2 characteristics and really influences the  
3 implementation of how they are carried out. And high  
4 reliability organization, successful ones that do it  
5 well, place a very heavy emphasis on promoting a  
6 positive safety culture.

7           Next slide, please.

8           (Slide change.)

9           MEMBER APOSTOLAKIS: So is there an  
10 implication here that if I do these three bullets  
11 well, I will be a High Reliability organization? Or  
12 is it that if I am already an HRO, then these are  
13 three of my characteristics?

14          MS. HABER: They argue that to help  
15 promote being a successful HRO, this is what you  
16 should aim for.

17          MEMBER APOSTOLAKIS: But they don't  
18 provide any proof.

19          MS. HABER: Well, they provide some  
20 examples. And we'll talk about some of the behaviors.

21          MEMBER APOSTOLAKIS: Okay.

22          MS. HABER: Okay, we've heard a lot about  
23 the IAEA documents. Let me just quickly put it in  
24 perspective for how we've used it. The first, of  
25 course, is the INSAG-4 and I'm not going to go through

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 that again.

2 The second is that we also think about  
3 this in terms of safety culture existing in an  
4 organizational context. We heard this morning a lot  
5 about management and leadership and that's very  
6 important. And safety culture is very important on an  
7 individual level too, but it has to exist within the  
8 right organizational context. You can have an  
9 excellent leader and they're going to have a very  
10 tough time if there isn't the appropriate  
11 infrastructure and organizational processes for them  
12 to actually implement the visions and what they want  
13 to carry out. So we need to think about this, not  
14 only at the leadership issue, but also in the  
15 organizational context.

16 The IAEA uses Schein, and we heard Edgar  
17 Schein's model of culture and this is where we think  
18 that we're providing some information on the last  
19 bullet. The first two bullets we've heard about all  
20 day. Artifacts in Schein's model are the observables,  
21 the things that we can see; mission, a vision  
22 statement, a poster that's on the wall that we've  
23 talked about. Those are the observables, the  
24 artifacts.

25 The claimed values are what do we espouse

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 as an organization? Well, we hear safety first.  
2 That's a good one. We hear that safety is our top  
3 priority. These are all claimed values. I think all  
4 of us would agree that we're pretty successful at  
5 looking at these things and defining what they are.  
6 What we're least successful about, but probably the  
7 most important thing for culture are the basic  
8 assumptions. These are the attitudes and values that  
9 we all bring into work, to our families, to our  
10 societies, to our groups that really determine our  
11 behavior and in a working environment, those basic  
12 assumptions are going to impact performance,  
13 particularly safety performance. So when I think  
14 about it, we think about basic assumptions like safety  
15 can always be improved. In other words, if you come to  
16 work and you think that everything is okay and safety  
17 level in the organization is fine, then you're going  
18 to behave in a certain way. But if you're going to be  
19 on the lookout because you believe you can always make  
20 it a little bit better, then you're going to behave in  
21 a different way.

22 If we believe as human beings that all  
23 people are good, that's a basic assumption and we  
24 behave in a way, assuming that people are good. If we  
25 didn't believe that, we would behave differently. So

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 basic assumptions are really the values and attitudes  
2 that comprise a lot of culture. And it's the hardest  
3 thing to assess.

4 The IAEA also talks about the stages of  
5 safety culture development and I think from a  
6 regulatory spectrum, these are important. Compliance  
7 is a regulation-based safety culture. If the NRC says  
8 thou shalt have a positive safety culture, then the  
9 utility is going to go out and comply with that  
10 requirement. It's going to a compliance-based type of  
11 approach.

12 When they move into performance, what the  
13 organization is doing is now measuring, providing  
14 indicators or ways to look at safety culture. And I  
15 think we've heard some of that today. But the final  
16 one is when it becomes a process and it becomes a way  
17 of life or a way of working and it really is this  
18 notion that it can be improved and that it's always a  
19 continuous process.

20 Next slide.

21 (Slide change.)

22 MS. HABER: In December of this year,  
23 there was a consultancy in Vienna to try to take all  
24 of the information from the different INSAG documents  
25 that we've heard about. And by the way, George, I did

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 want to mention that there has been, I think this  
2 month, and there will be in the fall, meetings with  
3 regulators on these characteristics as well, to get  
4 that input.

5           We had a consultancy. We took together  
6 all these INSAG documents for 1315, 1329 tech doc.,  
7 all of them and said is there a way because the goal  
8 of the consultancy was how are we going to assess  
9 safety culture? If the IAEA wants to send out a  
10 safety culture assessment review team, SCWERT, then  
11 how are we going to do it. And one thing was we had  
12 to categorize these into something that made sense.  
13 And so what came out of that meeting were these five  
14 safety culture characteristics. They're now calling  
15 them dimensions. I've been calling them  
16 characteristics.

17           The first one, safety is a clearly  
18 recognized value in the organization. Now beneath  
19 each of these, I'm going to show you on the next chart  
20 are performance objectives and criteria that go with  
21 each of these characteristics and we still have to  
22 understand how we're going to measure them. Let's  
23 just go through these for a minute.

24           Accountability of safety in the  
25 organization is clear. Safety is integrated into all

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 activities. It's kind of the notion that it's all  
2 safety. It's not just nuclear safety and it's  
3 everywhere. A safety leadership process exists.  
4 Something we've heard a lot about today. And finally,  
5 that safety culture is learning driven, that the  
6 organization will use their own past performance and  
7 the experience of others to improve their own  
8 performance in the future.

9 Next slide.

10 (Slide change.)

11 MS. HABER: This is very busy. I'm not  
12 going to go through the whole thing, but I just want  
13 to show you how this framework is used in the  
14 methodology that we use to look at safety culture  
15 evaluation.

16 For those of you who have read the Davis-  
17 Besse report, some of this should be familiar to you.

18 Down the middle are the safety culture  
19 characteristics that we just spoke about, the five.  
20 Safety is a clearly recognized value, for example.  
21 Along here, are the performance objectives or if you  
22 want, the attributes of that characteristic. So you  
23 would look for documentation that describes the  
24 importance and role of safety, the value of safety is  
25 clearly transmitted and understood. Decision making

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 is conservative or reflects the value, etcetera and so  
2 forth. I'm not going to go through all of them.

3 We're still at the point of how do we get  
4 to the basic assumptions? I can show you the  
5 artifacts and the claimed values for these, the  
6 observables, but what about those values and  
7 attitudes? Well, along the right side you're going to  
8 see what we're calling organizational behaviors and  
9 these are the same organizational behaviors for the  
10 most part that we had identified back in the late  
11 1980s and early 1990s from the USNRC research that are  
12 used to assess those types of influences. And by  
13 using the different tools, we can get at not only the  
14 artifacts and the claimed values for those  
15 characteristics, but some of the basic assumptions,  
16 not all. I mean because that's very difficult.

17 But as an example, if we look at attention  
18 to safety, we have scales on our survey that have 40  
19 items that look at what is -- are these behaviors  
20 helping you to be successful in terms of performing  
21 safely in the plant? Okay? And so now you're getting  
22 at not whether or not it just exists or not, but what  
23 are employees', workers' perceptions about the  
24 importance of those particular behaviors. And you can  
25 compare between groups. So you can look at what

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 operations people feel, what maintenance people  
2 perceive, what engineering people perceive, what do  
3 senior managers perceive. They think it's there, but  
4 what about the maintenance technician who says no,  
5 it's not there. We don't have it and it's not helping  
6 me on my job. So you can look at those kinds of  
7 differences in a very quantitative and pretty graphic  
8 kind of way.

9 So I won't go through all of these, but  
10 basically we use these behaviors in assessing the  
11 characteristics, collecting them from the different  
12 tools and then being able to aggregate it up to make  
13 some statement about the absence or presence of these  
14 characteristics.

15 Last slide, please.

16 (Slide change.)

17 MS. HABER: I think from the experience  
18 that we've had and the work that we've done, we can  
19 say right now that safety culture attributes are  
20 definable and accessible. And we think and we believe  
21 and I think we've demonstrated that there are tools  
22 available for the diagnosis of the absence or presence  
23 of these attributes that are important to safety  
24 culture.

25 We found in some of our work that some of

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the behaviors that I showed you are more successful at  
2 differentiating between organizations. So we're  
3 attempting to look at what some behavioral indicators  
4 might be that would differentiate or discriminate  
5 between organizations.

6 We have a database now of over 20,000  
7 people that have responded to these tools and  
8 particularly the survey and we can delineate nuclear  
9 and non-nuclear. We can show differences there and  
10 even within nuclear, which I believe is probably not  
11 a wide, as wide a distribution as you might think, you  
12 can discriminate between different nuclear  
13 organizations as well.

14 And based on this kind of information,  
15 strategies can be implemented to really ensure  
16 alignment in an organization on these types of  
17 behaviors. I think something else that we heard a  
18 little bit about is what's the common mode and is  
19 there a common mode or is there a common mode failure?  
20 Well, when I think about our results and I see a lot  
21 of inconsistency or non-alignment in an organization,  
22 what we're really looking at in some sense is a common  
23 mode failure because the value of that organization  
24 have become really discrepant or not similar across  
25 the organization on behaviors that are all important

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 to safety culture.

2 And finally, I think that we talk a little  
3 bit about this, but I think that whatever the ACRS is  
4 going to recommend to the Commission, some criteria is  
5 going to have to be defined in terms of what the  
6 regulator expects from the licensee on safety culture  
7 and I think it might be better defined with a larger  
8 empirically generated database to look at the  
9 continuum of these characteristics across the  
10 industry.

11 Thank you. Any questions?

12 MEMBER APOSTOLAKIS: A quick one. As a  
13 regulator, why should I care about the basic  
14 assumptions? Shouldn't the artifacts be good enough  
15 for me?

16 MS. HABER: Because often the artifacts,  
17 in an organization that will not have a consistent or  
18 necessarily positive safety culture, the artifacts are  
19 not aligned with the basic assumption.

20 MEMBER APOSTOLAKIS: Yes, but my  
21 understanding of the artifacts is they are observable.

22 MS. HABER: Uh-huh.

23 MEMBER APOSTOLAKIS: If they are fine, I  
24 don't care. I don't care about the guy who has bad  
25 intentions, as long as he is doing the right thing.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 Because all I want to do is protect the public health  
2 and safety and that's what matters.

3 MS. HABER: But then you're looking --  
4 you're looking just at the outcome.

5 MEMBER APOSTOLAKIS: Yes.

6 MS. HABER: But often that is not a  
7 consistent outcome in an organization either.

8 MEMBER APOSTOLAKIS: So there may be  
9 another outcome later that may get me into trouble?

10 MS. HABER: Right, and part of that could  
11 be, if you want to understand why, then you need to  
12 understand the basic assumptions of why you might have  
13 had the discrepancy.

14 MEMBER POWERS: George doesn't care about  
15 understanding why.

16 MS. HABER: Well, you do care.

17 MEMBER APOSTOLAKIS: No, why? Don't take  
18 everything Dr. Powers says very seriously.

19 (Laughter.)

20 MR. GROBE: The artifact is the poster on  
21 the wall.

22 MEMBER ROSEN: Is that right or is that an  
23 outcome of an activity? I need a definition here.  
24 The artifact if it's just the poster we want, nuclear  
25 safety is our top priority and everybody has that and

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 you can find a nice colored poster, is that all you  
2 have to do?

3 MEMBER APOSTOLAKIS: I thought that thing  
4 on the wall is a claimed value.

5 MS. HABER: No, no, no. The artifact is  
6 a visible, observable -- it can be a behavior. Okay?

7 You might also have, George, a difference  
8 within the artifact. So you could see that you have  
9 the poster on the wall, but then the behavior in the  
10 organization doesn't match the poster on the wall.

11 MEMBER APOSTOLAKIS: Then I am interested.

12 MS. HABER: The artifact is a visible,  
13 observable, either behavior or -- concrete thing.

14 MEMBER APOSTOLAKIS: I dare say that most  
15 -- most plants have the same policy statements. They  
16 have the same -- all of them. So therefore, I would  
17 say those kind of artifacts right now are commonly  
18 used by everybody and yet, the behaviors are different  
19 from plant to plant.

20 MS. HABER: Well, you might think they're  
21 everywhere, but I think they're not always everywhere  
22 consistently and they're not always -- they're not  
23 always as obvious as you would think. I mean they  
24 might be on the wall. They might be outdated with the  
25 policy of the organization. So you might have an

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 artifact on the wall that describes some guiding  
2 principles, and if you read their actual procedures or  
3 their operating documentation, there's inconsistency  
4 between two artifacts.

5 MEMBER APOSTOLAKIS: What -- I mean, this  
6 particular model, it seems to me -- I agree, well, I  
7 agree. You just told me that artifacts may include  
8 actual behavior and also these things.

9 As a regulator, I'm really interested in  
10 the behavior. Now it seems to me that the one who  
11 should be interested in the assumptions is the  
12 utility. If the behavior is not appropriate or up to  
13 standards and so on, and they want to change it, they  
14 go and do this. But the NRC, we don't care. As long  
15 as your outcome is okay, because the trend now is to  
16 go to performance-based regulation. So if your  
17 performance is acceptable, I don't care how you got  
18 there.

19 MS. HABER: But if you're looking at -- I  
20 think I believe that the safety -- to understand the  
21 cultural aspects, you cannot just look at the  
22 artifacts and the claimed values. You're not really  
23 getting at --

24 MEMBER APOSTOLAKIS: And that's perfectly  
25 true.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MS. HABER: And what we're doing is trying  
2 to assess safety culture. As a regulator, if all you  
3 want to do is look at outcome --

4 MEMBER APOSTOLAKIS: Unless I have a big  
5 problem with the outcomes and then I want to go  
6 deeper. Use your other example. I mean you had  
7 plants where the artifacts and the claimed values were  
8 fine.

9 MEMBER APOSTOLAKIS: But the behavior may  
10 not be good.

11 MS. HABER: No.

12 CHAIRMAN BONACA: What is the consistency  
13 between the artifacts, the paper artifacts and the  
14 messages that management is sending to the people.  
15 For example, you may have all kinds of posters that  
16 says safety is number one. But then there are project  
17 meetings that last all day long and the first  
18 statement is safety is the most important thing. And  
19 then you don't talk about that any more. You talk  
20 about for eight hours about schedule and who's going  
21 to do what.

22 MS. HABER: That's right. Those are the  
23 inconsistencies that you would want to look for.

24 CHAIRMAN BONACA: Yes. And then, of  
25 course, the communications that are not artifacts.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 They are

2 -- well, actually they are --

3 MS. HABER: Performance objectives.

4 CHAIRMAN BONACA: Yes, there are the  
5 claimed values.

6 MS. HABER: Yes.

7 CHAIRMAN BONACA: And those will affect  
8 behavior ultimately.

9 MS. HABER: Yes, and that's all from what  
10 we find. And if you read the report that we wrote,  
11 there were many inconsistencies like that where the  
12 claimed value was one, but the observables were  
13 something else.

14 MEMBER APOSTOLAKIS: Are there any other  
15 questions or observations?

16 MEMBER POWERS: Just one question that I  
17 struggled with in looking at your report on  
18 Davis-Besse. In the course of reading -- well, it's  
19 going to turn out to be two questions, George, I'm  
20 sorry.

21 MEMBER APOSTOLAKIS: That's okay. As long  
22 as there are not three.

23 MEMBER POWERS: In the course of reading  
24 the report, you indicated that there was variability  
25 in the safety culture from organization to

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 organization. But when you came to the conclusions,  
2 you refer to condemning of the safety culture. And I  
3 was -- the question then came up, how do you  
4 characterize an institution with lots of sub-  
5 organizations within it and there's variability in  
6 their safety cultures? Did you take -- it didn't  
7 appear you were taking a mean. It looked as though  
8 perhaps you were emphasizing the worst of the safety  
9 cultures within the various organizations.

10 MS. HABER: The results that led to that  
11 really did come about from a lot of the survey data  
12 and differences between groups in the organization.  
13 Statistically significant differences at a very low  
14 probability level. So we were very convinced that  
15 they were real differences in combination with the  
16 interview results which also indicated those types of  
17 differences.

18 MEMBER POWERS: I'm operating a little bit  
19 from memory here, but when I read your conclusions you  
20 basically said they have a poor safety culture here.  
21 When I read the text, there are obviously some  
22 organizations within Davis-Besse that you thought had  
23 a pretty good safety culture and some that you thought  
24 had a bad one.

25 But when you came to the conclusion for

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 the institution as a whole you said it's bad. And I'm  
2 wondering is the appropriate way -- and maybe you were  
3 marching \* (6:05:21) and say look, tell me what the  
4 minimum is here or the mean or the mode. What are you  
5 telling me about it?

6 MS. HABER: What that report indicated was  
7 that there was a lot of, as you say, inconsistency or  
8 differences. Some groups, in fact, were much poorer  
9 than others.

10 Safety culture, one of the things we're  
11 talking about is a value that you want fairly  
12 homogeneously, maybe represented or exhibited  
13 differently by different departments because of the  
14 nature of their work. But you want people to be on  
15 the same page working towards that same goal of  
16 safety. And so in many cases we could not say the  
17 presence of one of those safety culture  
18 characteristics out of the five was clearly evident to  
19 us because of this consistency or inconsistency.

20 And so then we had to say that, in fact,  
21 those characteristics were not homogeneous or perhaps  
22 uniform throughout the organization.

23 MEMBER POWERS: The problem I have with  
24 that is they will never be uniform unless they're  
25 scripted. Now if I go through and say when she asked

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 you about this question on this, this is the right  
2 answer and if you don't give that answer you get  
3 fired. That's the only way I can get uniformity. So  
4 I --

5 MS. HABER: That's not true.

6 MEMBER POWERS: I will always have  
7 non-uniformity.

8 MS. HABER: We have data that demonstrates  
9 otherwise. We have data --

10 MEMBER POWERS: How can you possibly?

11 MS. HABER: We're talking about  
12 uniformity. We're talking in some statistical sense  
13 that we have groups that have significantly different  
14 scores on surveys or bars or whatever from each other.

15 We have other organizations, not Davis-  
16 Besse, where you don't see that type of inconsistency  
17 on those types of values and attitudes across your  
18 operations, maintenance or engineering groups.

19 MEMBER POWERS: I'm sure you do.

20 MS. HABER: They're not uniform, but  
21 they're not as different or as inconsistent.

22 MEMBER POWERS: I'm sure of that.

23 MS. HABER: Okay.

24 MEMBER POWERS: My average, if I randomly  
25 selected a plant, I will have a possibility of getting

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 one where there's total discordance from organization  
2 to organization. I have a possibility of getting  
3 there's total concordance, but in general, I will get  
4 some where there's a little bit of discrepancy between  
5 things.

6 So now how do I characterize -- I mean how  
7 do I add this together? Is it horrible when there's  
8 even a little bit of discordance or is it just kind of  
9 bad or undesirable? I mean I'm trying to understand  
10 the addition process here.

11 MS. HABER: From a quantitative sense,  
12 we've moved away from putting the numbers on it.

13 MEMBER POWERS: Well, you've definitely  
14 moved that. I will give you that. There are page  
15 numbers is what you have in your report.

16 MS. HABER: And I think it really is in  
17 that sense when we look in the organization, it's a  
18 profile of that organization within itself in terms of  
19 whether or not -- I mean it's an oxymoron to me to say  
20 that you have very different safety culture values  
21 within an organization.

22 I mean by definition then you don't have  
23 -- you may have them, but then you don't have  
24 necessarily the positive homogeneous type of culture  
25 that you would want to have.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. MEYERS: Can I comment on that? We  
2 worked hard on operations and engineering. We've  
3 really focused on them. There are maintenance guys  
4 who are walking around saying life is good. We don't  
5 have any problems. You know? We haven't really  
6 looked at maintenance too hard, right?

7 If you look at all the issues, none of  
8 them gets into maintenance too much. So we haven't  
9 done much in maintenance. What this told us, when we  
10 looked at it is, we need to focus on our maintenance  
11 groups a little bit, you know?

12 MEMBER POWERS: I'm sure of that. I'm  
13 just asking a mechanics question.

14 Let me ask another mechanics question. I  
15 was struck in your methodologies that you've advanced  
16 on the extensive use of interviews. You talk to  
17 people.

18 MEMBER ROSEN: Goodness, you talk to  
19 people.

20 MEMBER POWERS: But you're asking them to  
21 get some assessment on their views about something  
22 where you're testing their religious fervor on things.  
23 And the problem is that people use words in different  
24 ways. And you have a set of words that you're looking  
25 for and I'm wondering do you run into a problem and as

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 an example, I'm married to this girl from California  
2 that is truthfully laid back and the best thing she  
3 ever experienced in her life she'll say it's pretty  
4 good. Okay? And the worse thing she ever experienced  
5 in life she said no, I didn't like that much. In  
6 other words, there are no extremes in her response to  
7 your questions. Okay?

8           Whereas, I can also find people who are  
9 very excitable like Mr. Shack here who the slightest  
10 discrepancy between his aspirations he is convinced  
11 it's like the end of the world in the language he  
12 uses.

13           (Laughter.)

14           Do you run into a problem with that? The  
15 words people use are just different.

16           MS. HABER: What I haven't had time to go  
17 into is the integration and the aggregation of the  
18 data. When you talk about the interview data, we do  
19 a lot of interviews because no result comes forth that  
20 isn't heard consistently or repetitively across the  
21 organization. So one individual's description or one  
22 individual's word, if you will, that might be a little  
23 bit different, we're not looking for a particular  
24 word, we're looking for the concept and the  
25 understanding and the perception of the person.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1           If we would only get one on that end of  
2           the distribution, you didn't see that in the report.  
3           So there's a very laborious process that we go through  
4           to make sure that they are aggregated from -- and not  
5           only the interviews, but then we also have to have  
6           consistency from the survey data which is more  
7           quantitative and the bars and the checklists. So the  
8           conclusions that you read at that point really  
9           represent a lot of methods, a lot of data that's gone  
10          into that.

11                   MEMBER POWERS: At the risk of incurring  
12          Mr. Apostolakis' wrath, I'll ask you a third question.

13                   MEMBER APOSTOLAKIS: I'm not easily  
14          excitable like Mr. Shack.

15                   MEMBER POWERS: I know, you're a laid back  
16          Californian, transplanted to Boston. I understand,  
17          George.

18                   In a misspent youth, I got associated with  
19          employee opinion surveys and one of the things that I  
20          learned about those surveys is you survey people about  
21          the opinion of the organizations and they tell you  
22          what you're doing good and what you're doing bad. And  
23          people having the survey done will find these things  
24          they do bad and they'll work very hard to change them.  
25          And having done that they'll give a survey again. And

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 almost universally, their scores will go down. It's  
2 called a statement effect. And do we have that  
3 problem with surveys?

4 MS. HABER: No. We've done these again.  
5 Not at Davis-Besse right now, but at other  
6 organizations and then we've done them because the  
7 organization has wanted to do an intervention to try  
8 to fix a particular problem maybe in the communication  
9 area, asked us to come back in.

10 The key to that issue which is documented  
11 in the literature is how much time you wait between  
12 when you do the first assessment and the second  
13 assessment.

14 Typically, depending upon the behavior -- I mean  
15 culture becomes something, as we've talked about  
16 before, doesn't change very quickly. But things like  
17 communication, attributes of communication can change  
18 quicker if you're doing some focused intervention.

19 If we went back about 18 to 24 months  
20 later, and then you can assess even degradation or  
21 improvement or stability, I mean you can get any  
22 combination of those. So I'd still say, I mean, I  
23 understand the issue. If it's a well-designed  
24 questionnaire, you will minimize that effect. You'll  
25 minimize the sabotage effect. You'll minimize the

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 repetitive effect.

2 And I think the reason that we feel  
3 comfortable to use it is because we have the other  
4 tools as well, that will either validate or not the  
5 results that we get from one tool.

6 MEMBER POWERS: I've got more questions,  
7 but you threatened me at three.

8 MEMBER APOSTOLAKIS: Three is good enough,  
9 Dana, unless you have something that's really burning.

10 MEMBER POWERS: Well, the next question is  
11 suppose that we said okay, we'll require people to  
12 assess the safety culture and use that as an indicator  
13 and the licensee -- that's done, okay? And the NRC  
14 comes in and said gee, your indicator is too damn low.  
15 And so we're going to take you and give you fuschia as  
16 a color. And we'll take fuschia as bad.

17 And this goes to the significance  
18 determination process. So the licensee then brings in  
19 somebody other than Sonja, somebody else as a company  
20 who says they can assess safety culture and comes  
21 back, will they come up with the same result using  
22 presumably different tools?

23 MEMBER APOSTOLAKIS: There is obviously  
24 more than uncertainty here. That's what you're  
25 saying.

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER POWERS: Yes.

2 MEMBER APOSTOLAKIS: And I don't think  
3 Sonja denies the fact that there is a lot of  
4 subjective evaluation and in fact, what we're hearing  
5 from the industry, the way I understand is that they  
6 are reluctant to have an overall rating of safety  
7 culture. They would rather talk about specific  
8 attributes and try to improve them.

9 Bill O'Connor did not go to any integrated  
10 assessment and maybe that's why they are trying to  
11 avoid. But there is definitely more than uncertainty  
12 here. My goodness.

13 MEMBER POWERS: In fact, if the greatest  
14 difficulty we have right now with the STP is that a  
15 finding is made, a color is assigned -- I get my  
16 phases wrong here all the time. Phase 2, and it goes  
17 into a comparison and you don't get the same results  
18 coming out of that, I mean it looks like we're begging  
19 for that kind of problem here and there's tremendous  
20 modelings here.

21 MR. MEYERS: Does anything matter? You  
22 talk about our report. We were pretty happy with our  
23 report. We thought it validated and believed it to be  
24 true already. The key is you have management buy in  
25 --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MEMBER POWERS: That concern was primarily  
2 one of mechanics of doing --

3 MR. MEYERS: My point is when you get  
4 through with one, what you have got to have is the  
5 management buy in that you believe those factors are  
6 true and you're going to go do something about them.  
7 Without that buy in, the survey doesn't do you any  
8 good. None of that stuff does you any good. You got  
9 to buy in because we said all along is that safety  
10 culture is leadership driven, right?

11 MEMBER POWERS: It has been said all day.  
12 If you're asking me to say it, no, I won't say it.  
13 Because I don't think it is.

14 MEMBER APOSTOLAKIS: Any other comments.

15 MEMBER RANSOM: Just a very quick  
16 comments. It seems to me in the last 40 years in this  
17 country, we've gone through management by objective,  
18 management by commitment, total quality management,  
19 six sigma programs, and from my experience in some of  
20 these it seems like fatigue sets into an organization  
21 where they say well, here's just another program. If  
22 we just sort of hang back and it will go away and wait  
23 for the next one. And as I've listened to a lot of  
24 this Davis-Besse situation, I can imagine the people  
25 there feeling somewhat -- oh my God, here's another

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701



1 program. And I don't know, do you, from a  
2 psychological perspective, see that?

3 I know that I've heard that in  
4 organizations that change the organization frequently.  
5 People after a while say well, okay, I'll just wait  
6 for the next organization and see if I can position  
7 myself so I'm in a better spot the next time they  
8 change the organization. And it really cuts into  
9 productivity and actual performance.

10 MS. HABER: We don't have to go too far to  
11 look at it. Doesn't it happen in our own government  
12 institutions?

13 (Laughter.)

14 MEMBER SIEBER: Yes, but that's not a good  
15 example.

16 (Laughter.)

17 MS. HABER: It's the flavor of the month  
18 and it's the way you see attitude of like what are  
19 they going to do now and how is that going to work?

20 MEMBER RANSOM: In my observation, it  
21 seems to me the organizations that have been  
22 successful are the ones that have had a history of  
23 stable organization, respect for their employees and  
24 the employees buy into the organization and become a  
25 part of it. They're more fraternal, more or less, or

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 paternal.

2 MS. HABER: And you're right, but you can  
3 manage change successfully and make that transition  
4 more successful than uncertain.

5 MEMBER RANSOM: It seems to me you have to  
6 be very careful to make it believable.

7 MS. HABER: Yes.

8 MEMBER ROSEN: But Vic, there's a piece  
9 that you didn't talk about and that is the new leader,  
10 when he comes in, has to provide the incentive for the  
11 people in the organization to want to have the change  
12 and have it be successful. And that's what -- Lew,  
13 you and I saw that. The burning platform speech where  
14 the CEO comes in and says imagine you're on a burning  
15 oil platform out on the ocean, we're all going to die  
16 unless we get together and fight the fire and put it  
17 out, pretty soon.

18 CHAIRMAN BONACA: That's when you have a  
19 change in management to deal with the problem. I  
20 agree with that. There is one thing to say, however,  
21 in favor of the newcomer, if he's given the resources  
22 that the previous organization did not spend, that's  
23 really a fundamental difference. Before you had an  
24 organization that had a mandate from the top down  
25 that, for example, you shall not spend the money

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 because this company already spends too much money.  
2 Now then the whole organization goes down the drain.  
3 The saviors come in and they're given tons of money to  
4 fix everything. So now then all this fixing really  
5 translates into also behavioral attitudes on the part  
6 of management because now they want to have people  
7 supporting that and so you have the transformation.

8 I think a bigger issue is given that you  
9 have a stable organization there, like we had at  
10 Davis-Besse, how does the organization assess itself?  
11 How does it measure, in fact, that maybe there is a  
12 degrading culture and is willing to cope with that  
13 which means to resolve the issues and to bring it --  
14 that, I think is a fairer assessment of what we have  
15 to look at. Also because I think, in general, we have  
16 power plants right now that are performing pretty  
17 well. What we're trying to do is to prevent  
18 degradation, in fact, of performance in the future.  
19 So I would really look at that as a model that we have  
20 to address.

21 MR. GROBE: I think there's two parts to  
22 that. One is how does it assess itself and how does  
23 it benchmark itself such as it's confident, that its  
24 self-assessment aren't deceiving.

25 CHAIRMAN BONACA: Yes, but it seems to me

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 what it comes down to monetary, really that's an  
2 industry responsibility and that's why -- this is just  
3 a personal opinion. I see a significant role for  
4 INPO.

5           However, it seems to me that the NRC still  
6 has the need to recognize the symptoms of poor safety  
7 culture, even if we did not regulate anything. There  
8 is a need for inspectors to recognize safety culture.  
9 Now we can say the inspector is doing his best and I  
10 agree with that, but we all recognize that people have  
11 to be trained. They have to be able to recognize  
12 symptoms, and particularly, I feel that the  
13 inspectors, for example, have a huge challenge because  
14 they are isolated within the organization. It's very  
15 hard to stay isolated, particularly if you become part  
16 of the organization, even if you are a regulator.

17           It's very hard to sit in a place like a  
18 power plant and to maintain a judgmental perspective  
19 on everybody who is around you. It's almost an  
20 impossible thing. So that behaviorally, I think, is  
21 a huge challenge. It's very hard for any individual  
22 to live that way and how do we -- I know the NRC  
23 recognizes that problem, the challenge. But how do we  
24 make the inspectors more capable of recognizing  
25 symptoms? Can we help them somehow?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MR. GROBE: I think we have to set that  
2 expectation, provide training and then to address your  
3 other concern of what we call loss of objectivity, we  
4 have a number of coping strategies. We assign at  
5 least two inspectors per site to ensure that there's  
6 somebody that they can benchmark themselves off of.  
7 We rotate inspectors on a regular basis. We don't  
8 allow people to become permanent fixtures at a  
9 facility. The different regions have different  
10 frequencies of -- different data regarding how  
11 frequent people rotate. Lots of times it depends on  
12 promotions and things like that.

13 But it's frequently on the 3 to 5 year  
14 range. There's a limit of 7 years. So these issues  
15 are -- we try to deal with these issues. How  
16 effective we are is another story. I think we're  
17 pretty effective.

18 MEMBER APOSTOLAKIS: Tom?

19 MEMBER KRESS: I'm interested in just how  
20 intrusive you're making the methodology might be, for  
21 example, how many people do you interview, how do you  
22 choose people to interview, how much time do you spend  
23 with them and what's the overall time that you're at  
24 the plant, that sort of thing. Just give me an idea  
25 of what --

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MS. HABER: Well, at Davis-Besse, it's in  
2 the report, but we interviewed -- we requested 96  
3 people.

4 MEMBER KRESS: Do you decide which people  
5 you wanted to talk to?

6 MS. HABER: We do it by functional  
7 positions, not by individual names. So we'll say we  
8 want to talk to three or four maintenance technicians  
9 or three or four reactor operators.

10 MEMBER KRESS: And then the management  
11 decides which ones to send you?

12 MS. HABER: They said that they did it  
13 randomly through Human Resources by -- every  
14 organization has a different way to do it. We  
15 surveyed 100 percent of the population and we got  
16 close to 80 percent response rate of all the employees  
17 took the paper and pencil questionnaire, which is a  
18 very acceptable response rate.

19 We observed over 50 different types of  
20 activities. We were at the site for two weeks.  
21 actually a little less than two weeks. We were a team  
22 of four people.

23 MEMBER KRESS: That helps me.

24 MEMBER APOSTOLAKIS: One last question, if  
25 you are talking about leadership, which leadership?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 Site leadership, corporate leadership, board of  
2 directors? Who is the leadership here?

3 MS. HABER: Well, from our perspective, if  
4 you look at the characteristic that says leadership  
5 process, it's at all levels and it even includes the  
6 informal leaders of the organization. So you have the  
7 formal leaders at all your levels of the organization,  
8 but you also have informal leaders, perhaps people  
9 from bargaining units or people from certain groups  
10 and you have to look at them and how they can  
11 influence the culture and be into the --

12 MEMBER APOSTOLAKIS: But you don't  
13 interview those guys, do you?

14 MS. HABER: Sure we do. Absolutely.

15 MEMBER APOSTOLAKIS: Like who? Who's the  
16 highest ranked --

17 MS. HABER: The president of a local  
18 union.

19 MEMBER APOSTOLAKIS: Oh, the stakeholders.

20 MS. HABER: No, not a stakeholder. He's  
21 a worker. He might be president of the local chapter  
22 and he's a maintenance mechanic, absolutely.

23 MEMBER APOSTOLAKIS: Within the  
24 organization, what was the highest ranking person that  
25 you interviewed?

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701

1 MS. HABER: We went to FENOC and we  
2 interviewed Peter Berg at First Energy. I don't think  
3 we can go any higher than that, in that company.

4 MEMBER APOSTOLAKIS: Okay, I think we  
5 should close this. Thank you very much, all of you.  
6 It was very informative.

7 The idea was to take a break and come back  
8 to go around the table, but I think it's getting too  
9 late.

10 MEMBER SIEBER: You could try to give us  
11 a break.

12 MEMBER APOSTOLAKIS: It's up to you, Mr.  
13 Chairman.

14 CHAIRMAN BONACA: I think we can take a  
15 little break and then just come back for 15 minutes  
16 around the table. Off the record.

17 MEMBER APOSTOLAKIS: Do you want to do  
18 that?

19 CHAIRMAN BONACA: We're going to go off  
20 the record now and certainly we want to thank all of  
21 you for your participation. I think it's been great.

22 (Whereupon, at 6:27 p.m., the meeting was  
23 concluded.)

24

25

**NEAL R. GROSS**

COURT REPORTERS AND TRANSCRIBERS  
1323 RHODE ISLAND AVE., N.W.  
WASHINGTON, D.C. 20005-3701