

**NUCLEAR REGULATORY COMMISSION**

**ORIGINAL**

Title: Advisory Committee on Reactor Safeguards  
Plant Operations Subcommittee

PROCESS USING ADAMS  
TEMPLATE: ACRS/ACNW-005

Docket Number: (not applicable)

Location: Rockville, Maryland

Date: Wednesday, May 9, 2001

Work Order No.: NRC-203

Pages 1-257

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
PLANT OPERATIONS SUBCOMMITTEE

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WEDNESDAY,

MAY 9, 2001

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory  
Commission, Two White Flint North, Room T233, 11545  
Rockville Pike, at 8:30 a.m., John D. Sieber,  
Chairman, presiding.

COMMITTEE MEMBERS

JOHN D. SIEBER, CHAIRMAN

GEORGE E. APOSTOLAKIS, MEMBER

MARIO V. BONACA, MEMBER

THOMAS S. KRESS, MEMBER

GRAHAM M. LEITCH, MEMBER

WILLIAM J. SHACK, MEMBER

ROBERT E. UHRIG, MEMBER

GRAHAM M. WALLIS, MEMBER

MAGGALEAN W. WESTON, STAFF ENGINEER

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1     STAFF PRESENT:

2     DAVID ALLSOPP, IIPB/DIPM

3     TOM BOYCE, NRR/DIPM/IIPB

4     EUGENE COBEY, NRR/DIPM

5     DOUG COE, NRR

6     A. EL-BANIONI, NRR/DIPM/SPSB

7     JOHN HANNON, SPLB/DSSA

8     DON HICKMAN, IIPB/DIPM

9     J.S. HYSLOP, NRR/SPSB

10    JEFF JACKSON

11    MICHAEL JOHNSON, IIPB/DIPM

12    PETER KOLTAY, NRC DIPM

13    ALAN MADISON, NRR/IIPB

14    GARETT PARRY, NRR/DSSA

15    PHIL QUALLS, NRR/DSSA/SPLB

16    MARK SALLEY, NRR/DSSA/SPLB

17    MARK STORIUM, NRR/DIPM

18    STEVEN STEIN, NRR/DIPM

19    JOHN THOMPSON, NRR/DIPM

20    LEON WHITNEY, NRR/DIPM/IIPB

21    PETER WILSON SPSB/DSSA

22    SEE-MENG WONG, NRR/ADIP

23

24

25

## A-G-E-N-D-A

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

(8:30 a.m.)

CHAIRMAN SIEBER: The meeting will now come to order. This is a meeting of the ACRS Subcommittee on Plant Operations. I am John Sieber, Chairman of the Subcommittee.

ACRS members in attendance are Dr. George Apostolakis, Dr. Mario Bonaca, Dr. Peter Ford, Dr. Thomas Kress, Mr. Graham Leitch, Dr. William Shack, and Dr. Robert Uhrig.

The purpose of this meeting is to discuss the reactor oversight process, which today will include the significance determination process and performance indicators. The action matrix will be discussed at our next meeting in July.

We had our last subcommittee meeting with the staff on oversight processes on December 6th of last year. Maggalean W. Weston is the cognizant ACRS Staff Engineer for this meeting.

The rules for participation in today's meeting have been announced as part of the notice of this meeting published in *The Federal Register* on April 16th, 2001.

A transcript of the meeting is being kept and will be made available as stated in *The Federal*

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1 Register notice.

2 It is requested that speakers first  
3 identify themselves and speak with sufficient clarity  
4 and volume so that they can be readily heard. I also  
5 request that all speakers please use the microphones  
6 to aid the court reporter.

7 We have received no written comments from  
8 members of the public regarding today's meeting. I  
9 think we should now proceed with the meeting. Mr.  
10 Mike Johnson of NRR will introduce the topic and the  
11 presenters. Mike?

12 MR. JOHNSON: Good morning. Thank you.  
13 I am -- my name is Michael Johnson from the Inspection  
14 Program Branch. I'm joined at the table by Doug Coe,  
15 who is also from the Inspection Program Branch. He is  
16 the Chief of the Inspection Program Section.

17 And as was indicated, we have a variety of  
18 topics to talk about this afternoon -- I'm sorry, this  
19 morning, and spilling over into this afternoon. And  
20 there will be a bunch of additional participants,  
21 including representatives from the Plant Systems  
22 Branch.

23 I've got John Hannon, who is the Branch  
24 Chief of the Plant Systems Branch; J.S. Hyslop and  
25 Mark Salley, who will be talking about specific issues

1 of interest to the ACRS and the significance  
2 determination process, and other participants.

3 So, you'll see participants cycle in and  
4 out for efficiency purposes throughout the  
5 presentation this morning and, again, into this  
6 afternoon.

7 As was indicated, today's briefing really  
8 does focus on the SDP and the performance indicators.  
9 This is, again, a continuation in a series of  
10 presentations that we've had, the last one being in  
11 December where we specifically talked about issues  
12 relating to the SDP and performance indicators.

13 We appreciate the opportunity to talk to  
14 -- talk to ACRS on an ongoing basis on these and other  
15 issues. We have, in the past, benefited from these  
16 exchanged.

17 And, in fact, in preparing for today's  
18 presentation, I read over the transcript from our last  
19 meeting, and we talked about many of the issues, I  
20 think, that are on ACRS's mind with respect to the  
21 ROP. And we'll continue dialogue on those very issues  
22 today.

23 So, it's been a fruitful -- a fruitful  
24 exchange for us. And we know that this fits into your  
25 schedule -- this meeting today fits into your

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1 schedule, along with a presentation, I guess, in July  
2 -- Mag, is that correct --

3 MR. JOHNSON: Yes.

4 MR. JOHNSON: -- to talk about the action  
5 matrix and getting ready for September's session with  
6 the committee in preparation for your letter to the  
7 Commission on the ROP. And so, we're happy, again, to  
8 be in front of the ACRS to talk about these various  
9 issues.

10 In preparing for today's presentation, we  
11 provided background materials. One of the primary  
12 background materials are SECY-99-007, or excerpts from  
13 SECY-99-007, that provide a lot of the basic  
14 information for the concept of the ROP. And we've  
15 talked about many of those issues many times with the  
16 ACRS.

17 In addition, Inspection Manual Chapter  
18 0609, which is our manual chapter that talks about the  
19 significance determination process, was provided. And  
20 we'll spend, again, a good portion of what we do today  
21 talking about and responding to questions on the  
22 significance determination process.

23 We were able to work closely with Mag, I  
24 think, to understand what the issues were that you  
25 wanted us to cover. Hopefully, we've been able to



1 factor those into our presentation. And I know to the  
2 extent we haven't been able to, you won't be shy in  
3 getting us to address the issues that you care about.

4 Today -- next slide, Doug -- we're going  
5 to really focus on four, specific things. First of  
6 all, I want to just say a few words about the initial  
7 implementation status, and that is, that overall  
8 result of the ROP to date, to bring you up to speed  
9 with respect to where we are.

10 Then, after that, we will get directly,  
11 again, into the significance determination process.  
12 We've got a series of examples that we want to go  
13 through with you to help you better understand the  
14 significance determination process and how it is being  
15 implemented.

16 And in addition to some examples in the  
17 reactor safety area that Doug is going to talk about,  
18 we specifically will cover some fire protection -- the  
19 area of fire protection, the fire protection SDP, and  
20 an example in that area, again to help the ACRS better  
21 understand how we're implementing the significance  
22 determination process.

23 Following that, we have a topic on  
24 performance indicators, again to respond to your  
25 questions on performance indicators and the issues,

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1 again to continue the dialogue on issues that we've  
2 talked about with respect to performance indicators  
3 and respond to your questions.

4 And finally, we want to wrap up with some  
5 -- we call them selective issues, but they really are  
6 overall topics, if you will, that don't relate  
7 necessarily to the individual topics that we would  
8 have hit in getting there; so, again, an agenda, I  
9 think, that responds to the questions that we know  
10 you're interested in.

11 Next slide. Let me just say a couple of  
12 words about the overall results. We are -- we have  
13 wrapped up the first year -- or, I should say, are  
14 wrapping up the first year of implementation of the  
15 ROP.

16 Last week, as a matter of fact, Regions 2  
17 and Regions 3 -- Region 3 conducted their end-of-cycle  
18 reviews. The end-of-cycle is the review that happens  
19 at the end of the assessment year in which the regions  
20 look at what has gone on in that year with respect to  
21 the performance indicator results, the trip  
22 thresholds, and the inspection findings of the trip  
23 thresholds in terms of looking at, again, what actions  
24 the Agency took in accordance with the action matrix  
25 and getting ready for issuance of the annual

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1 assessment letter that provides to the licensees and  
2 to other external stakeholders the results of the  
3 oversight process for that particular year.

4 Following the end-of-cycle, there will be  
5 an Agency action review meeting. And just to put this  
6 -- the Agency action review meeting in context, think  
7 of the Agency action review meeting as a revamped  
8 senior management meeting.

9 Again, it is the meeting of senior  
10 managers somewhat different from the previous process  
11 in that this meeting really is an opportunity for  
12 senior managers to review and provide an affirmation,  
13 if you will, of the results of the ROP with respect to  
14 plants that ended up with significant performance  
15 problems, and that means, for us, plants that ended up  
16 in the action matrix in the multiple repetitive  
17 degradative cornerstone. So, these are plants that  
18 have really had some performance issues.

19 But secondly, in the Agency action review  
20 meeting, we talk about industry trends, and what have  
21 industry -- what has industry trends told us about  
22 whether we've been able to maintain safety.

23 And finally, we look at self-assessment  
24 results -- the results of self-assessment for the  
25 first year of implementation, and what are the lessons

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1 that we've learned, and what is the feedback that  
2 we've gotten from stakeholders, and what changes do we  
3 need to make to the process based on those? So,  
4 that's where we are in the process.

5 MR. LEITCH: Could you say again what you  
6 call that meeting?

7 MR. JOHNSON: That is called the Agency  
8 action review meeting, the AARM, the Agency action  
9 review meeting.

10 MR. LEITCH: Thank you.

11 MR. JOHNSON: We believe that we've  
12 substantially exercised the ROP during the first year  
13 of implementation. If you were to look at the action  
14 matrix in terms of where plants fall in the various  
15 columns of the action matrix, we had a number of  
16 plants, a majority of plants, in the licensing  
17 response band.

18 We had plants that ended up in in the  
19 regulatory response band. We ended up having plants  
20 that were at degradative cornerstones. That is a  
21 further degradation of performance. And in fact, we  
22 had a plant -- a plant IPS, Indian Point 2, that ended  
23 up in the multiple repetitive degradative cornerstone.

24 That has enabled us, because of those  
25 cross thresholds, be able to exercise all of the

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1 supplemental inspection procedures. We've been able  
2 to do all of -- to do our event follow-up procedures.  
3 I almost said "all of our event follow-up procedures,"  
4 but I stopped myself, Doug, because we didn't have an  
5 IIT, thank goodness.

6 But we've got -- we've had a wide range of  
7 performance, and therefore, a number of opportunities  
8 to exercise many aspects of the ROP. And we think  
9 that's been a good thing.

10 We've made several significant changes  
11 based on lessons learned to date where we found what  
12 we believe were flaws that needed to be corrected that  
13 we couldn't wait on.

14 But our intent in going into the first  
15 year of initial implementation was to try to maintain  
16 the process stable, if you will. And so, we held off  
17 making wholesale changes until the end of the year  
18 where we could do a more considered self-assessment on  
19 what changes we needed to make.

20 And you'll see those changes talked about  
21 -- being talked about in a Commission paper at the end  
22 of the year. And again, this will be talked about at  
23 the Agency action review meeting, and we'll brief the  
24 Commission on those results in July. 1

25 DR. APOSTOLAKIS: But you'll talk about

1       them today as well?

2               MR. JOHNSON: I would suggest that we talk  
3       about them maybe in the meeting in July. We'll be  
4       closer -- we'll have a better opportunity to have done  
5       the roll-up of self-assessment activities.

6               We'll be closer to the Commission  
7       briefing, and we can give you a better idea of what  
8       we'll be telling the Commission.

9               Finally, we believe that -- and we'll --  
10       I'll just remind you that we've talked all along about  
11       establishing some objectives for the ROP. And you're  
12       well aware of those because you helped us form those.

13               We wanted this process to be more  
14       objective, for example, to be more understandable and  
15       predictable. And we think that the process has, in  
16       fact -- is more objective, and more understandable,  
17       and more predictable, and the other attributes that  
18       we're measuring with respect to the fundamental  
19       objectives of the process.

20               And we base that on some of the data that  
21       we've collected with respect to the matrix. We base  
22       that on the feedback that we've gotten from internal  
23       stakeholders, and the feedback that we've gotten from  
24       external stakeholders.

25               We do continue, again, to collect data on

1 the ROP. We have a set of matrix, if you will, with  
2 criteria associated with those matrix in some cases to  
3 enable us to draw some objective conclusions with  
4 respect to how well the ROP is meeting its intended  
5 goals.

6 And we'll continue to collect that data  
7 and make decisions based on the effectiveness of the  
8 ROP and to indicate -- implement changes based on what  
9 that tells us as we go forward.

10 So, those are the overall results of the  
11 first year of implementation. And again, we think  
12 we've made a fair amount of progress with respect to  
13 implementing the ROP.

14 DR. APOSTOLAKIS: Now, it says there on  
15 the fourth bullet, "successful demonstration." I  
16 wonder what the measures of success were. I mean,  
17 what -- what could have happened that would have you  
18 made you declare it unsuccessful?

19 MR. JOHNSON: We have -- that's a good  
20 question. We have -- but it's not one, George, I  
21 think you want me to answer today because that would  
22 take us -- and I think the question goes to the self-  
23 assessment process and the matrix that we've  
24 established, and measure the goals of the ROP.

25 We have established those matrix. For

1 example, with respect to the process being  
2 predictable, we measure things like did we -- did we  
3 implement the procedures in accordance with the  
4 criteria established for them?

5 So, there are various criteria we've  
6 established, various matrix to identify each of the  
7 various goals. And what I would suggest, again, is  
8 that in that briefing that we do in the next meeting  
9 in July, that we come back and talk to you a little  
10 bit about what those self-assessment measures have  
11 told us about the various --

12 DR. APOSTOLAKIS: But the ultimate goal of  
13 this is to make decisions. So, without getting into  
14 details, have you made any decisions using this  
15 process that would have been different if the old one  
16 had been followed?

17 MR. JOHNSON: Have we --

18 DR. APOSTOLAKIS: I mean, is the new  
19 process leading to more rational decisions, or better  
20 decisions, or decisions that make the stakeholders  
21 better -- I mean, happier?

22 MR. JOHNSON: Yeah, we --

23 DR. APOSTOLAKIS: Isn't that the ultimate  
24 criteria?

25 MR. JOHNSON: Yeah. In general, we have



1 a -- we have a good sense of comfort with respect to  
2 the ROP in its overall ability to achieve the  
3 objectives that we set out for it.

4 So now, all I'm suggesting is I can't --  
5 I can't show you the matrix that enabled us to get  
6 there. In fact, we're still evaluating those matrix  
7 because, again, the year just ended.

8 But yeah, we believe that the process is  
9 -- has been more objective, is more understandable.  
10 We've gotten specific feedback that says that the  
11 process is more understandable.

12 The external stakeholders tell us the  
13 process is more understandable. The internal  
14 stakeholders tell us the process is more  
15 understandable.

16 So, yeah, we believe that the process,  
17 again, at a high level, achieves its objectives. Now,  
18 I've got to caveat that -- and that's why I want to  
19 have this conversation again in July -- with several  
20 things.

21 First of all, it is early. We're still  
22 analyzing the data. Secondly, for some of the matrix,  
23 because the matrix are new, it's hard to make a call  
24 on things like -- one of the things that we're going  
25 to measure, for example, with respect to measuring

1 whether the program meets the NRC's performance  
2 objectives, is does the program increase or enhance  
3 public confidence?

4 Well, that's a tough measure. We've  
5 gotten some ways that we're going to try to measure  
6 that. We've gotten some early bench-marking results,  
7 if you will. But it will take a year, or a couple of  
8 years maybe, before we can have some strong  
9 conclusions with respect to whether it does that.

10 So, again, what I'd like to do is to come  
11 back to you and talk about the self-assessment process  
12 a little bit and the results.

13 CHAIRMAN SIEBER: I think one of the  
14 aspects that licensees look at, which I think is  
15 important and you ought to evaluated, is whether the  
16 licensees perceive the process as being fair.

17 You know, there were some times, years  
18 ago, that perhaps some enforcement action was  
19 interpreted as not as fair as it could have been.

20 And it seems to me, with the structure  
21 that you've developed here, that the chances and the  
22 opportunities to be fair are much enhanced over what  
23 they have been in the past. But I think you ought to  
24 look at that process.

25 And I guess another question that I have,

1 which is really a follow-on to George's question, is  
2 are you making more decisions or less decisions, given  
3 the state of the industry, with the new process, as  
4 opposed to what you would have done under the old  
5 process?

6 MR. JOHNSON: Okay.

7 CHAIRMAN SIEBER: Go ahead.

8 MR. JOHNSON: We might -- we might  
9 actually get into -- give you a better sense as to  
10 whether we're making more decisions or taking more  
11 actions as we go through -- as you see the SDP  
12 exercise, for example. We'll tell you how we come out  
13 on issues.

14 And we'll try to -- we'll try to give you  
15 a sense for what -- how the -- how the old program  
16 might have dealt with those issues, to the extent  
17 we're able to.

18 But in general, we've established, in this  
19 ROP, what is a -- what is called a licensee response  
20 band. And that means that we've come to the  
21 recognition and the realization that there is a level  
22 of performance and there is a level of performance  
23 degradation at a very, very low level that really  
24 falls within the responsibility of the licensee to  
25 correct.

1           So, and that's different from the old  
2 process. In the old process, we would have engaged,  
3 perhaps, on issues that fell within that level.

4           CHAIRMAN SIEBER: That's right.

5           MR. JOHNSON: Under this process, we set  
6 aside those that are in the licensee response band.  
7 So, intuitively, the answer is that we make -- there  
8 are fewer interactions.

9           DR. FORD: Mike, I have an even more basic  
10 question. I'm new to this, and I'm trying to learn.  
11 Can you tell me, in two sentences or three sentences,  
12 basically what this is all about? Are you trying to  
13 be proactive? Are you trying to reduce bureaucracy?  
14 What are you trying to do?

15           MR. JOHNSON: Certainly, I'll try in two  
16 sentences, and, Doug, kick me if I get much beyond two  
17 minutes. The revised reactor oversight process, the  
18 reactive oversight process, grew out of an effort that  
19 we took on really early 1998, late 1997, out of some  
20 concerns that the Commission had really with respect  
21 to how we were assessing the performance of plants and  
22 deciding what actions we were going to take.

23           And at that time, we had a number of  
24 processes, a number of different processes, in place.  
25 The Commission was concerned about subjective they

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1       were. The Commission had a very strong sense that --  
2       that subjectivity shouldn't be central to our  
3       assessment process; that we ought to be objective as  
4       possible.

5               For example, the Commission was concerned  
6       about the fact that we had -- we could be -- we could  
7       sense conflicting and sometimes overlapping messages  
8       through our various assessment processes.

9               And so, the Commission directed the Staff,  
10       or we got permission from the Commission, to do an  
11       integrated review of our overall assessment processes  
12       and to develop a replacement.

13              Around the mid-1998 time frame, we were  
14       talking to ACRS. We were talking to external  
15       stakeholders about that process. And we got feedback  
16       on that activity. And the nature of that feedback was  
17       still very critical, not just on where we were, but  
18       with where we were trying to go with respect that  
19       particular initiative.

20              That caused us to step back, to take a  
21       fresh look, and that fresh look became what is the  
22       reactor oversight process.

23              And in essence, what this reactor  
24       oversight process is, is it's a -- it's a process that  
25       starts with -- it's a hierarchical process that starts

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1 with the notion that there's a mission. It identifies  
2 strategic performance areas that have to be satisfied  
3 in order for the Agency to achieve its mission.

4 And then, we went and identified  
5 individual cornerstones within those strategic  
6 performance areas, the cornerstones being the key,  
7 essential information that if we're able to satisfy  
8 ourselves with respect to the performance plans, we  
9 can have confidence that our overall mission is being  
10 achieved.

11 And so, that's what the reactor -- how the  
12 reactor oversight process is structured. Now, within  
13 each of the cornerstones, we have performance  
14 indicators that -- that is, objective things that we  
15 can measure about the performance of the plant, that  
16 give us information about the performance of the  
17 plant.

18 We also have inspections because we  
19 recognize that performance indicators don't -- cannot  
20 possibly tell us everything that we need to know with  
21 respect to the individual cornerstones.

22 And we take those inputs from the  
23 performance indicators and from the inspections and we  
24 apply for thresholds to decide whether we ought to  
25 take, as the regulators, some increased regulatory

1 action in accordance with an action matrix, a  
2 structured matrix that enables us to meter out, if you  
3 will, what our response ought to be based on the  
4 performance of the plants.

5 And we take actions based on, again, the  
6 performance of the plant. So, that -- that's what we  
7 -- that's what we're about with respect to the ROP.

8 Now, today, we're going to talk about  
9 performance indicators, so you'll get a better sense  
10 of what that -- how they work. We're also going to  
11 talk about the significance determination process.

12 It turns out, when you do inspections,  
13 you've got to have a way, in this objective process,  
14 to be able to look at the findings from inspections to  
15 decide whether they're significant and warrant us  
16 taking some increased action, if you will, or whether  
17 they're minor, minor in nature.

18 And that's what the significance  
19 determination process does. So, you'll get a sense  
20 for how that works also today.

21 MR. LEITCH: Mike, I would just say, my  
22 perception is, too, that -- and just to amplify what  
23 you said, is that this was an effort to make the  
24 regulatory process more predictable, and to give  
25 licensees an early warning of regulatory issues.

1 I think, in the -- in the late 90's, my  
2 perception was that it seemed to be -- the regulatory  
3 process seemed to be very brittle in the sense that a  
4 plant would be going along, apparently in good  
5 condition from a regulatory viewpoint.

6 And then, all of a sudden, a situation  
7 would occur, either an operating event or some  
8 inspection would discover some particular flaw. And  
9 then, once that opened up, it seemed like it rapidly  
10 spread to the plant being effectively in a regulatory  
11 shut-down sometimes initiated by the licensee, but, in  
12 effect, a regulatory shut-down.

13 So, I think the effort here -- correct me  
14 if I'm wrong, Mike -- but my perception is the effort  
15 here is to try to -- is to temper those actions, make  
16 them more predictable, and anticipate declining  
17 regulatory performance and take action before it gets  
18 all the way to "The sky is falling; we've got to shut  
19 this plant down."

20 DR. FORD: Since the utilities are  
21 stakeholders in this, are they part of the team?

22 MR. JOHNSON: We have had a number of  
23 opportunities -- provide routine opportunities, as a  
24 matter of fact, for stakeholders, external  
25 stakeholders, to interact with us.



1 And that began back in -- back in 1998, as  
2 a matter of fact. It was sort of the watershed  
3 workshop that cast the structure for this. The  
4 framework of ROP was an external meeting where we had  
5 stakeholders; we had industry; we had the Union of  
6 Concerned Scientists; we had -- we had everyone that  
7 would show up involved in helping us develop and get  
8 alignment on how that process out to be laid out. And  
9 that continues today.

10 DR. FORD: But they're not part of this --  
11 these results? They weren't part of the team that  
12 came up with these results so far?

13 MR. JOHNSON: They -- well, we -- how can  
14 I explain this? I'm trying to be very brief, and not  
15 -- and not take a lot of Doug's time. We have --  
16 we've had a number -- as we implement the process,  
17 there are a number of opportunities for external  
18 stakeholders to remain involved.

19 For example, when Don Hickman talks about  
20 performance indicators a little bit later on, we're  
21 going to talk about, for example, the fact that some  
22 of the performance indicators caused -- that is a  
23 reporting criteria that caused licensees to raise  
24 questions that require some interpretation.

25 Well, in resolving those questions, those

1 scruply-asked questions we call them, we have a  
2 monthly -- about a monthly meeting with the NRC and  
3 the industry, attended by NEI. And it's a public  
4 meeting where we take on those individual issues and  
5 work to agreement on the decisions with respect to who  
6 we should interpret the criteria or whether, in fact,  
7 we ought to change those reporting criteria to address  
8 a question.

9 That's an example of sort of the ongoing  
10 interchange -- exchange that we have with external  
11 stakeholders in implementing the process.

12 And so, they are -- the industry is. I  
13 mean, when we talk about the results of the process,  
14 we're going to tell you -- in July, we're going to  
15 tell you how we've implemented the process from an  
16 internal perspective.

17 But we're also going to tell you how we  
18 think that process has impacted the performance of the  
19 industry. So, it's hard to separate the two.

20 DR. BONACA: Yeah, just one comment I  
21 would like to make; it was simply there is an  
22 impression almost that there was no significant  
23 determination prior to this system.

24 There was, and the significance was based  
25 on the degree of compliance. And today, the

1 significance is an elimination process based on risk.  
2 That's really the big shift there, okay?

3 So, compliance, alone, is not anymore  
4 material. I mean, typically -- I mean, if you had a  
5 finding, nobody very much looked at, you know, is it  
6 significant from a safety standpoint?

7 It was, you know, how far are you from  
8 compliance within the acceptable regulation? And that  
9 really was the basis for determination of  
10 significance.

11 DR. APOSTOLAKIS: This Agency has been  
12 accused of, in some past instances -- it's  
13 overreactive. Would this process help us not to  
14 overreact in the future?

15 MR. JOHNSON: Doug, do you want to take  
16 that? In fact --

17 DR. APOSTOLAKIS: What did you say, Doug?

18 MR. COE: Yes, you're exactly right. It  
19 helps us not to overreact, and it helps us not to  
20 under-react. We want, as Mike indicated earlier, a  
21 consistent and more predictable process. And I think  
22 that your points were right on.

23 I think that the prior process, although  
24 there was an attempt to be thoughtful and to be  
25 consistent, it was more subjective. And over time,

1 there were differences that arose as to how we reacted  
2 to various things, either under-react or overreact.

3 And so, this was the essence of the  
4 concern that ended up where we are today.

5 DR. APOSTOLAKIS: Okay.

6 CHAIRMAN SIEBER: And in fact, that gets  
7 back to the statement that I made earlier about the  
8 perceived fairness of it all and -- which, to me, is  
9 a very important aspect of what it is you're doing  
10 here.

11 MR. COE: And people say fairness is  
12 predictability and understandability --

13 CHAIRMAN SIEBER: Predictability and --

14 MR. COE: -- transparency --

15 CHAIRMAN SIEBER: -- consistency.

16 MR. COE: -- and consistency, yes.

17 CHAIRMAN SIEBER: Right.

18 MR. JOHNSON: Now, you might -- you might  
19 remember Chairman Jackson's -- one of Chairman  
20 Jackson's favorite words was "scrutability". And we  
21 think this process goes a long ways towards helping us  
22 be very clear about what the issues are, what are  
23 determination of those -- the significance of those  
24 issues is, and how we got to where we end up with  
25 respect to what actions we ought to take.

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1           So, we think the process -- and again,  
2           that goes back to one of the key things that we're  
3           measuring about the process, what we think the process  
4           should measure.

5           Okay, that's what I was going to talk  
6           about under "overall results". Now, Doug is going to  
7           start the SDP discussion.

8           MR. COE: Thank you. Just building on  
9           what we just have talked about, the SDP is necessary  
10          to characterize the significance of inspection  
11          findings as one of two inputs to the action matrix;  
12          the other being the performance indicators.

13          And the scale that was -- we tried to  
14          achieve with the SDP is intended to be consistent with  
15          the scale, the threshold scale, that is used for the  
16          performance indicators and when -- and when we take  
17          certain responses, based on those performance  
18          indicators.

19          It started with the application of risk  
20          insight and risk thinking from a reactor safety  
21          standpoint. But as you'll note, we have seven  
22          cornerstones, some of which, in the safeguards area or  
23          the occupational or public radiation health area, of  
24          the emergency preparedness area, may not have a direct  
25          link to a core damage frequency risk matrix.

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1                   And in those cases, we still have an SDP  
2                   because we still need an SDP to characterize  
3                   inspection finding significance so that it can feed  
4                   the assessment process.

5                   And we try, in those cases, to make a  
6                   consistent parallel with the risk matrix of the  
7                   reactor safety SDP in order that the response that the  
8                   Agency would give to particular inspection findings is  
9                   consistent across cornerstones.

10                  That's a more subjective judgement, and  
11                  it's one that we're -- you know, as we get more  
12                  experience, we continue to refine.

13                  Today, we're going to talk about the  
14                  reactor safety SDP because we understood that this was  
15                  your primary interest. And so, what I'm going to show  
16                  you are -- actually, I've got four examples, two of  
17                  no-color findings -- and I'll explain what conditions  
18                  arise, or what circumstances arise, that we would not  
19                  colorize a finding -- one green finding, and one non-  
20                  green finding.

21                  These are all real examples. In fact, for  
22                  three out of the four, I basically cruised our website  
23                  and plucked those three examples, the first three that  
24                  you'll see, right out of our website. And I've  
25                  referenced the inspection report numbers if you care

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1 to look further.

2 The fourth one, the non-green finding, is  
3 also a real example, but it hasn't been published yet.  
4 So, I've sanitized in terms of its -- the description  
5 of what -- what the plant was and so forth. But it  
6 was, in fact, a real example.

7 So, we'll get on with the first example.  
8 The no-color finding category are findings which don't  
9 affect the cornerstone, or which have extenuating  
10 circumstances. These are the two primary categories  
11 of no-color findings.

12 The decisions on whether to colorize the  
13 finding or not is made prior to entry into the SDP.  
14 It's -- the guidance that governs that is Manual  
15 Chapter 0610\*, and there's a series of questions that  
16 are asked.

17 I'm going to try -- I'm going to show you,  
18 kind of at a high level, how those questions result in  
19 a no-color finding.

20 The first example that I've got here was  
21 an inspection procedure that asked the inspectors to  
22 look at licensee LERs. And the finding that was  
23 reported in an LER was the missed surveillance test  
24 for the control room oxygen detector.

25 Now, the guidance in 0610\* is that if it

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1 -- if a finding does not affect the cornerstone and,  
2 therefore, cannot be process by an SDP, then it is  
3 documented as a no-color finding.

4 In the example that we have here, the  
5 cornerstones in the reactor safety area are initiating  
6 events, mitigating systems, barriers, and emergency  
7 preparedness. And that's under the reactor safety  
8 cornerstone.

9 So, looking at that particular finding,  
10 the lack of a -- or the failure to do a surveillance  
11 test for a control room oxygen monitor, when looked at  
12 from the standpoint of does it -- does it actually  
13 affect the cornerstone, and would it -- would it be  
14 possible to evaluate that finding through the SDP  
15 process using delta-core damage frequency, or delta-  
16 large early release frequency as the matrix.

17 The answer would be no, and that's what  
18 came out of the 0610\* lodging.

19 DR. KRESS: Doug, what's the purpose of  
20 that oxygen monitor?

21 MR. COE: The purpose of the oxygen  
22 monitor, I would presume -- and I can't say for sure,  
23 but based on my general understanding -- is that  
24 oxygen monitors are there in case the control room is  
25 enclosed, becomes enclosed, sealed, through, you know,



1 control room isolation functions.

2 And therefore, then there's a --

3 DR. KRESS: A chance of depleting --

4 MR. COE: -- monitoring process -- a  
5 monitoring instrument that, then, would tell the  
6 operators that they were getting dangerously low  
7 oxygen levels.

8 DR. APOSTOLAKIS: But then, it seems to me  
9 that it would be under the broad category of reactor  
10 safety, would it not?

11 DR. KRESS: That's what I was wondering.

12 MR. COE: You could say it could be under  
13 the broad category of reactor safety. The next  
14 question you could ask is how would you characterize  
15 it was significant?

16 If you're looking at delta core damage  
17 frequency or delta large early release frequency,  
18 there's really no -- there's no connection there.

19 DR. APOSTOLAKIS: Well, I would say that  
20 its contribution to the facility is really negligent.  
21 I mean, that's probably a more accurate statement.

22 And one does not need to do an analysis to  
23 see that.

24 MR. COE: I wouldn't necessarily disagree.  
25 But what we're trying to do is come up with guidance

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1 that does produce the right results. And in fact, in  
2 very early stages of the development of this process,  
3 the criteria that we're discussing here on how to  
4 color -- how to choose not to color an inspection  
5 finding didn't exist.

6 And there was a -- there was a thought  
7 being given at that time that there were -- if you  
8 couldn't meet the threshold for greater significance,  
9 it would be a green finding. And we would basically  
10 have a lot of green findings, okay?

11 Now, somewhere along the way, in the  
12 development of this process, it was decided that  
13 having a no-color category would be useful, I think  
14 initially because of the extenuating circumstances  
15 that we're going to talk about in a minute.

16 DR. APOSTOLAKIS: But in this particular  
17 case, if we would go back to the previous -- slide  
18 five -- no, this is six, yeah --

19 MR. COE: Yes.

20 DR. APOSTOLAKIS: -- the definition says,  
21 "findings which do not affect the cornerstone or which  
22 have extenuating circumstances." It seems to me  
23 saying that the finding does not affect the  
24 cornerstone is too strong.

25 I mean, has a negligible impact; I think

1 that's more accurate. Maybe that's what you mean by  
2 "does not affect." And when you are elaborating on  
3 it, you actually -- that's what you said, that, you  
4 know, calculating that was really a waste of resources  
5 for this particular case.

6 MR. COE: Yes.

7 DR. APOSTOLAKIS: And the end result is  
8 known in advance. It's going to be very, very small.  
9 But it does fall under the cornerstone of reactor  
10 safety.

11 DR. SHACK: But what is the question the  
12 man asked to make that decision? Does he say, "Does  
13 this affect -- is this going to affect the initiating  
14 events?" What are the actual questions he asks  
15 himself so he comes up with that answer?

16 MR. COE: Well, those are questions that  
17 are articulated in 0610\*, Appendix B. And for reactor  
18 safety cornerstones, not including emergency planning,  
19 they include the following questions: Could the issue  
20 cause or increase the frequency of an initiating  
21 event? That's the first question.

22 The second question is, could the issue  
23 credibly affect the operability, availability,  
24 reliability, or function of a system or train in a  
25 mitigating function?

1                   There's four questions.       The third  
2 question is, could the issue affect the integrity of  
3 fuel cladding, the reactor coolant system, reactor  
4 containment, or control room envelope, the integrity  
5 of those things?

6                   And four, does the performance of the  
7 issue involve degraded conditions that could  
8 concurrently influence any mitigation equipment and an  
9 initiating event?

10                  In other words, could you -- could you  
11 affect the likelihood of an initiating event at the  
12 very same time with the -- with the same issue that  
13 you would degrade a mitigating function?

14                  So, those are the questions that are  
15 asked. And I don't disagree that --

16                  DR. APOSTOLAKIS: Doug, let me -- I think  
17 communication and using the right words are very  
18 important whenever you do things like this. I mean,  
19 we found that out and PRAs and so on.

20                  Instead of saying that we will not do --  
21 I mean, we screened things out in the PRA repeatedly,  
22 and nobody objects, okay? And nobody has come back  
23 and said, "Gee, you know, you really missed it, after  
24 25 years of experience."

25                  Instead of saying we're not going to do

1 it, maybe a better way of saying it is that a crude  
2 evaluation shows, or a conservative evaluation shows,  
3 that the CDF is negligent.

4 That sends the message that you have  
5 thought about it; you have evaluated it. You have not  
6 made the decision in advance not to evaluate it; which  
7 I think you are evaluating in some sense, you just  
8 don't want to spend too much time on it because, you  
9 know, professional judgement evidence shows it's not  
10 going to make any difference.

11 So, I think sending the message in a  
12 different way is probably better.

13 MR. COE: We can take that comment because  
14 it gets at a discussion, a dialogue, that has occurred  
15 since this guidance was formulated. And there are  
16 persons on the staff who feel much the same way you  
17 do.

18 I would say that there are other examples,  
19 and perhaps this isn't the best example, but, for  
20 instance, a finding which involves a missed  
21 surveillance test, which then, the surveillance test  
22 is subsequently performed and found to be acceptable.

23 Now, was there an impact on the  
24 cornerstone? Was the cornerstone functioned -- were  
25 any of the characteristics or attributes in the

1       cornerstone for mitigating systems affected?

2               Well, the answer would be no, not at all  
3       in that case. So, maybe that's a better example of a  
4       finding which doesn't affect a cornerstone. And to  
5       try to define that threshold, does it or doesn't it,  
6       is somewhat subjective, I would have to say.

7               DR. APOSTOLAKIS: I understand. And I  
8       think -- you know, I think you understand the spirit  
9       of my comment. But I have another question. If the  
10      finding does not affect the cornerstone, and you guys  
11      have declared that these are the things you care  
12      about, why bother?

13              MR. JOHNSON: I'm sorry, why --

14              DR. APOSTOLAKIS: Why bother to look at it  
15      at all?

16              MR. COE: Typically --

17              DR. APOSTOLAKIS: You know that --

18              MR. COE: Typically they are violations,  
19      that -- for example -- oh, I don't know; we've got  
20      violations of, like I say, missing surveillance tests  
21      or of other administrative regulatory requirements  
22      that can't really be processed through the SDP.

23              And in fact, one of the reasons why the  
24      no-color finding category came into being in the first  
25      place was to assess whether or not these findings that

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1 could not be processed through the SDP warrants a  
2 significant determination process of their own.

3 And this question has come up in a number  
4 of areas, such as -- and most particularly, I think,  
5 in the cross-cutting areas, human performance issues,  
6 where mistakes are made, or errors are made, in the  
7 cross-cutting areas of performance -- problem  
8 identification and resolution.

9 So, you know, it's a broad category of  
10 things that we find cannot really -- don't really --  
11 don't really comport with an SDP that's been created.  
12 And we really can't make a link to core damage  
13 frequency changes or delta alert changes.

14 So, we're left with this set of findings  
15 that may be regulatory issues, may be regulatory  
16 violations, that we're not sure what to do with. So,  
17 we put them in this category.

18 DR. APOSTOLAKIS: I thought we were trying  
19 to get away from that.

20 MR. JOHNSON: We are, George. Let me give  
21 you an example -- let me give you another example that  
22 perhaps adds to the examples that Doug has given that  
23 were very good.

24 One of the things that you'll recognize  
25 that we ought to care about, as a regulator, that may

1 not have a direct impact on the cornerstone, as we've  
2 been able to measure in terms in terms of the results  
3 of an inspection finding, is something, for example,  
4 that would impact the regulatory process or our  
5 ability to -- to effectively regulate the performance  
6 of the licensee.

7 For example, let's suppose -- and this is  
8 a scenario that we've come -- we've had some concerns  
9 with respect to performance indicators. And that  
10 would be, for example, a situation where a licensee  
11 inaccurately reported a performance indicator, you  
12 know, or let's -- the example where there were some  
13 willfulness, a violation that was willful in nature.

14 And maybe that would have a -- maybe there  
15 would be an element of that that would have an impact  
16 on the plant, that you could run through an SDP that  
17 would have an impact on the cornerstone.

18 But the willful nature, or the inaccurate  
19 reporting, or you know, those kinds of issues are also  
20 issues that, again, when you look at the questions and  
21 the things in 0610\*, the excerpt that we just handed  
22 you, are not things that you necessarily get through  
23 an SDP on, but things that we ought to care about as  
24 the regulator. Those are other examples.

25 DR. APOSTOLAKIS: But you care about them



1 because they're supporting things that need to be  
2 done --

3 MR. JOHNSON: Absolutely.

4 DR. APOSTOLAKIS: -- because they affect  
5 the cornerstone.

6 MR. JOHNSON: Or they eventually --

7 DR. APOSTOLAKIS: Could affect -- could  
8 affect.

9 MR. JOHNSON: Could affect the  
10 cornerstone.

11 DR. APOSTOLAKIS: Good, good.

12 DR. SHACK: Let me come back -- I didn't  
13 like the answer to the surveillance test one because  
14 this one -- you know, this one, if I answer these four  
15 questions, if the thing failed the surveillance test,  
16 I think I would have answered the four questions in  
17 the same way.

18 You know, when it comes to you, a  
19 surveillance test, and you say, "Okay, it was an  
20 important component; I missed the surveillance test.  
21 But when I did test it, it was okay, and it had no  
22 impact," that's an answer I don't think I like because  
23 that tells me I got lucky.

24 You know, if I can't -- you know, it seems  
25 to me these things should be hypothesized. You know,

1 if I missed a surveillance and if the surveillance  
2 test was negative, then I could still answer these as  
3 no significance.

4 If I missed a surveillance test and it  
5 happened -- you know, the thing that has always  
6 bothered me about these things is everything is going  
7 to be green until something really happens.

8 You know, yeah, it's no problem if you  
9 miss a surveillance test as long the thing is working  
10 well. You know, I either find out the thing is not  
11 working when I need it or in a surveillance test.

12 MR. JOHNSON: Well, and I know Doug has  
13 got a perfect answer for this, but let me just cut in  
14 with my less than perfect answer, and then he can  
15 correct me.

16 You know, when we say -- when things make  
17 it through the findings threshold; that is, they are  
18 more than minor, we're not -- we're talking about, in  
19 every case, something that we want the licensee to do  
20 something with.

21 No-color findings are not -- for example,  
22 a missed surveillance test or, you know, anything that  
23 we documented in the inspection report as a finding or  
24 as a green finding, you know, a finding on very low  
25 risk significance, are all issues that the licensee

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1 needs to correct.

2 It's not that we're setting them aside,  
3 that they can -- that they can have the option of  
4 doing nothing with. They've got to put them in their  
5 corrective action program, and we look at their  
6 corrective action program as part of our periodic PI&R  
7 -- PI&R, problem identification and resolution  
8 inspection procedure, to make sure that they're doing  
9 something with those issues.

10 So, we're not -- we're not setting them  
11 aside, but they are clearly less significant than in  
12 a situation where you would have had, say, a missed  
13 surveillance test found -- that a surveillance test  
14 was found that there was a problem with that  
15 component.

16 And that component, when you go back and  
17 you look and see, there was a condition that was  
18 brought on by some issue that happened a long time  
19 ago. And so, you can really look at how long that  
20 particular situation existed.

21 MR. LEITCH: So, why do you take --

22 DR. APOSTOLAKIS: So, why --

23 MR. LEITCH: Excuse me. I was just going  
24 to say, could you take me through the line of  
25 reasoning that would apply? Here's the licensee that

1 missed one surveillance test, and this is the only one  
2 he has missed in a year, versus another licensee that  
3 has missed ten surveillance tests in a year.

4 And every one of those goes through the  
5 analysis, and every one is no-color. Is there some  
6 kind of a trending? How do you -- how do you deal  
7 with that, or would you like to deal with that?

8 MR. JOHNSON: The way we do that is -- and  
9 Steve Stein, is he wondering around the audience?  
10 Make sure your ears perk up for this. The way we do  
11 that is, if we have a finding, and that finding is  
12 more than minor -- I'm sorry, a finding is more than  
13 minor, and we're documenting it in the inspection  
14 report.

15 If there is some cross-cutting element of  
16 that finding, we document that in the inspection  
17 report. And when I say "cross-cutting," I mean things  
18 like -- the cross-cutting issues are things that are  
19 -- have impact on whether the licensee has a good PI&R  
20 system, problem identification and resolution system.

21 If they're human performance in nature, if  
22 they're human performance things that are going on,  
23 that are, again, cross-cutting, and if there are  
24 safety conscience work environment issues that are  
25 going on -- different from safety culture -- safety

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1 conscience work environment -- by that, we mean is  
2 there something that is indicative of there being a  
3 chilling effect, if you will, a hesitancy on the part  
4 of the plant staff to raise issues. Those are cross-  
5 cutting issues.

6 Well, if we have a finding in an  
7 inspection report, and there is this cross-cutting  
8 nature to it -- performance, problem identification,  
9 safety conscience work environment, those get  
10 documented in the inspection report.

11 And as a part of our problems  
12 identification and resolution inspection, we -- today,  
13 on an annual basis -- and we're changing the period as  
14 to that a little bit, and making some other changes  
15 that we think improve that inspection.

16 But we look at those issues, the  
17 collection of those kinds of issues, to see if that  
18 tells us that the licensee has what we call a  
19 substantial -- a trend, an average trend with respect  
20 to substantial problems in this cross-cutting area.

21 And we document those in the assessment  
22 letter. We talk about those with licensees to get  
23 licensees to get them resolved.

24 CHAIRMAN SIEBER: Does that mean that  
25 you're actually doing a bean count as you go through

1 the period of missed surveillance and other kinds of  
2 things that licensees do that cause a non-cited  
3 violation because you can determine whether a cross-  
4 cutting issue is there or not?

5 MR. JOHNSON: I wouldn't say -- I wouldn't  
6 use the word "bean count". In fact, the Commission  
7 was very careful with us to give us -- the Commission  
8 told us to be very careful with respect to how we --  
9 how we treat issues that are green.

10 The Commission was concerned that we would  
11 take a collection of -- we would count greens, things  
12 that have a very low risk significance --

13 CHAIRMAN SIEBER: Right.

14 MR. JOHNSON: -- and we would somehow  
15 amalgamate them, if you will --

16 CHAIRMAN SIEBER: Right.

17 MR. JOHNSON: -- and roll them up into  
18 something and make a big splash.

19 CHAIRMAN SIEBER: Now, that's the old  
20 system.

21 MR. JOHNSON: Right, that was the old  
22 system. But we think it's very --

23 CHAIRMAN SIEBER: And you can always write  
24 a finding against your QA program.

25 MR. JOHNSON: Exactly.

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1 DR. BONACA: Let me ask you a question  
2 more specific. Go to the next slide, if you could.  
3 Look at disposition of finding, "confirmed entry into  
4 the licensee corrective action program." I mean, we  
5 come back to this, as we came back before.

6 Here is what -- are you abandoning the  
7 issue once it's in a corrective action program, or are  
8 you looking for how timely they're going to address  
9 the issue, and whether or not this is a repeat issue?

10 I mean, these are two fundamental elements  
11 of the corrective action program. And that answers a  
12 lot of questions. If you say, yeah, we're going to  
13 count it, and we keep an eye on that, then I am  
14 comfortable with this.

15 MR. JOHNSON: That's exactly what we're  
16 saying.

17 DR. BONACA: Okay.

18 MR. JOHNSON: We're saying that we --

19 DR. BONACA: So --

20 MR. JOHNSON: In this PI&R inspection,  
21 that's exactly what we do; we go look at what is in  
22 the corrective action system. We ask ourselves, you  
23 know, is the licensee dealing with issues? Are there  
24 issues there that are significant that the licensee  
25 hasn't dealt with; you know, are there -- are there

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1 patterns?

2 Steve, do you want to -- now is a good  
3 time for you to jump in.

4 MR. STEIN: Steve Stein, Inspection  
5 Program Branch; I just wanted to clarify one point on  
6 that previous example. What made it a no-color  
7 finding was that -- was the equipment, was the control  
8 room oxygen monitor, not the fact that it was a missed  
9 surveillance.

10 The missed surveillance on a mitigating  
11 system, on an injection valve, or pump, or on the EDG,  
12 would fall within a cornerstone and would go through  
13 the SDP.

14 And all the conditions associated with  
15 that could make that more than of very low  
16 significance. So, that's the point I wanted to make,  
17 that what made that no-color was the equipment, not  
18 the fact that a surveillance was missed.

19 MR. JOHNSON: All right --

20 DR. APOSTOLAKIS: Which seems to me  
21 supports what I said earlier, that you really need a  
22 conservative analysis as to be in your mind, and  
23 dismiss it, which I think is perfectly all right. I  
24 mean, that's how we do all these things.

25 MR. JOHNSON: Yes, because --



1 DR. APOSTOLAKIS: If we have a problem  
2 somewhere, and we analyze it, and we find out the  
3 delta CDF is delta less -- or smaller than something,  
4 then that's a green. So, green is good.

5 MR. JOHNSON: No, no. Green is not good.  
6 Green issues are still issues that we think the  
7 licensee needs to do something with.

8 DR. APOSTOLAKIS: So, if the number of  
9 scrams is smaller than the number you specified, which  
10 is good, you give the guy a green, don't you?

11 MR. JOHNSON: With respect to -- okay, we  
12 were talking about inspection issues. Now, green with  
13 respect to the performance indicators means that that  
14 performance is in the expected range, sort of this  
15 nominal range, of licensee performance.

16 DR. APOSTOLAKIS: Right.

17 MR. JOHNSON: So, in that case with  
18 respect to scrams, yes, scrams --

19 DR. APOSTOLAKIS: But green cannot mean --  
20 I mean, is one of them light green and the other is  
21 dark green?

22 MR. JOHNSON: They're green.

23 DR. SHACK: Well, but still, no color  
24 does, in fact, highlight the fact that it's green. I  
25 mean, there's a difference between no color and green.

1 DR. APOSTOLAKIS: Exactly, that was my  
2 question. Why bother? Why not declare this a green?

3 MR. JOHNSON: We --

4 DR. SHACK: What's the difference?

5 MR. COE: That's a dialogue that has  
6 occurred on an ongoing basis within the Staff.

7 MR. JOHNSON: And in fact, this was an  
8 issue that we talked about. We recently had an  
9 external lessons learned workshop to roll up the  
10 results of the first year of implementation and to  
11 talk with the industry and other external  
12 stakeholders.

13 And this issue of no-color findings was  
14 one that we talked about, and the kinds of concerns  
15 when something like -- you know, you've got a system  
16 that uses colors. We can understand the significance  
17 of colors.

18 But here are these findings that you don't  
19 assign a color to because you say they're outside of  
20 the cornerstones. And what's the significance of  
21 those?

22 There seem like there are a lot of those,  
23 perhaps. We should really do something with no-color  
24 findings. And in fact, we went into that workshop  
25 with a proposal that we were going to turn those no-

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1 color findings into greens.

2 And what do you think the industry's  
3 response was? The industry said, "Don't make those  
4 things all greens. We care about greens just like we  
5 care about everything else."

6 And so -- and so, the dialogue continues  
7 with respect to how to treat these issues.

8 DR. APOSTOLAKIS: Okay, so let's put in a  
9 different way then. Why don't we go to the  
10 performance indicator for scrams; and if you are below  
11 the appropriate threshold, that is a no-color finding  
12 instead of green?

13 MR. COE: That's not a finding.

14 DR. APOSTOLAKIS: It's the same rationale.

15 MR. COE: You see, that's not a finding,  
16 George. That's -- you've got performance indicators,  
17 which are just data collection, and then you've got  
18 findings which are actual -- some kind of deficiency  
19 occurred.

20 The licensee's performance was deficient  
21 in some respect, and that was the source of the  
22 finding.

23 DR. APOSTOLAKIS: So, "finding," you're  
24 using it in the regulatory sense?

25 MR. COE: That's right.

1 DR. APOSTOLAKIS: Again -- I don't know,  
2 this no-color business is not very comforting.

3 MR. JOHNSON: We agree, we agree. But  
4 again, having said that, there are issues -- you can  
5 get yourself to the point where you can find issues  
6 that when you try to treat them through the SDP, you  
7 cannot.

8 But when you ask yourself the group three  
9 questions in that excerpt that we handed you, if they  
10 still are things that we ought to be concerned about  
11 as an Agency, then those are things that are no-color  
12 findings.

13 DR. BONACA: Actually, I think, you know,  
14 in part is the issue that -- if you look at the  
15 specific of this, you know, for it to be significant,  
16 you would have to have a significant event: a  
17 release, a problem with the control room, the need for  
18 oxygen in it, and then find that you don't have it  
19 because you didn't monitor it right.

20 So, the risk, in itself, is minute. And  
21 yet, there are thousands of activities where  
22 compliance is important because without compliance,  
23 you don't have the assurance that in case you have that  
24 kind of residual event that happens, you can deal with  
25 it.

1 And I think that somehow we have to still  
2 deal with this thousands and thousands of compliance  
3 issues. And so, I'm trying to understand how -- I'm  
4 not disagreeing at all with you, George.

5 I'm only saying that they still are  
6 significant individually because if you don't maintain  
7 some level of significance applied to them, well, you  
8 would have literally collapse of this commitments; I  
9 mean, particularly --

10 DR. APOSTOLAKIS: Well, I think there are  
11 two issues.

12 DR. BONACA: -- what people are going to  
13 say, "Well, likelihood for it to happen is so remote,  
14 why should I" -- you know?

15 DR. APOSTOLAKIS: It seems there are two  
16 issues, Mario, that have been raised here. One is the  
17 consistency of the approach, the self-consistency.

18 DR. BONACA: Sure.

19 DR. APOSTOLAKIS: In other words, when we  
20 do something with the PIs or the significance  
21 determination process and we declare something to be  
22 no-color or color of this, we have to be self-  
23 consistent.

24 The second is I appreciate that, you know,  
25 we want to have a higher degree of confidence by doing

1 -- having these additional requirements. But I  
2 thought over the last four or five years, we were  
3 trying to move towards a risk-performance based  
4 system, which is different in spirit.

5 So, I don't know how -- I mean, it seems  
6 that we are still worried about things that are --  
7 admittedly, the risk is insignificant.

8 DR. SHACK: But I think their four  
9 screening questions are very good. You know, they  
10 seem to me to, you know, have answers that are  
11 scrutable and, you know, do a first cut at coming up  
12 with those questions in a way that an inspector, I  
13 think, has a chance of dealing with them.

14 DR. BONACA: Absolutely, and look at the  
15 disposition of this; it goes into the corrective  
16 action program. I mean, it simply says "Do it." And  
17 the only activity is they want to monitoring if the  
18 corrective action program works. So --

19 DR. APOSTOLAKIS: If I look at the action  
20 matrix -- which we're not going to discuss today --  
21 but if I look at it, I think if I have a green finding  
22 someplace, do I ask them to do something?

23 MR. JOHNSON: You're not --

24 DR. APOSTOLAKIS: No, no, it has to be a  
25 licensee corrective action. When do I involve the

1 corrective action program and ask them to do  
2 something? It has to be white?

3 MR. COE: The action -- well, no.

4 MR. JOHNSON: The problem identification  
5 and resolution inspection that I talked about happens  
6 as part of the baseline, happens for every plant,  
7 regardless.

8 When the action matrix gets invoked is  
9 when thresholds are crossed. So, if you had a white  
10 issue, then you'll see -- you'll see that you change  
11 columns.

12 DR. APOSTOLAKIS: Yes, so, nothing green;  
13 you don't do anything when it's green?

14 MR. JOHNSON: Right, but we'll talk --  
15 we'll go through the action matrix.

16 MR. COE: Remember, a licensee that has  
17 findings and performance indicators in the green range  
18 is considered in a licensee response band. That's the  
19 characterization we've given it from an assessment  
20 point of view.

21 So, what is it, 80 percent of the plants,  
22 or whatever it is, are in the licensee response band,  
23 and we expect them to deal with the lower level  
24 issues, the ones that we don't feel a need to engage  
25 them on.

1                   And so, their corrective action program is  
2                   expected to correct those lower level issues before  
3                   they become manifested in larger issues.   And their  
4                   motivation to do that, of course, is to -- is to  
5                   continue to be treated in the licensee response band;  
6                   that is, not get extra NRC attention, and inspection  
7                   effort, and activity.

8                   DR. APOSTOLAKIS:   Now --

9                   MR. JOHNSON:   Before we leave, can I also  
10                  just add to you --

11                  DR. APOSTOLAKIS:   We're not going to  
12                  leave.

13                  MR. JOHNSON:   -- add that when we talked  
14                  about this issue, you know, we really thought the  
15                  stakeholders who would be most concerned with no-color  
16                  findings would be members of the public.

17                  But in fact, Dave Lochbaum, who was -- who  
18                  was there, didn't really share our view. He didn't --  
19                  he wasn't all that concerned about no-color findings,  
20                  to be all that honest.

21                  And maybe it's because when we started off  
22                  the year of initial implementation, we had -- we had  
23                  a number of no-color findings. But that has gradually  
24                  decreased as we were able to get out guidance with  
25                  respect to these screening questions.



1 And so, the numbers really are -- and I  
2 don't want to leave you with the impression that there  
3 are a lot of these things going around. There truly  
4 are not.

5 And I think this may be a concern that we  
6 were more worried about than either the industry or  
7 others, like stakeholders.

8 DR. APOSTOLAKIS: You see, Mike, one of  
9 the -- I am concerned on self-consistency. You have  
10 an example later where an inspection finding led to  
11 green, correct?

12 MR. JOHNSON: We have one, yes.

13 DR. APOSTOLAKIS: Okay. Now, inspection  
14 finding, by definition, is -- Doug just told us is  
15 some sort of violation somewhere. You forgot  
16 something; you did something incorrectly.

17 MR. COE: It could be a violation or it  
18 could also be some kind of deficient performance that  
19 was not a violation. That's fundamentally it, but  
20 which contributed to an increase in risk, for example.

21 DR. APOSTOLAKIS: And you declare that as  
22 a green. On the other hand, when it comes to  
23 performance indicators, green means expected  
24 performance, you just told us. Isn't there an  
25 inconsistency there?

1 MR. COE: Yes. Actually, in that respect,  
2 there is. Both the -- well, the performance  
3 indicators include performance that we expect to occur  
4 as well as, in some cases, that which we don't expect.  
5 For example, unavailability performance indicators in  
6 the reactor safety cornerstone have a component of  
7 unavailable that occurs due to normal, routine  
8 maintenance, which is acceptable, as long as it's  
9 performed under the maintenance rule guidance.

10 And then, there might be additional time,  
11 exposure time, of unavailability of equipment that's  
12 due to some kind of deficiency that is, then, added to  
13 that performance indicator. So, that's a particular  
14 performance indicator where you've got a combination  
15 of poor performance contributions to that indicator,  
16 as well as acceptable performance.

17 But fundamentally, you know, you're right.  
18 An inspection finding is always associated with some  
19 performance issue; a PI may not be.

20 DR. APOSTOLAKIS: But ultimately, the  
21 inspection findings feed into the action matrix too.

22 MR. COE: Yes.

23 DR. APOSTOLAKIS: So, now, it seems that  
24 the green means something different for those two, and  
25 we have different questions for the whites and the

1 yellows --

2 MR. COE: Well --

3 DR. APOSTOLAKIS: -- which presumably will  
4 mean something different too.

5 MR. JOHNSON: But George, with respect to  
6 the action that we take as an Agency, there's really  
7 no difference. If you have -- if you have a  
8 collection of only these kinds of findings that we've  
9 been talking about, they end up in the licensee's  
10 corrective action system. The licensee takes actions  
11 to address them.

12 We periodically go out and look, and  
13 that's it. The licensee -- and the licensee -- the  
14 performance is in the licensee response band, and so  
15 our actions are to do the baseline inspection.

16 If a plant has a scram or, let's say, two  
17 scrams in 7,000 critical hours, and the threshold is  
18 there scrams for 7,000 critical hours, once again,  
19 from a regulatory perspective, we're not doing  
20 anything. The licensee is in the licensee response  
21 band.

22 Now, if a licensee doesn't get  
23 increasingly concerned as they get close to that  
24 threshold, we think that's a problem. But again,  
25 we're not going to engage because the licensee -- the

1 plant is in the licensee response band.

2 It's only when they trip that threshold  
3 that that is that deviation from nominal performance  
4 to the white for those performance indicators, or we  
5 have an SDP result that is white in any of the -- in  
6 any of the SDPs.

7 It's that -- it's that that gets us to  
8 increased action, based on the action matrix. So, I  
9 -- now, they --

10 DR. APOSTOLAKIS: I guess --

11 MR. JOHNSON: -- they come together in a  
12 way that is consistent.

13 DR. APOSTOLAKIS: Well, we're going to  
14 have another subcommittee meeting to discuss the  
15 action matrix, so maybe a lot of these questions will  
16 come back when we do.

17 DR. SHACK: We're beating this to death.  
18 You just cut my --

19 DR. APOSTOLAKIS: It's already comatose.

20 DR. SHACK: I would have thought you'd had  
21 zillions of no-color findings. But what's really  
22 happening is the inspector is not going out and  
23 zinging them for things that -- I mean, he's providing  
24 another level of screening before he even asks the  
25 four questions, rather than playing gotcha.

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1                   Because I can't believe an inspector  
2                   couldn't go through a plant and just keep writing up  
3                   everything under the sun if he had a quota of  
4                   citations that he had to fill.

5                   MR. COE: That's right. And the NRC has  
6                   enforcement guidance on what constitutes minor  
7                   violations. And we've actually tried to incorporate  
8                   on that and expand on it a little bit in this process.

9                   So, the type of thinking that you're --  
10                  that you're thinking about now, that the inspector  
11                  does, is actually -- we've tried to formalize this in  
12                  this guidance. I'm just not discussing it right now.  
13                  But it's -- it is there.

14                  DR. SHACK: So there really is even  
15                  another level --

16                  MR. COE: Yes.

17                  MR. JOHNSON: Yeah. In fact, they are --  
18                  we haven't talked about them, but they're the group  
19                  one questions. If you look at the hand-out, there are  
20                  some group one questions that really help the  
21                  inspector try to distinguish what is truly minor.

22                  And I guess we don't -- I don't want to  
23                  take Doug off and have him go through those. But yes,  
24                  there is screening even before that.

25                  MR. COE: But the overall objective is to

1 get inspectors to be sensitive to the things that are  
2 potentially risk-significant, the things that are  
3 potentially significant in the other cornerstones.

4 And we've given them the -- the yard stick  
5 of the SDP is to help to define that in a much better,  
6 clearer way than we have in the past and, you know,  
7 towards the goals of objectivity and consistency.

8 So, let me pursue this now because the  
9 next example I've got on no-color findings is actually  
10 in the other category, which is, perhaps, maybe, a  
11 little bit more clear, less subject to, you know,  
12 dialogue and debate.

13 That is that that kind of a finding, which  
14 as extenuating circumstances -- and we define  
15 "extenuating circumstances," in our guidance. But  
16 principally, it's issues that may involve willfulness  
17 or issues in which the regulatory process is impeded  
18 because certain information which was required to come  
19 to us did not.

20 Okay, and in this particular inspection  
21 finding, the licensee submitted an application for  
22 operator license -- I believe that -- yes, an operator  
23 license application was submitted. And it was -- it  
24 incorrectly stated that certain training had been  
25 completed.

1           So, we were about to act on a license  
2 application to give an exam to an operator, and the  
3 information that we had was incorrect. The operator  
4 had not received the training that the license  
5 application stated that he had.

6           Okay, per our guidance, this is a finding  
7 that potentially impacts our ability to perform our  
8 function, since we have been given information that's  
9 incorrect, okay?

10           And in that case, if the impact of that  
11 can -- you know, does not affect the cornerstone; and  
12 in this case, it clearly did not because we caught  
13 this before the license -- before the operator was  
14 examined and put on-shift, then it's a no-color  
15 finding.

16           So, again, it's exactly as before. We  
17 confirm that the licensee entered that into their  
18 corrective action program, and then we treat it as a  
19 non-cited violation.

20           DR. UHRIG: Was this just an accident, or  
21 was it an error, or was this deliberate?

22           MR. COE: Well, I can tell -- I can  
23 certainly say that it -- our assessment was that it  
24 was not deliberate, okay? Because if it was, it would  
25 have been captured in a different -- in a different

1 way.

2 In fact, willfulness, in many cases I  
3 think what you would expect to see, not just as a non-  
4 cited violation. We would probably examine it for  
5 enforcement action above the non-cited level, as a  
6 severity four or a three, or higher. So --

7 DR. UHRIG: Usually, most of these things  
8 are errors somewhere along the line.

9 MR. COE: Yes, yes. But when we -- when  
10 they -- when we find them, we have to have a process  
11 to deal with them --

12 DR. UHRIG: Yes.

13 MR. COE: -- and to deal with them in an  
14 appropriate way. And again, I think that if the -- if  
15 the process is set up to disposition lower  
16 significance items, or findings, it allows the  
17 inspectors to do more -- to spend more effort, on  
18 areas that are potentially of greater significance.  
19 And that's the intent.

20 MR. LEITCH: Does it enter into your  
21 decision at all whether the item has been already  
22 entered into the licensee's corrective action program.  
23 Like say, for example, this issue here, say in --  
24 before it comes to your attention, say the licensee  
25 has reviewed the matter and said, "Oops, we found a



1 glitch in our training program. This fellow didn't  
2 really get this training," and they put it into their  
3 corrective action program, would that -- would that,  
4 in any way, affect this? Might this then --

5 MR. COE: Yes, actually --

6 MR. LEITCH: -- drop off the -- drop off  
7 the -- and not even be considered a finding?

8 MR. COE: Our guidance does not provide  
9 for inspectors to, what we call, mind the licensee's  
10 corrective action programs, except in one specific  
11 case, and that's our periodic problem identification  
12 and resolution inspection procedure.

13 MR. LEITCH: Right, right, yes.

14 MR. COE: And there, we send in a team of  
15 inspectors on a periodic basis to do just that. And  
16 we look at the corrective action program, the items  
17 that are in there, in a -- you know, we try to look at  
18 them in a risk-informed way or, you know, looking for  
19 the items of greatest significance and looking for  
20 trends and patterns and that sort of thing.

21 But the findings that come out of that  
22 have to be linked to the SDP in terms of their  
23 significance. In other words, we -- again like Mike  
24 said earlier, we're not allowed to go in there and  
25 aggregate things and then make them -- if they're all

1 green issues, or would be green issues if we put them  
2 through our SDP, we could not make a bigger deal out  
3 of that than the most significant of those findings  
4 individually.

5 DR. UHRIG: Suppose that this had happened  
6 before, had been put in the corrective action program,  
7 and it failed, and now it's showing up again. How do  
8 you -- what is the impact of this having happened  
9 before?

10 MR. COE: Well, if this is a repeat --

11 DR. UHRIG: Yes

12 MR. COE: -- that you're talking about, a  
13 repeat kind of condition, the philosophy that we're  
14 operating under is that licensees should be correcting  
15 these things at a lower level; and that if they don't,  
16 if this continues to repeat, and if the source of the  
17 continuation of this repeating problem is a more  
18 fundamental issue associated with their management  
19 controls or what-not, that we would expect ultimately  
20 that we would have inspection findings and/or  
21 performance indicators that would cross the threshold  
22 from green -- from the licensee response band -- into  
23 white in which we would engage.

24 DR. UHRIG: But it would be in the  
25 corrective action program, not here?

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1 MR. COE: Yes, it would -- if their  
2 corrective action program was not functioning, we  
3 would expect, over time, to see these kinds of issues  
4 manifested as higher significance issues.

5 If the licensee was doing a good job, and  
6 maybe, you know -- they're managing at a lower level,  
7 clearly. They're trying to keep the -- you know, the  
8 problems at a low level.

9 And the real question is, for us as an  
10 Agency is, has the threshold -- I mean, we're going to  
11 allow -- and I think somebody said earlier, we're just  
12 waiting for things to happen.

13 Well, we're not really because what we're  
14 doing is we're trying to define a threshold so that  
15 when things happen of a certain significance, we  
16 engage the licensee. And the intent is, is that we  
17 engage the licensee at a level before a significant  
18 impact to public health and safety occurs.

19 So, when a licensee issue comes up that's  
20 greater than green, it goes into the white region for  
21 instance, then we engage at a certain level. We  
22 expect that that was -- is still not a significant  
23 impact on public health and safety.

24 And we are going to engage at that level.  
25 We consider that an early engagement as the problems

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1 have now departed from the licensee response band, and  
2 now they're in the regulatory response band. So,  
3 we're going to get involved.

4 MR. JOHNSON: Good, good. I just wanted  
5 to add one thing to make suer that we leave you with  
6 the right impression. If, for example, an inspector  
7 comes across an issue, they do not not make an issue  
8 an issue because the licensee already found it.

9 If it's an issue, we set aside whether the  
10 licensee found. We look at that issue and treat that  
11 issue in our process.

12 Now, when we go out and we do our  
13 supplemental inspection, in the case where issues have  
14 crossed thresholds, then is when we would recognize  
15 what the licensee has done with respect to finding the  
16 issue, and correcting the issue, and so on, and so  
17 forth.

18 But there's no -- there's no provision --  
19 well, inspectors do not -- you won't see one of the  
20 questions in the screening questions that is, has the  
21 licensee already found it, or is it already in the  
22 corrective action program? That's not the -- we don't  
23 want licensees -- we don't want inspectors thinking  
24 about those kinds of things.

25 But again, what Doug has said is true; we

1 don't want inspectors also -- we also don't want  
2 inspectors living in the licensee's corrective action  
3 program where they're simply, Doug's words, minding  
4 the corrective action program, looking through them  
5 for issues that we can bring up and document as our  
6 own inspection reports.

7 MR. LEITCH: But the fact that you have  
8 few and declining numbers of non-white inspection  
9 findings would seem to indicate that that's happening  
10 anyway, right? The licensee must have 10 or 15 of  
11 these a day, issues entering the corrective action  
12 program.

13 CHAIRMAN SIEBER: That's about right.

14 MR. LEITCH: And many of those could be --  
15 could somehow be a non-white inspection finding. So,  
16 there must be a de facto going on, a kind of -- these  
17 many low level issues are just not even surfacing as  
18 non-white -- non-color issues.

19 MR. JOHNSON: Right, right. Yes, and  
20 that's what we mean when we say we don't want  
21 inspectors to mind the corrective action program.  
22 We think it's healthy for licensees to find their own  
23 issues, to put them in their corrective action  
24 programs.

25 And we don't -- we don't want a program

1 that discourages that by raising those -- pulling  
2 those issues out, raising them, documenting them, you  
3 know, just for the sake of getting greens on the  
4 docket.

5 CHAIRMAN SIEBER: On the other hand, even  
6 though an issue may be licensee-identified, if it is  
7 truly risk-important, you would still have enforcement  
8 action regarding that. For example, the failure of  
9 all emergency diesel generators to start or load, even  
10 though the licensee may have discovered that and  
11 corrected it, it still is a matter for enforcement --

12 MR. JOHNSON: It still matters --

13 CHAIRMAN SIEBER: -- is that not correct?

14 MR. JOHNSON: Exactly, it still matters in  
15 the reactor oversight process. It's still something  
16 that we would take action on if they cross thresholds,  
17 including -- including, perhaps, enforcement.

18 CHAIRMAN SIEBER: Right, okay, thank you.

19 MR. COE: Right. At the moment, there's  
20 -- it doesn't matter who finds it or whether it's  
21 self-revealed. We'll assess its significance, and  
22 we'll utilize the action matrix accordingly.

23 CHAIRMAN SIEBER: Right.

24 MR. COE: Okay, that's the last example on  
25 no-color. The next example is a green inspection

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1 finding. Again, this is under the reactor safety or  
2 the mitigation cornerstone -- mitigation systems  
3 cornerstone.

4 In this case, during the conduct of an  
5 inspection procedure that was looking at surveillance  
6 testing, inspectors identified that an RHR system  
7 bypass valve had been temporarily modified to be in  
8 its full-open position.

9 However, the licensee hadn't done any  
10 evaluation following that modification as to assure  
11 that the technical specification flow requirements  
12 were being satisfied.

13 However, the subsequent evaluations that  
14 the licensee performed showed that the system flow did  
15 meet its surveillance test requirements.

16 Okay, now, this differs somewhat because  
17 -- from the previous examples because there was a  
18 definite impact, is considered to be a definite  
19 impact, on the cornerstone; in other words, a safety  
20 function or a function of a component was affected.

21 The flow was reduced. There was an  
22 impact, a physical change, a difference. And it was an  
23 adverse difference. It was the flow is less, okay?

24 When screened through 0610\* questions that  
25 we discussed briefly before, this conclusion is drawn:

1 that it did affect the mitigating systems cornerstone  
2 and, therefore, its disposition would be, again, just  
3 as before, to confirm that the issue had been entered  
4 in the licensee's corrective action program.

5 In addition, since it did affect the  
6 cornerstone, we would proceed to do a phase one SDP  
7 analysis. And the question that the phase one SDP  
8 asks in this particular instance is whether or not the  
9 system function had been affected, but whether -- not  
10 only had -- did the system function -- was the system  
11 function affected, but was operability and design  
12 function maintained?

13 That's one of the questions. In fact,  
14 that's the first question that is asked of an issue in  
15 the mitigating systems cornerstone and when it enters  
16 the -- this SDP.

17 And in fact, if that answer is yes, that  
18 operability and function were maintained, the issue  
19 screens, at that point, as green. And the licensee is  
20 expected to correct that, or the conditions, the  
21 underlying conditions, which caused that.

22 But we would not engage further with any  
23 further inspection of its root causes or, you know, we  
24 would leave that up to the licensee.

25 MR. LEITCH: Would a notice of violation



1 have been issued in this case?

2 MR. COE: That's a good question. I don't  
3 know the answer to that. I'd have to go back to the  
4 inspection report. I didn't -- that didn't jump out  
5 at me.

6 MR. LEITCH: Just another similar  
7 question: is a non-color synonymous with a non-cited  
8 violation?

9 CHAIRMAN SIEBER: No.

10 MR. LEITCH: Are those two categories --

11 MR. COE: No. A green -- a violation  
12 which is given green significance is going to  
13 normally, in almost all cases, be given a non-cited  
14 violation.

15 MR. JOHNSON: Yes, that's true.

16 MR. LEITCH: Yes, okay. But a no-color is  
17 always a non-cited?

18 MR. COE: Well, if a no-color finding  
19 arises because of willfulness or an issue which  
20 significantly impedes regulatory process such that we  
21 would consider it -- you know, we may consider for a  
22 severity level enforcement action up to, and  
23 including, civil penalties.

24 MR. LEITCH: But it would still be a no-  
25 color?

1 MR. COE: But it would still be a no-  
2 color.

3 MR. LEITCH: I see, okay.

4 MR. JOHNSON: Yes, we're sort of a little  
5 squeamish on answering the questions, your specific  
6 questions, only because -- and I'm looking at Steve.  
7 Steve is not even looking at me now because he knows  
8 that we're having an ongoing dialogue with the Office  
9 of Enforcement on this issue.

10 And in fact, one of the things I intend to  
11 do when we come in July is bring the Office of  
12 Enforcement along with us because I think we ought to  
13 be able to talk about -- to address your questions  
14 about what enforcement also comes out.

15 But to be quite honest, with respect to  
16 what is a no-color finding, Doug is exactly right.  
17 There are issues -- there are issues that receive  
18 traditional enforcement.

19 And the Office of Enforcement doesn't  
20 consider those to be no-color findings. And I don't  
21 want to make this -- I don't want to make this overly  
22 convoluted, but let me just say that we have to --  
23 we're still working with how we -- with this whole  
24 topic of no-color findings and how we eventually end  
25 up with respect to what is a no-color finding.

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1                   When we set up the action matrix early on,  
2 we intended that there would be two kinds of things.  
3 There would be things that you could run through the  
4 SDP that would receive a color, and that color was  
5 synonymous with where they would fit, that we could  
6 run through the action matrix and come up with a  
7 result.

8                   It was also the recognition that severity  
9 levels would still apply for things that received  
10 traditional enforcement that were -- that is, things  
11 that were outside of -- things that could impede the  
12 regulatory process.

13                  For example, those would receive --  
14 willful violations, those would receive traditional  
15 enforcement. So, you could have a situation where you  
16 have a finding that -- you'd have a collection of  
17 things: things that receive colors, things that  
18 received a severity level, right?

19                  And so, it's not as -- and so, when you  
20 ask a question, do all no-color findings -- are all  
21 no-color findings NCVs, well, that really depends on  
22 how you define a no-color finding with respect to how  
23 you treat these traditional enforcement items under  
24 that definition of no-color findings.

25                  In July, we'll have our act together

1 because we will have -- we will have closed the loop  
2 on the dialogue with respect to no-color findings, and  
3 we'll be able to answer that.

4 So, if you can hold whatever questions you  
5 have for that --

6 MR. COE: All right, the next example is  
7 the white inspection finding. In this case, an oil  
8 leak was identified by an inspector on an emergency  
9 feedwater pump. This is in a pressurized water  
10 reactor which had, over a period of time, forced the  
11 operators to make daily oil additions in order to even  
12 maintain visibility in the oiler.

13 And when the residents had questioned  
14 this, the ultimate answer, the licensee determined  
15 that there were some bolts on the bearing housing that  
16 had been loose. The oil had been leaking into a drain  
17 sump, so it hadn't been puddling on the floor.

18 So, it was basically, you know, not  
19 gathering the kind of attention perhaps that it  
20 should, other than the fact that the operators were  
21 adding oil every day.

22 Ultimately, it was found that if the pump  
23 had been called upon to operate, it would have only  
24 run for a few hours. And then, the bearing oil would  
25 have gone away, and the pump bearing would have --

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1 would have become irreparably damaged, and that that  
2 condition occurred for 39 days.

3 Once again, the 0610\* documentation  
4 threshold was met because it did affect a mitigating  
5 system cornerstone. The pump was actually inoperable,  
6 unavailable, for that 39-day period of time.

7 Now, again, it would have operated for a  
8 few hours, but from a -- from the standpoint of a  
9 significance determination, the going in assumption  
10 was that it would not meet its mission time. It would  
11 not have satisfied its safety function in the long-  
12 term.

13 Phase one SDP, another one of the  
14 questions that the phase one SDP asks is whether or  
15 not an actual loss of function of a single train has  
16 occurred. And the threshold that's put on that is if  
17 it's greater than its tech spec allowed outage time.

18 And that's not necessary a risk-informed  
19 threshold, but it is a threshold that has -- we have  
20 historically used, even in the Accident Sequence  
21 Precursor Program.

22 And we have borrowed it and continued its  
23 use in this program.

24 DR. APOSTOLAKIS: Are these questions in  
25 this Appendix B?

1 MR. COE: No, these particular questions  
2 -- in phase one, now we have left 0610\*, which is  
3 essentially the documentation threshold and the  
4 discussion of no-color findings. And now, we've  
5 entered 0610, Appendix A, which addresses the  
6 significance determination for reactor safety  
7 findings, okay?

8 And in that document, you would find a --  
9 in fact, you're going to see it in just a moment -- a  
10 worksheet that lists these questions for phase one --  
11 for the phase one SDP process.

12 And this question -- my only point here is  
13 that's the question which kicks this issue into a  
14 phase two. In other words, if there was an actual  
15 loss of safety function and it was greater than tech  
16 spec allowed outage time, and therefore, it is  
17 deserving of further attention, further analysis; not  
18 that it wouldn't come out potentially green upon  
19 further analysis, but we can't say that for sure right  
20 now. And it needs to be looked at further.

21 Again, in an overall sense, we have a  
22 graduated approach here. Phase one is a relatively  
23 broad screening process that allows an inspector to  
24 assess that something is not -- does not need further  
25 analysis or review from a risk standpoint, that they

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1 can call it green.

2 They don't have to accept that, by the  
3 way. The guidance that we have put out is that if an  
4 inspector wants to exercise a phase two process,  
5 they're more than welcome to do that. And in fact, we  
6 encourage it, even if they think it's a green, because  
7 that starts them and continues them into the process  
8 of gaining risk insights into that particular issue  
9 and, in fact, into that plant in general.

10 But in this particular example, that's the  
11 screening question that's relevant, and it forces the  
12 next phase of SDP analysis.

13 Now, the next phase of SDP analysis is  
14 phase two. And I've got a more detailed set of  
15 documents here that we can look at. But the high-  
16 level picture of the phase two analysis is the  
17 following. The worksheets are utilized that are  
18 plant-specific.

19 We've created inspection notebooks, risk-  
20 informed inspection notebooks, which contain a series  
21 of worksheets. And the purpose is to identify what  
22 this impact has had on the dominant accident  
23 sequences.

24 DR. APOSTOLAKIS: Now, why dominant?

25 MR. COE: Because that's what drives the

1 risk. That's what drives the significance. In other  
2 words, the question that we're asking is which -- for  
3 this particular degradation, this particular  
4 deficiency, what effect has that had on the sequences,  
5 the accident sequences?

6 Which sequences were affected by that  
7 particular degradation, and how much remaining  
8 mitigation capability was left to mitigate those  
9 accident sequences?

10 DR. APOSTOLAKIS: But if you have a  
11 problem somewhere that affects a system that does not  
12 appear, say, in the top five sequences, but affects,  
13 you know, the following seven, what happens then? I  
14 mean --

15 MR. COE: Okay, it's a good question.  
16 Your question sort of infers that we're only listing  
17 the dominant accident sequences for review. In fact,  
18 the sequences are written at a very high level. Any  
19 one sequence is essentially a functional sequence.

20 The sequence that's represented here,  
21 which was the one that came up the highest, when you  
22 look at it as far as what's changed, is a transient  
23 with a loss of power conversion system, essentially  
24 loss of the main condenser and the turbine, followed  
25 by a loss of all the other emergency feedwater

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1 components.

2 And therefore, you have a loss of function  
3 of emergency feedwater, followed by a loss of primary  
4 feed and bleed. Now, that's the sequence --

5 DR. APOSTOLAKIS: How can you lose feed  
6 and bleed?

7 MR. COE: Well, you didn't in this case.  
8 In this case, the only thing that was affecting that  
9 sequence was EFW, the EFW pump.

10 DR. APOSTOLAKIS: You mean you lose the  
11 capability to feed and bleed?

12 MR. COE: This is simply a functional  
13 accident sequence. The end result of this sequence  
14 occurring is core damage, okay?

15 DR. APOSTOLAKIS: Right.

16 MR. COE: So, what we're doing is we've  
17 got a whole bunch of sequences listed in the  
18 worksheets. And the idea is which of those sequences  
19 was affected by a -- in other words, what changed?  
20 Which sequence baseline value for that core damage  
21 frequency risk contribution has changed?

22 Well, this one changed because this one  
23 used to have two motor-driven pumps and a turbine-  
24 driven pump. It now, for a period of 39 days --

25 DR. APOSTOLAKIS: Has one.

1 MR. COE: -- there is only one motor-  
2 driven pump and one turbine-driven pump. So, that's  
3 the change that has occurred, okay?

4 DR. APOSTOLAKIS: Right.

5 MR. COE: So, this element has changed;  
6 the other two have not. And they retain their  
7 original baseline assumptions on frequency of this  
8 event occurring and likelihood or probability of this  
9 loss of function occurring as well.

10 This essentially is providing defense in-  
11 depth. And the remaining mitigation capability that  
12 remains here is providing us a defense in-depth to  
13 sustain reactor safety --

14 DR. APOSTOLAKIS: So, do you have --

15 MR. COE: -- even when you had this  
16 problem.

17 DR. APOSTOLAKIS: Do you have those sheets  
18 here and --

19 MR. COE: Yes.

20 DR. APOSTOLAKIS: -- the information that  
21 the inspector has?

22 MR. COE: Yes.

23 MR. JOHNSON: Yeah, I was going to tell  
24 you that Doug has -- you are actually going to go  
25 through those sheets, aren't you?

1 MR. COE: We'll go through them in as much  
2 detail as you wish.

3 CHAIRMAN SIEBER: That's going to take a  
4 long time.

5 MR. COE: This is just the high level  
6 treatment. I'm giving you the answer. And then, as  
7 you have interest --

8 DR. APOSTOLAKIS: Wait a minute --

9 MR. COE: -- we'll go through the details  
10 of how we get there.

11 DR. APOSTOLAKIS: So, all these, pages 16,  
12 17, 18 --

13 MR. COE: Yes.

14 DR. APOSTOLAKIS: -- 19 -- do you want to  
15 get to that right now or --

16 CHAIRMAN SIEBER: No, I think that what we  
17 -- what our best bet is to continue and finish with  
18 the overall explanation as to what went on. And then,  
19 we can take a break and come back and --

20 DR. APOSTOLAKIS: Okay, good, good.

21 CHAIRMAN SIEBER: -- dive into the  
22 details.

23 MR. COE: Okay, the -- what comes out of  
24 the analysis essentially, for this particular  
25 sequence, is that you have to define what the

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1 likelihood of the initiating event is.

2 And actually, it's -- we have a table, and  
3 I'll show it to you. And we've characterized bands of  
4 likelihood, which are essentially probabilities, with  
5 the letter characters that represent those bands.

6 In this case, this is the highest  
7 frequency. In other words, this -- what this  
8 represents is, is that the initiating event frequency  
9 is greater than one in ten years, and the exposure  
10 time is greater than 30 days.

11 So, the likelihood of this event occurring  
12 within the 39-day period of time is characterized as  
13 "A". We'll get into what that -- a little more detail  
14 of what that means later.

15 In addition, the mitigating system credit  
16 that I was talking about earlier, there were two  
17 remaining motor-driven -- I'm sorry, there was one  
18 remaining motor-driven emergency feedwater pump left.

19 So, the mitigation credit for that  
20 function here is two, which is a representation of  
21  $10^{-2}$  likelihood that that remaining motor-driven pump  
22 would not be available, plus one, which is  
23 representing the turbine-driven emergency feedwater  
24 pump availability of -- in this case "1" represents  
25  $10^{-1}$  likelihood that it would not be available.

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1                   So, those are added, two plus one here.  
2                   And then loss of feed and bleed, normally we give feed  
3                   and bleed about a  $10^{-2}$  credit for unavailability. And  
4                   in this case, that's represented by this "2".

5                   So, you add these up and you get "5". You  
6                   don't assume that you can recover that damaged pump  
7                   should it have been called upon to function. And so,  
8                   you are left with a credit -- a mitigation system  
9                   credit of five.

10                  When combined with the likelihood rating  
11                  of "A," you enter another table and you end up with a  
12                  significance result of white, which is a  
13                  representation of a change in core damage frequency  
14                  because that pump, that one pump, is degraded for  
15                  those 39 days. The change is between  $E^{-6}$  and  $E^{-5}$  per  
16                  year, okay?

17                  DR. APOSTOLAKIS: So, the credits are  
18                  really the exponents?

19                  MR. COE: Yes, that's essentially the  
20                  negative log rhythm of the unavailability figure --

21                  DR. APOSTOLAKIS: Good.

22                  MR. COE: -- the baseline unavailability  
23                  figure.

24                  CHAIRMAN SIEBER: And I guess that's on  
25                  page 23, right, how you get -- you know, the --

1 MR. COE: Page 23?

2 MR. JOHNSON: Yeah, we'll get -- we'll get  
3 there.

4 MR. COE: Yes, page 23 is the table which  
5 actually produces the final result --

6 CHAIRMAN SIEBER: Right.

7 MR. COE: -- for that sequence, okay?  
8 Now, phase three -- you know, it's acknowledged, and  
9 it was acknowledged right at the very start, that  
10 phase two is a crude process.

11 Its value is that it's in the hands of the  
12 inspector, who is the closest person to the actual  
13 plant design, plant operation, and can be the best  
14 person suited to identify if any of the assumptions  
15 that are being used in this level of analysis are  
16 incorrect. And that's --

17 DR. APOSTOLAKIS: What is -- I'm sorry.  
18 What is the CDF of this particular plant? Do you know  
19 the baseline CDF?

20 MR. COE: I think it's about  $3E^{-5}$  or  $4E^{-5}$   
21 per year based on their IPE. And I don't know if  
22 that's been updated.

23 DR. APOSTOLAKIS: So, this is one-tenth of  
24 a --

25 MR. COE: Pardon?

1 DR. APOSTOLAKIS: The change was one-tenth  
2 of that, right?

3 MR. COE: It's in that range, yes. It's  
4 in that range of  $10^{-6}$  to  $10^{-5}$  per year.

5 DR. APOSTOLAKIS: Right.

6 MR. COE: Right. The phase three process  
7 was an acknowledgement -- the need for it was an  
8 acknowledgement that there would be occasions -- yes?

9 DR. APOSTOLAKIS: Is yellow or white  
10 worse? Which one is worse?

11 MR. COE: Yellow is worse.

12 DR. APOSTOLAKIS: Yellow is worse?

13 MR. COE: Yes, by an order of magnitude.

14 MR. JOHNSON: And red is worse even.

15 DR. APOSTOLAKIS: Yeah, I knew that.

16 (Laughter.)

17 MR. COE: So, phase three was essentially  
18 an acknowledgement that risk analysts would have to  
19 probably get involved at some point to either confirm  
20 that a phase two analysis was correct, that the  
21 assumptions were appropriate, and that the analysis  
22 was producing an answer that was defensible, or it may  
23 be that the SDP, itself, the phase two worksheets --  
24 there are certain cases where the SDP worksheets will  
25 not work.

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1 For example, if a component is not  
2 considered totally unavailable, but a deficiency has  
3 reduced its reliability, the phase two worksheets  
4 won't work.

5 The only way to assess that is through the  
6 use of adjusting the -- you know, making some  
7 judgement about the change in reliability, and then  
8 processing that through a computer-based model.  
9 That's the only way to do it.

10 So, there are occasions when phase three,  
11 we anticipate, would be needed and, for the most part,  
12 because the worksheets have been so delayed in coming  
13 out. For the first year of operation -- of  
14 implementation for ROP, we've done a lot of phase  
15 three analyses.

16 And we're hoping to relieve the burden  
17 somewhat on the risk analysts that have been doing  
18 these analyses by the implementation of these  
19 worksheets.

20 CHAIRMAN SIEBER: I presume the region  
21 analyst is doing the phase three evaluation and the  
22 licensee is doing it with their own PRA at the same  
23 time. And the chance of the answers being exactly the  
24 same are probably nothing.

25 MR. COE: There's always differences.



1 CHAIRMAN SIEBER: So, how do you resolve  
2 that?

3 MR. COE: Well, we talk about them and  
4 understand what the differences are. In many cases,  
5 the licensee is making assumptions that, you know, at  
6 least initially, we are not necessarily willing to  
7 accept.

8 So, the process allows for us to come  
9 forward with a preliminary analysis and put it on the  
10 table and then, in fact, offer the licensee the  
11 opportunity to come back in a formal way, through a  
12 formal, docketed process, a public meeting, to come  
13 back and give us further information, upon which then  
14 we can make a final decision.

15 We don't have to come to consensus with a  
16 licensee in order to produce an SDP result. But we do  
17 offer the licensee the opportunity to provide us with  
18 as much information as they feel is pertinent so that  
19 we can make a well-informed decision.

20 CHAIRMAN SIEBER: So, this would be a  
21 matter for an enforcement conference if one were to  
22 occur?

23 MR. COE: We call it a regulatory  
24 conference, yes.

25 CHAIRMAN SIEBER: Right, okay.

1 MR. COE: And the purpose is primarily to  
2 gather the information that we need to make our final  
3 assessment.

4 CHAIRMAN SIEBER: Okay, thank you.

5 MR. COE: Right. I would point out that,  
6 in many cases -- and this is an ongoing issue for us.  
7 And how we do this better is to account for the  
8 external initiating event contributions.

9 As you're aware, the level of detail and  
10 sophistication and, in fact, the complexity -- because  
11 of the complexity of external initiating events is --  
12 we don't have as much information as we have for the  
13 internal events.

14 And so, we do the best we can with the  
15 information we have. But in some cases, it has to be  
16 a fairly qualitative judgement as to whether or not  
17 there's a contribution that would affect the analysis  
18 results.

19 In this particular case, an enforcement  
20 action was issued as a notice of violation, or will  
21 be. Again, this hasn't come to completion yet. But  
22 the expectation that this kind of a violation would be  
23 a cited violation, okay?

24 Earlier, we were talking about the non-  
25 cited violations at the lower-significance levels.

1 When an issue of -- when a finding reaches the white  
2 or above significance level, then NCVs are not an  
3 option under our program.

4 We cite the violation. We require the  
5 licensee to respond in writing on the docket.

6 CHAIRMAN SIEBER: Now, when you issue a  
7 cited violation -- and let's not use this as the  
8 example, but just in general -- you still have the  
9 levels under -- like you had under the old enforcement  
10 policy? How do you determine what level you're in?

11 MR. JOHNSON: Actually, when -- for an  
12 issue like this that you've been able to run through  
13 the SDP, we've set aside those levels.

14 CHAIRMAN SIEBER: Okay.

15 MR. JOHNSON: The significance is given by  
16 the color of the finding. And because it is an issue  
17 that's associated with a violation, it is a cited  
18 violation.

19 So, with respect to the ROP and things you  
20 can run through the SDP, in general, we don't have  
21 severity levels. In general, you don't have civil  
22 penalties.

23 And I'm saying "in general," because if  
24 you had a situation where there was some actual  
25 consequence, it is possible to have a color, to also

1 -- but then again, run it through and assign a  
2 severity level and, in fact, issue a civil penalty.

3 But in general, for most violations, we're  
4 talking about a color and a citation if it's a  
5 violation.

6 CHAIRMAN SIEBER: That's enough, right?

7 MR. JOHNSON: Yes.

8 CHAIRMAN SIEBER: Okay, thank you.

9 MR. JOHNSON: Okay, that's actually --  
10 that's the high level treatment of SDP for the reactor  
11 safety. I would also point out that you're going to  
12 hear a little more detailed treatment of a fire  
13 protection example a little bit later.

14 The fire protection example has an entire,  
15 separate appendix that they work through. But then,  
16 the outcome of that is an input to these kinds of  
17 worksheets, these SDP worksheets that we've been  
18 seeing here.

19 So that there's some initial work that has  
20 to be done in order to process a degraded fire barrier  
21 issue, that type of issue. And we'll get to that a  
22 little bit later.

23 Now, I don't know if you wanted to take a  
24 break now, because what I would be prepared to do is  
25 to go into some more detail on this particular white

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1 finding issue -- example.

2 CHAIRMAN SIEBER: I think right now would  
3 be an appropriate time to take a break, at least for  
4 me. And let's reconvene at 10:30.

5 (Whereupon, the proceedings went off the  
6 record at 10:10 a.m. and resumed at 10:30 a.m.)

7 CHAIRMAN SIEBER: I think we can resume at  
8 this time. Mike?

9 MR. COE: Okay, I'd just like to walk  
10 through some of the details of the white inspection  
11 finding example that I showed you a moment ago. We'll  
12 go into whatever amount of detail that you care to.

13 The first part of an SDP in the reactor  
14 safety arena is a clear documentation of the  
15 condition. Factually and for the purposes of  
16 establishing exactly what the impact was on plant  
17 risk, we have to not include hypothetical situations,  
18 such as single-failure criteria.

19 So, we basically ask the inspectors to  
20 document factually what the condition is. We also ask  
21 them to think about the systems that were affected,  
22 the trains that were affected, the licensing basis or  
23 the design basis of the system.

24 That's sometimes not necessarily the whole  
25 story because it might have risk-significant functions

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1 that go beyond the design basis of the system. But at  
2 least as a matter of completeness, we wanted to ensure  
3 that that function was articulated. And that's done  
4 here on this sheet.

5 Maintenance rule category is important  
6 when we ask some of the questions in the next -- in  
7 the next part of the phase one process. In the time  
8 that the identified existed, or is assumed to have  
9 existed, is important, again, from the standpoint of  
10 the final risk determinations because it's one of the  
11 influential inputs.

12 So, this is just a more complete  
13 description of the identified finding that I  
14 illustrated earlier at a high level.

15 So upon documentation that you saw there,  
16 the inspector is given a worksheet that looks like  
17 this to help them identify if, in fact -- or which  
18 cornerstone was affected.

19 At this point, the decision had been made  
20 already that a cornerstone was affected. And based on  
21 the earlier questions, it's anticipated that it would  
22 be the mitigation systems cornerstone.

23 But this worksheet lays out all three  
24 cornerstones in the -- or three of the cornerstones in  
25 the reactor safety strategic area, and asks the

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1 inspector to clearly identify what, exactly, is the  
2 cornerstone of concern.

3 In some cases, it might be a combination  
4 of cornerstones. It might be -- a single issue might  
5 affect both an initiating event frequency, as well as  
6 a mitigation system cornerstone. But this is just to  
7 lay out the assumptions.

8 And I would point out that the  
9 documentation expectations for the SDPs in this area,  
10 and in other areas across the board, across all  
11 cornerstones, are expected to be clear and  
12 reproducible, such that an individual member, a  
13 knowledgeable member, of the public could take the  
14 inspection report and the description of the  
15 significance basis and take our guidance documents,  
16 such as Manual Chapter 0609, the SDP process, and  
17 arrive at the same conclusion, so that it's  
18 reconstructible -- the basis is reconstructible.

19 Okay, so that's -- here again, the  
20 mitigation cornerstone is the one that we're -- it  
21 should be this -- this next sheet here should be the  
22 next one in your package. I hope it is.

23 CHAIRMAN SIEBER: No.

24 MR. COE: It's not? Well, go to the next  
25 page, then. We might have reversed these two.

CHAIRMAN SIEBER: Page 18.

MR. COE: Okay, yes, page 18 is this sheet here. And it's actually the next one after the one I just showed. Here, the inspector is given a series of questions to determine whether or not the issue can be screened as green at this point and processed accordingly, or whether it needs a further treatment which may, or may not, result in a higher level of significance, but at least warrants the further treatment in phase two.

In the case of mitigating systems -- mitigation systems, the inspector asks these series of questions. If the issue had impacted the initiating event cornerstone or the containment barrier, part of the barrier cornerstone, then you would ask -- he would ask these questions.

In this particular example, the feedwater -- the emergency feedwater pump example, the first question was, is the finding a design qualification deficiency that does not affect operability? The answer is no, it did affect operability.

And so, you go to the next question: is the finding an actual loss of safety function for a system? Well, that was defined in the first page, what the system was.

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1           The system, in this case that was  
2 affected, was the emergency feedwater, and the whole  
3 system had not been lost. So, the answer to that  
4 question is no.

5           The third question is, does the finding  
6 represent actual loss of the safety function of a  
7 single train of a system for greater than a no-tech  
8 spec AOT?

9           And this gets to the criteria that I  
10 indicated earlier, causes this to be answered yes.  
11 And therefore, we go to a phase two analysis. In  
12 other words, there is a need to look at this issue in  
13 further detail to assess its significance.

14           The other page that's labeled 17 is not --  
15 is not used at this point in the process because it  
16 deals with external initiating events. And it's a set  
17 of screening questions that would be used at the end  
18 of this process.

19           If this process established a level of  
20 significance above green, then we would come back and  
21 we would look at these questions, and determine  
22 whether or not, either qualitatively or  
23 quantitatively, depending on the information we had  
24 available, whether or not external initiating events  
25 were a contributor to this significance.

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1 But we'll -- we can come back to that  
2 after we finish the internal event treatment.

3 Now, each plant -- basically, now we have  
4 established the assumptions that we're going to be  
5 using in utilizing the various worksheets in the risk-  
6 informed, plant-specific inspection notebooks, which  
7 include these phase two worksheets.

8 This table here represents, for this  
9 particular plant, the initiating event frequencies for  
10 all of the initiating events that would be subject to  
11 consideration by this SDP.

12 And this table basically requires the  
13 inspector to -- and there's another table that will  
14 help in just a moment. But this table allows the  
15 inspector to determine what the initiating event  
16 likelihood is for the period of time, the exposure  
17 time, for the degraded condition.

18 So, in this case, 39 days is this column  
19 here, this first column. And as we will find out --  
20 I have already -- like I said, I've already given you  
21 the answer.

22 But as we will find out, the initiating  
23 event that prompts the sequence of greatest interest  
24 here is one that has a -- starts with a reactor trip  
25 with a loss of power conversion. So, that's this

1 initiating event here.

2 The assumption -- the going-in assumption  
3 of its frequency is in this range. And since it's a  
4 30 -- greater than 30-day period, that's why it  
5 resulted in this estimated likelihood rating of "A,"  
6 which represents, once again the likelihood that that  
7 event will occur within that period of time. Okay,  
8 and we can come back to that as need be.

9 Now, how does the inspector know which  
10 sequences he needs to examine in order to assess which  
11 have been affected by this particular problem?

12 Well, the affected system; that is, the  
13 system that has the problem, is emergency feedwater.  
14 And this table, which again is specific to each plant,  
15 each plant's design, and is incorporated into that  
16 plant-specific notebook -- this would indicate that  
17 the EFW system, which is composed of two motor-driven  
18 pumps and one turbine-driven pump, appears as a  
19 mitigation function in all its initiating event  
20 sequences, with the exception of medium LOCA, large  
21 LOCA and loss of instrument air.

22 So, in other words, the inspector's next  
23 task is to pull all of the worksheets out -- and we'll  
24 be going through a couple of those in a moment -- that  
25 -- except for these, okay? Because in all of those

1 other worksheets, EFW appears as a mitigation  
2 function.

3 And so, it has now been affected. So,  
4 therefore, the likelihood of those sequences occurring  
5 has been affected. And then, ultimately, we're going  
6 to seek to answer the question, how much have they  
7 been affected, okay?

8 The next -- the next two pages are just a  
9 continuation of that table.

10 CHAIRMAN SIEBER: Now, these are plant-  
11 specific; is that not correct?

12 MR. COE: What I've gone through so far is  
13 all in the plant-specific, risk inform notebook.

14 CHAIRMAN SIEBER: Okay.

15 MR. COE: One is generated. There's about  
16 70 or so such notebooks that are either developed or  
17 in the final, the very final, stages of development.  
18 And they cover all 103 operating reactors.

19 CHAIRMAN SIEBER: All right. This table  
20 here is a generic table. It appears in our overall  
21 guidance document for the reactor safety SDP in Manual  
22 Chapter 0609, Appendix A.

23 And what will happen here is that for  
24 those sequences that the inspector has identified as  
25 having been impacted, each sequence will be given an

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1 initiating event likelihood based on the particular  
2 initiating event for that sequence.

3 And then, each sequence will be judged in  
4 terms of the remaining mitigation capability that  
5 remains given that this one aspect of its mitigation  
6 -- of the mitigation function is unavailable.

7 And depending on how much mitigation  
8 function capability remains -- again, this is  
9 remaining mitigation capability -- and these are just  
10 examples. They're not a complete set of examples;  
11 they're just examples -- then, for that sequence,  
12 we'll generate a color.

13 And the color will reflect the delta core  
14 damage frequency change associated with that sequence  
15 on an order of magnitude basis. Okay, so we'll come  
16 back to this table as well.

17 In fact, I would suggest you maybe put a  
18 marker in that because we'll want to refer to that as  
19 we go through the analysis.

20 This is the first worksheet that -- and,  
21 in fact, is the one that had the white sequence in it  
22 that I identified as dominating this particular  
23 analysis.

24 The worksheet is -- the way it's laid out  
25 is the first row up here, the first line, carries

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1 forward information that has already been determined  
2 from the previous tables.

3 This comes from that first table, and it  
4 indicates that this particular initiating event  
5 frequency is found in row one of that table, and that  
6 the exposure time assumption was that it was -- that  
7 -- from that table was greater than 30 days, and that  
8 that result was "A," as we saw, okay?

9 Now, this next section of the table  
10 defines what these mitigation functions are that  
11 appear in these accident sequences. Again, these are  
12 high-level functional accident sequences.

13 So, for each function, such as EFW, EFW  
14 will be described in terms of the plant components  
15 that are available to mitigate that -- to provide that  
16 function in order to mitigate that initiating event.

17 And this is describing the full,  
18 creditable mitigation capability for each of these  
19 safety functions. So, this is as much credit as you  
20 can take for that safety function for that particular  
21 plant.

22 In the case, in the specific case, of  
23 emergency feedwater, again emergency feedwater, in  
24 this plant, can be achieved -- the safety function can  
25 be achieved -- with any one of two motor-driven EFW

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1 trains and that the two of them together, therefore,  
2 comprise a one, multi-train system amount of credit.

3 And there's a numerical value associated  
4 with that credit, and we'll talk about that in just a  
5 second -- in a minute.

6 In addition, the turbine-driven EFW train,  
7 there's one. And it is a full, 100 percent capable  
8 train. So, one of one of that train is also capable  
9 of providing the full function.

10 Now, in addition, there's -- there needs  
11 to be steam relief on the secondary side through  
12 either one out of two ADVs -- that's atmospheric dump  
13 valves -- or one out of 20 safety valves, okay?

14 And that's -- that's a necessary -- that's  
15 there basically to -- for completeness. It doesn't  
16 really factor into the credit because you have so many  
17 options there.

18 What you're really limited by is the ways  
19 of putting feedwater into those steam generators.

20 Okay, now, looking down here at these  
21 three sequences that are listed, we see that EFW  
22 appears in all three sequences. Therefore, all three  
23 sequences have be affected by this degradation, by  
24 this problem.

25 So, treated individually, we say how much

1 mitigation capability remains for each affected  
2 sequence? In the case of EFW, we have one motor-  
3 driven EFW pump remains, and one train, one electro-  
4 mechanical train, is given a credit of two, that it  
5 represents  $10^{-2}$  unavailability.

6 Okay, a turbine-driven emergency feed  
7 pump, because it's a -- what we call an automatic,  
8 steam-driven train, we have only given it a credit of  
9 one,  $10^{-1}$ , unavailability.

10 So, there's one in ten chances that that  
11 turbine-driven EFW pump would not function upon  
12 demand. But there's one in 100 chances that the  
13 motor-driven EFW pump would not function upon demand.

14 And that's based on our generic insights  
15 in terms of the differences between electro-mechanical  
16 train reliability and steam-driven train reliability.  
17 So, that's the amount of credit we're willing to give  
18 in this particular, rough analysis.

19 The other function that's associated that,  
20 if it were to fail along with these other failures or  
21 events, would lead to core damage is high pressure  
22 recirculation.

23 The high pressure recirculation function  
24 is achieved through -- you know, for -- and I said  
25 "high pressure," so it's the high pressure function --

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1 is achieved through one out of two high-pressure  
2 injection trains, which, in this case, there's a note  
3 here indicating that there are actually three pumps  
4 for two trains -- taking suction from one out of two  
5 low pressure injection trains. And all of this  
6 requires operator action.

7 Now, in order to assess the value or the  
8 credit that's given to that function -- and remember,  
9 that function has not been impacted by this  
10 deficiency. So, we're going to give full credit.

11 You'll notice that, for the EFW, we only  
12 gave the credit that was remaining. The fact that the  
13 other motor-driven pump was degraded or unavailable is  
14 reflected by the fact that it does not appear as  
15 credit for mitigation capability.

16 In the case of high pressure recirc, there  
17 has been no impact on that function. And therefore,  
18 full capability is creditable. How much credit is  
19 that?

20 In this case, operator action essentially  
21 is the most restrictive feature because if operator  
22 action doesn't occur, the function will not be met.

23 And there is guidance in our 0609 document  
24 that describes how that should be treated. In this  
25 case, we give credit of three, which represents  $10^{-3}$

1 likelihood that operators will not successfully  
2 implement high pressure recirculation.

3 If you sum those numbers up -- oh, and  
4 this column right here, failure -- recovery of the  
5 failed train, in each of these cases of an identified,  
6 actual impact, the question often arises, can the  
7 issue or can the degradation be recovered by an  
8 operator action?

9 For example, if this had not been a  
10 bearing oil problem; if it had been a switch left in  
11 the wrong position and an operator in the control  
12 room, based on indications, could identify that and  
13 recover from that deficiency, then credit for that  
14 recovery might be warranted.

15 We give credit under -- only under certain  
16 meeting -- if the action would meet certain specific  
17 criteria, which are actually listed on this worksheet  
18 in the next -- in the next slide.

19 But in this particular case, we are not  
20 giving any operator recovery credit because our going-  
21 in assumption is that the bearing will fail, and it  
22 will fail catastrophically.

23 And therefore, there's not time available  
24 to recover from that. So, the function is completely  
25 lost.

1 Now, the sum of these, if our math is  
2 correct, should be six. And that value of six is the  
3 mitigation credit for that sequence. And if you go  
4 back to the table, page 23, that we had up there just  
5 a moment ago, that sequence had an initiating event  
6 likelihood and a remaining mitigation capability of  
7 six, which is this column.

8 So, that puts it in green. But notice  
9 that green is right next to a white, so we're high  
10 green, okay? I'm not going to use dark green or  
11 light green.

12 (Laughter.)

13 But clearly, we're up there -- we're less  
14 -- we're about an order of magnitude away from a  
15 white. And that may be significant later, so -- and  
16 we'll talk about that in a minute.

17 The second sequence is treated the same  
18 way. In this case, early inventory high-pressure  
19 injection is satisfied by a multi-train system up here  
20 indicating one out of two high-pressure injection  
21 trains -- again, there's three pumps, but there's two  
22 trains. And that injects from a borated water storage  
23 tank.

24 One multi-train system is given a credit  
25 of three, and that represents the combination of the

1 individual components, the individual train  
2 reliabilities, plus the added factor of a possible  
3 common-cause problem mode.

4 So, at a high level -- in other words, if  
5 it was -- if it was two independent trains, totally  
6 independent, each train would have a credit of two.  
7 And you could add those together if they were two  
8 independent and diverse trains to get four for our  
9 total mitigation credit.

10 But if the two trains are identical and  
11 they're part of a multi-train system, then you can't  
12 -- you can't just add those up without accounting for  
13 the potential for common-cause failures.

14 And when you add that in, that drops you  
15 back to about a  $10^{-3}$  in a rough sense. So, that's the  
16 basis for that. So, that also, then, is given a  
17 credit of three, which differs in basis from what we  
18 gave up here, because up here, it was based on  
19 operator action. Down here, it was just simply based  
20 on the electro-mechanical train unavailabilities.

21 Again, it produces a remaining mitigation  
22 capability rating of three -- of six, excuse me. And  
23 we're still dealing with the same initiating events,  
24 so we're still dealing with "A".

25 And if you go back to the table, it's

1 identical to what we had there before; again, green,  
2 and I've added here next to white. "NTW" stands for  
3 next to white.

4 Now, the third sequence is the one of  
5 interest, and this is the one that I represented  
6 earlier on the high-level slide.

7 The EFW credit is the same as before. In  
8 this case, the feed and bleed credit -- if we look at  
9 the feed and bleed function up here -- or in this  
10 case, it's defined as primary bleed because it really  
11 is based upon the availability -- not only operator  
12 action, but the availability of bleed sources.

13 Similar to what I described up here for  
14 high-pressure recirc, the things that drives this  
15 credit here is operator action.

16 And for feed and bleed, primary feed and  
17 bleed, we allow a credit of about  $10^{-2}$  likelihood of  
18 not succeeding. And so, that credit of two is what is  
19 represented here; and when summed, gives five total,  
20 which, again, if you go back to the table that I  
21 showed earlier, would get you into a white range.

22 DR. APOSTOLAKIS: So, if the operator  
23 credit is one, what would happen to this finding? It  
24 would be what color?

25 MR. COE: Well, if you -- if you assume

1 that for feed and bleed, that operators were only --  
2 you were only comfortable, for whatever reason, giving  
3 operators credit of  $10^{-1}$  likelihood of --

4 CHAIRMAN SIEBER: It would be red.

5 MR. COE: -- of failure, you would be in  
6 the next -- you would go to the next color up, right?  
7 Because this would be one; this total would be four.

8 DR. APOSTOLAKIS: So, it would be yellow.

9 MR. COE: White would go to yellow.

10 DR. APOSTOLAKIS: Now, that -- you know,  
11 the operator actions of this kind, you know, it is  
12 very difficult to quantify the probability because  
13 it's not the probability of failure. It's the  
14 probability of failure to decide to do it, hesitation,  
15 all that.

16 So, I mean, what would that mean now?  
17 This is independent of the -- of the violation or the  
18 finding, right?

19 MR. COE: This is independent of the  
20 violation, but it's assumption that is used as part of  
21 the significance determination.

22 DR. APOSTOLAKIS: But your action, though,  
23 from the enforcement matrix, would be different; I  
24 mean, white versus yellow, right? And the full plant  
25 will be penalized depending on assumptions that have

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1       been somewhere else.

2               MR. COE:   That's right.

3               DR. BONACA:   For example, in this case,  
4       you do have -- in the simulator training, they are  
5       begin trained to enter into the --

6               DR. APOSTOLAKIS:   It's not a matter of  
7       doing it correctly. It's a matter of deciding to --

8               DR. BONACA:   Absolutely, and that is  
9       always absurd -- that is always absurd how fast they  
10      get into it. I mean, that sequence -- so, there is  
11      information available on-site.

12              DR. APOSTOLAKIS: No, but you remember the  
13      Davis Bessie thing where --

14              DR. BONACA:   I understand that, but --

15              DR. APOSTOLAKIS: -- economic consequences  
16      were huge.

17              DR. BONACA:   Oh, yeah.

18              DR. APOSTOLAKIS: So, I don't know that  
19      the  $10^{-2}$  is on solid ground. I mean --

20              DR. BONACA:   No, I'm with you. I mean,  
21      there is information -- at least in later years, I  
22      know that there is a of emphasis on are they doing it  
23      or not.

24              MR. COE:   And I would point out that, on  
25      the next page, which is a continuation of this table,

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1 there's a note that we've added that indicates that  
2 based on the license -- this particular licensee's  
3 IPE, the human error probability for this function  
4 that they used, in their own analysis, was  $3.4 \text{ E}^{-2}$ ,  
5 all right?

6 So, we're not far off. But the main point  
7 that I want to make here, I think, is that all of --  
8 you know, your point is exactly right. The objective  
9 here is to come up with what was the impact on risk?

10 And we use a core damage frequency risk  
11 matrix as the means of getting to that answer. And  
12 it's all based on a lot of assumptions. And what  
13 we're trying to do here is to bring these assumptions  
14 out into the open so that they can be examined.

15 And again, the inspectors, very often, are  
16 the persons who are in the best position to point to  
17 an assumption and say, "I know that's not true. I  
18 know that's not right."

19 We want the analysis to represent the  
20 truth, as best we know it. And in order to get those  
21 assumptions out on the table, we're using this kind of  
22 process. And we're asking the inspectors to go  
23 through the same kind of thinking process that would  
24 prompt them to think well, have I seen any problems in  
25 the simulator with feed and bleed?



1                   Is there any evidence that there's a  
2 problem in this area that I can't -- that this  
3 assumption should really be one instead of two, and  
4 that maybe the color should be yellow instead of  
5 white.

6                   DR. FORD: I'm a material scientist, and  
7 therefore, used to making a hypothesis and examining  
8 it with fact. This is a very logical approach, but is  
9 there any way of going aback and double-checking it  
10 against experience, actual, factual experience?

11                  MR. COE: In terms of do we have a  
12 database --

13                  DR. FORD: Yes.

14                  MR. COE: -- of operator performance?

15                  DR. FORD: Yes. I mean --

16                  DR. APOSTOLAKIS: I think you are talking  
17 about the whole approach, and not just operations, are  
18 you?

19                  DR. FORD: Exactly. I mean --

20                  DR. APOSTOLAKIS: The whole SDP?

21                  DR. FORD: For instance, your whole --  
22 this whole table is based on input in item one.  
23 You're putting a "1" in that top, left estimated  
24 frequency.

25                  MR. COE: Yes.

1 DR. FORD: What happens if it was a  
2 different frequency basically you've got a time-  
3 dependent degradation or whatever it might be?

4 MR. COE: Sure.

5 DR. FORD: How would that -- is there  
6 anything that you can double-check these estimates,  
7 reasonable although they may be, against observations?

8 MR. COE: Well, actually, yes. The basis  
9 for the -- for instance, the initiating event  
10 frequencies that we're using comes from a study that  
11 was completed a couple of years ago by -- it started  
12 out by AEOD, and then became research.

13 But these assumptions -- you know, the  
14 order of magnitude that we chose to use for these  
15 various initiating events actually came out of an  
16 initiating event study, which is published in a new  
17 reg.

18 It represents the best insight that this  
19 Agency has, based on operating experience that has  
20 been gathered over the years as to what we expect the  
21 generic frequency of those events to occur at.

22 Now, it's important that the inspector  
23 understands that these are assumptions. And when  
24 they're applied to their specific plant, that specific  
25 plant's experience may differ. But the assumption of

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1 where -- where we're starting out assuming that that  
2 initiating -- that frequency is, or what the  
3 mitigating system reliability is, is starting out with  
4 a generic value.

5 And those assumptions are exposed through  
6 this process and thereby, allow the inspector to  
7 challenge them if, based on their own knowledge and  
8 understanding of that plant, they feel that they  
9 aren't true.

10 DR. FORD: So, when you say you have 70 of  
11 these documents going out, which cover all 103  
12 operating stations, they may well change, depending on  
13 the history of that particular plant?

14 MR. COE: Well, we --

15 DR. FORD: Bad water chemistry control or  
16 whatever it might be?

17 MR. COE: Well, I think that -- yes, well,  
18 what you're saying is that the plants will change over  
19 time. They may modify the plant. The reliability of  
20 certain equipment may change over time based on issues  
21 or problems.

22 What we've tried to do here is establish  
23 these starting values at a more or less conservative  
24 level.

25 DR. FORD: Okay.

1 MR. COE: We think we've got a more or  
2 less conservative set of assumptions here for most  
3 things. And we're continuing to monitor the process  
4 to identify, you know, areas where something might  
5 come up and we might identify that our assumptions may  
6 not be as conservative as we expected.

7 And so -- but in general, we think that if  
8 this process renders -- and I don't mean that --  
9 whenever you do risk analysis, you really shouldn't be  
10 using conservative assumptions, right?

11 You should be trying for the best, most  
12 reasonable assumptions possible because conservative  
13 assumptions can often, you know, cause the results to  
14 skew and may obscure other things that you're  
15 interested in.

16 And so, we're not trying to be over-  
17 conservative in our assumptions, but the numbers we're  
18 using are based on systems studies, for example, such  
19 as that are generated by research now: ox-feed water,  
20 diesel generator systems.

21 They've gathered information from LERs and  
22 other databases, and they've done statistical  
23 analyses. And the numbers that we're using, such as  
24 a credit of  $10^{-2}$  for a single, electro-mechanical  
25 train, a credit of  $10^{-1}$  for a automatic steam-driven

1 train, come from -- or at least are checked against --  
2 the results of those studies.

3 DR. FORD: Okay.

4 MR. LEITCH: Now, could you go back to  
5 slide 24 for just a second?

6 MR. COE: Sure.

7 MR. LEITCH: I have a question about how  
8 you get the "2" in the column there that's labeled  
9 "remaining mitigation capability" --

10 MR. COE: Yes.

11 MR. LEITCH: -- "2 motor-driven emergency  
12 feed pump". Where does that "2" come from? I guess  
13 my question is, is this all pre-printed on this sheet,  
14 or is this the result of this specific --

15 MR. COE: No. Actually, it's a good  
16 question. There is a -- and I apologize; there is a  
17 separate table that's in 0609 that defines the credit  
18 given to a multi-train system. In fact, it defines a  
19 multi-train system.

20 MR. LEITCH: Okay.

21 MR. COE: And the credit that's given to  
22 a single train -- or in cases where operator action  
23 comes into play, the credit is actually given right  
24 here because operator action credit will change from  
25 sequence to sequence, you know?

1                   So, we don't -- we don't try to define  
2                   that in a table. We put it right up here.

3                   MR. LEITCH: Okay.

4                   DR. APOSTOLAKIS: So, Doug, you said  
5                   earlier -- but let's confirm it once again -- all of  
6                   these tables are plant-specific?

7                   MR. COE: Yes, the tables that I'm  
8                   representing here are plant-specific.

9                   DR. APOSTOLAKIS: And the numbers?

10                  MR. COE: Yes.

11                  DR. APOSTOLAKIS: The credits?

12                  MR. COE: Well, the numbers are -- start  
13                  out to be generic, such as a credit of two for a  
14                  single train, and one for an automatic steam-driven  
15                  train. And the frequency of initiating events started  
16                  out to be what was represented in the new reg study  
17                  that research provided.

18                  As we've gone through the process of  
19                  asking licensees for comment, they may have provided  
20                  us with some additional information upon which we can  
21                  make a decision that we should alter that initiating  
22                  event frequency, or that we should alter that  
23                  mitigating system function, or that we should alter  
24                  that operator reliability, HEP value.

25                  DR. APOSTOLAKIS: Have many licensees

1 actually asked you to make these more plant-specific  
2 by submitting such requests?

3 MR. COE: Licensees typically gave us a  
4 lot of information that they felt was more accurate  
5 for their plant. You know, I think in almost every  
6 case, every licensee gave us feedback that they felt  
7 was better reflective of their plant.

8 Now, we didn't accept that carte-blanche,  
9 obviously. And in fact, there is some advantage to  
10 sort of staying with some more generic assumptions as  
11 a start.

12 Now remember, I said there was a phase  
13 three process too. If our phase two tool is a little  
14 bit over-conservative, we're willing to accept that  
15 because it's expected that if the phase two results  
16 are challenged by the licensee because they have a  
17 better analysis, and typically they will, then we'll  
18 get into a more detailed level of analysis that would  
19 -- would, then, have to account for some of the more  
20 specific differences that the licensee was using  
21 relative to our assumptions.

22 DR. APOSTOLAKIS: But the determination of  
23 the color is not on a generic basis, correct?

24 MR. COE: The determination of the color  
25 comes directly from this analysis and these

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1 worksheets, based on the plant-specific assumptions.

2 DR. APOSTOLAKIS: No, but I mean you have  
3 a matrix somewhere that tells you that a five, right,  
4 is a white? That was --

5 CHAIRMAN SIEBER: Page 23.

6 DR. APOSTOLAKIS: Yeah, yeah.

7 MR. COE: Well, relative to that  
8 particular initiating event likelihood.

9 DR. APOSTOLAKIS: Right, but it's -- this  
10 is not plant specific.

11 MR. COE: This table right here is not  
12 plant-specific, that's correct.

13 DR. APOSTOLAKIS: It is not plant-  
14 specific?

15 MR. COE: Yes, that's correct.

16 DR. APOSTOLAKIS: It appears to me it  
17 should be; I mean, because a plant-specific nature is  
18 already in the -- is it possible that the same number  
19 at one plant should be a green and another should be  
20 yellow? Does that make sense?

21 MR. COE: It could make sense if the  
22 plants' designs for the green plant had more  
23 mitigation capability than the one that had the yellow  
24 plant -- or, I mean, the yellow finding.

25 DR. APOSTOLAKIS: No, but I said the same



1 number. If you had more mitigation ability, the  
2 number would not be the same.

3 MR. COE: Well, if the number.

4 DR. APOSTOLAKIS: You wouldn't get the  
5 same number.

6 MR. COE: If the number was the same, the  
7 color would be the same. The color is representing  
8 the band, an order of magnitude wide, and that doesn't  
9 change. That is a -- that is a threshold, a set of  
10 thresholds, that is consistent with the PIs, and is  
11 essentially fixed.

12 DR. APOSTOLAKIS: But --

13 DR. SHACK: But this is really sort of  
14 giving you an exponent on CDF. So, I mean, it really  
15 goes back to 1174. And so, it is the same for all  
16 plants.

17 DR. APOSTOLAKIS: No, but 1174 uses a  
18 fundamental input, the baseline -- so, no, I'm not  
19 saying that it should be. It just occurred to me that  
20 the decision on the color is generic, but the input  
21 into the matrix is plant-specific.

22 And I'm wondering whether this is  
23 consistent -- self-consistent. I mean, but I hadn't  
24 thought about it.

25 MR. COE: Well, you raised the point about

1 baseline CDF. And our metric here, remember, is the  
2 change in CDF. We're not referencing these colors to  
3 any baseline, any particular baseline CDF. They are  
4 referenced only to the change --

5 DR. APOSTOLAKIS: Right.

6 MR. COE: -- delta core damage frequency  
7 and delta LERF.

8 DR. APOSTOLAKIS: But even in 1174, when  
9 the baseline CDF is greater than  $10^{-4}$ , we drop the  
10 delta --

11 MR. COE: Yes.

12 DR. APOSTOLAKIS: -- by another magnitude.

13 MR. COE: Right. For permanent changes to  
14 the plant --

15 DR. APOSTOLAKIS: Permanent changes.

16 MR. COE: -- that may be appropriate.

17 DR. APOSTOLAKIS: Yes.

18 MR. COE: These are performance  
19 deficiencies that have resulted in temporary  
20 degradations.

21 DR. APOSTOLAKIS: Now, do you see a time  
22 in the future where all this will be computerized?

23 MR. COE: Good question. Maybe.  
24 Initially --

25 DR. APOSTOLAKIS: Maybe you see a time, or

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1 maybe there will be?

2 (Laughter.)

3 MR. COE: It is possible. My thoughts  
4 are, it is possible that this is an intermediate step  
5 along the way to the use of -- the employment of more  
6 sophisticated risk tools by field inspectors.

7 The challenge that we face today, and we  
8 have faced over the past few years when we've tried to  
9 risk-inform our processes, even before ROP, is that  
10 inspectors -- we were not able to give inspectors  
11 sufficient training to allow them to utilize the  
12 computer-based tools effectively that had been  
13 developed, all right?

14 We established the SRA Program, the Senior  
15 Reactor Analyst Program, in 1995 in order to begin to  
16 get at that need. And it took almost two years of  
17 training before the SRAs were really, fully qualified.

18 This is a way of accommodating the needs  
19 of ROP while, at the same time, in a very  
20 complimentary way, giving inspectors a better risk-  
21 informed perspective of their particular plant, and of  
22 the risk -- of the probabalistic framework that is, in  
23 many cases, not something that they had to deal with  
24 day-to-day in the past.

25 They deal with a very deterministic

1 framework of compliance-oriented and the -- the  
2 decisions as to what was important and what was not  
3 were based on their own experience and the various  
4 pressures that were brought to bear by their own  
5 management, but the licensee, and by the public or  
6 outside stakeholders.

7 So, what we've tried to do here, and as  
8 we've said repeatedly, is to come up with a more  
9 predictable and objective tool. And this is -- the  
10 risk metric is the way we've chosen to do that.

11 But the inspectors have a challenge of  
12 understanding better the assumptions and the  
13 limitations of the risk tools that we employ. And so,  
14 this is -- this is the way of accomplishing that.

15 MR. JOHNSON: And I would only add that my  
16 -- the way I respond to your question, George, is to  
17 say that we think -- we think there is something that  
18 is valuable with having inspectors, at this stage,  
19 work through these sheets.

20 And in the future, for efficiency purposes  
21 or for accuracy purposes, it might make sense to  
22 computerize it. But today, we think this -- we get --  
23 we get maximum benefit in terms of enabling inspectors  
24 to understand not just what the significance is, but  
25 working through why it's significant.

1 DR. APOSTOLAKIS: I fully agree with you  
2 that we can view this as a training period where  
3 people really understand what PRA is all about. But  
4 at the same time, as you know, the Office of Research  
5 is putting all the IPEs into a -- so far, they're  
6 calling is SPAR?

7 MR. COE: Yes.

8 DR. APOSTOLAKIS: So, after we have a SPAR  
9 model for each unit, maybe that would -- and that will  
10 not happen tomorrow, so --

11 MR. JOHNSON: Right.

12 MR. COE: No. In fact, you know, we're  
13 struggling -- I know Research is struggling with the  
14 level of effort and the amount of resources that they  
15 can devote to completing the work on the more  
16 sophisticated -- the next revision to those computer-  
17 based models.

18 But even once they're completed -- you  
19 know, even once they're written, an important aspect  
20 of that is to go out and check them against licensee  
21 analysis results --

22 DR. APOSTOLAKIS: Sure.

23 MR. COE: -- and to make visits to the  
24 site to ensure that the assumptions that those models  
25 have in them are accurate.

1 And then, there's the question of ongoing  
2 maintenance of those models, and how much effort we're  
3 willing to put into that.

4 And then, there's a whole argument that  
5 says, well, maybe the licensees ought to just provide  
6 their own models for our use. And there's ongoing  
7 discussions at high levels regarding that.

8 So, how it all plays out in the end, I  
9 don't know. I hold out that there's a possibility  
10 that inspectors will become risk-informed enough to be  
11 able to use the tools if they exist, the computer-  
12 based tools.

13 But right now, I think the agents -- not  
14 only the inspectors, but the management, the decision-  
15 makers in the Agency, need to have a process that  
16 forces the revelation of these assumptions as they  
17 make these decisions so that we can legitimately claim  
18 that we have a risk-informed process.

19 Because if all the assumptions are buried  
20 into computer models somewhere, and we're making the  
21 decisions based on the results coming out of a  
22 computer relative to some standard or some threshold,  
23 I'm not sure that I can call that risk-informed, okay?

24 MR. LEITCH: I think I may be getting  
25 mixed up a little bit between core damage frequency

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1 and change in core damage frequency. I guess my  
2 question basically on the next slide, 24 I guess it  
3 is. On that last example, could there be a scenario  
4 where normal operations gets a green?

5 DR. APOSTOLAKIS: Gets what?

6 MR. LEITCH: Gives a green. In other  
7 words, you're running along normally with three --  
8 with two -- you just had it there a minute ago.

9 MR. COE: Yes, slide 24, right?

10 MR. LEITCH: Slide 24, yeah. It's  
11 unnumbered.

12 DR. APOSTOLAKIS: Slide 24 is up there.

13 MR. COE: Oh, thank you.

14 (Laughter.)

15 MR. LEITCH: Say you had both motor-driven  
16 pumps and a turbine-driven pump, and you assume, say,  
17 one for feed and bleed. Does that give you a green  
18 indicator in normal operations?

19 MR. COE: Well, first of all, you only  
20 look at these if they've been changed. So, if a  
21 baseline contribution of a particular sequence -- the  
22 baseline contribution of all full mitigation  
23 capability is potentially white, okay?

24 I don't think that happens very often, but  
25 it's possible, right?

1 MR. LEITCH: Yes.

2 MR. COE: Because white represents a  
3 single, functional sequence that contributes anywhere  
4 from  $10^{-6}$  to  $10^{-5}$ . You know, and most core -- most  
5 plant baseline CDFs are between  $10^{-5}$  to  $10^{-4}$ .

6 But the point is, is that you only look at  
7 this if there has been a change.

8 MR. LEITCH: Okay.

9 MR. COE: Now, the theory --

10 MR. LEITCH: But if you just --

11 MR. COE: Philosophically, what happens  
12 is, if you're only looking at the sequences that have  
13 changed, if we were to look at the core damage  
14 frequency with the change, we would add all the  
15 baseline sequences, the ones that didn't -- weren't  
16 affected.

17 MR. LEITCH: Okay.

18 MR. COE: And then, when we subtract off  
19 the baseline, all of those go away. All those  
20 sequences go -- the contribution to all those  
21 sequences goes away. So, all we're left with is the  
22 one that changed.

23 MR. LEITCH: That changed, yes, yes.  
24 Okay.

25 MR. COE: So, that's -- theoretically,

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1 that's how we can call this delta CDF.

2 DR. APOSTOLAKIS: So, this is really CDF-  
3 oriented not LEFT?

4 MR. COE: Well, we haven't talked about  
5 LERF yet. But the LERF -- the significance standard  
6 for LEFT is essentially one order of magnitude more  
7 sensitive than for delta CDF.

8 DR. APOSTOLAKIS: But you do have the  
9 tables and everything?

10 MR. COE: Right. We just -- this issue  
11 didn't impact that, so we're not talking about that  
12 today.

13 DR. APOSTOLAKIS: Yes.

14 MR. COE: Okay, so this is only one of  
15 several worksheets. Now, I mentioned that,  
16 essentially, the guidance for this example was that  
17 all the worksheets had to be looked at, with the  
18 exception of a few LOCA worksheets.

19 DR. APOSTOLAKIS: I wonder if you have --  
20 I mean, one of your cornerstones is emergency planning  
21 --

22 MR. COE: Yes.

23 DR. APOSTOLAKIS: -- which is beyond LERF?

24 MR. COE: Yes.

25 DR. APOSTOLAKIS: So, how would you go

1 back?

2 MR. COE: We have a separate significance  
3 determination process specifically designed to address  
4 findings coming out of emergency preparedness  
5 inspections.

6 DR. APOSTOLAKIS: So, you're using level  
7 there results?

8 MR. COE: No, it's more -- the logic of  
9 that SDP is more related to the nature of the  
10 deficiency that caused the problem.

11 DR. APOSTOLAKIS: It's not risk --

12 CHAIRMAN SIEBER: It's determined risk.

13 MR. COE: Correct. It's really -- you  
14 can't really claim it to be risk-informed, although  
15 what we've tried to achieve with all of these other  
16 cornerstones that you can't link directly to core  
17 damage frequency or delta LERF metrics, is a  
18 consistent response.

19 The Agency's response is commensurate with  
20 the type of deficiency that has occurred. And it is,  
21 I think in the formulation of those SDPs, somewhat  
22 more subjective.

23 But what we're trying to achieve is the  
24 same goal, the same level of consistency.

25 CHAIRMAN SIEBER: Okay.

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1 MR. COE: Okay?

2 CHAIRMAN SIEBER: And you have the same  
3 situation in physical security, right?

4 MR. COE: Yes, right. In fact, you know,  
5 as you're probably aware, we made an attempt early-on  
6 to incorporate risk-informed processes -- a risk-  
7 informed SDP process into the physical security SDP,  
8 particularly -- specifically for assessing the  
9 significance of force-on-force exercises.

10 And that proved to be unworkable. And I  
11 -- you know, I was involved in trying to make it work,  
12 and I, and others, were just simply not successful.  
13 You know, there's too many differences from a -- you  
14 know, when you're talking about risk in terms of  
15 sabotage events and the level of intent that -- you  
16 know, and all of the variations that can occur in  
17 terms of recoverability of things under fairly  
18 stressful conditions.

19 It just wasn't workable, so we're  
20 redefining that now.

21 CHAIRMAN SIEBER: Okay.

22 MR. COE: Okay. The other sequences that  
23 I thought I would show you -- I haven't gone through  
24 all of them here. But the other ones that came out,  
25 not white, but rather there was another sequence that

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1 came out green, you know, right next to white, was a  
2 loss of off-site power sequence.

3 In this case, I just wanted to point out  
4 that the loss of off-site power initiating that  
5 frequency is in a different row in table one. It's in  
6 row two.

7 Exposure time, of course, is the same.  
8 It's greater than 30 days. But the result now, if you  
9 look on that table, is "B," which represents a less  
10 frequent initiating event.

11 Now, that means that you don't have to  
12 have quite as many mitigating -- quite as much  
13 mitigation capability on the average for that  
14 initiating event as you would for the one in the  
15 higher frequency category.

16 And that -- that affects, you know, in a  
17 probabalistic way, what the outcome of the  
18 significance is.

19 So, in this case, we look at EFW again.  
20 These have been affected, and the choices that are  
21 made here, in terms of remaining mitigation  
22 capability, are exactly what we've described before.

23 In fact, even for this particular  
24 sequence, the feed and bleed is also the same. And in  
25 fact, that sequence, other than the initiating event,

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1 is exactly the same as the one that got us the white.

2 Okay, in this case, because the LOOP  
3 frequency is less than that transient without loss of  
4 PCS frequency, this -- this value of five, instead of  
5 getting us a white because we drop down one on the --  
6 on this table here -- we're in the -- the LOOP is a  
7 "B" likelihood here. And we come over here to five,  
8 and we're green next to white, okay?

9 Now, you probably realize already that a  
10 real PRA sums all of these contributions up. And what  
11 we're dealing with here is sequence-by-sequence. And  
12 we're saying the most dominant sequence, you know, is  
13 the one that drives the color.

14 But in fact, we acknowledge and recognize  
15 that an accumulation of sequences at lower levels may  
16 sum up to something greater than the threshold that we  
17 have set for green and white.

18 And the way we accommodate that in a phase  
19 two level in the courser treatment that we give a  
20 phase two, is to establish a summing rule. And the  
21 summing rule says that if you have more than two of  
22 these sequences that are green next to white, then you  
23 should call that a white, okay?

24 Now, that is a somewhat arbitrary choice,  
25 but we thought it was a reasonable one, at least to

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1 start with. And that's not to say that if you even  
2 had two greens next to white that that wouldn't, or  
3 shouldn't, prompt maybe a more thorough analysis,  
4 which is, you know, often easy to do with either our  
5 own tools or utilizing the licensee's analysis, okay?

6 So, all I'm saying is that we recognize  
7 that that's a limitation of this particular phase two  
8 level of detail, and we've tried to account for that.  
9 And that, if nothing else, gives inspectors -- you  
10 know, reminds inspectors that that's really what's  
11 going on here, that there's a potential for  
12 aggregating, or summing I should -- you know, summing  
13 these lower level issues to something that was of  
14 greater significance.

15 Okay, that actually completes the  
16 documentation that I had to show you and the example,  
17 unless there's any other questions about what we've  
18 done.

19 MR. JOHNSON: Now, we're at a point in the  
20 presentation where we'd like to get into the fire  
21 protection SDP if that's possible. Does that fit?

22 CHAIRMAN SIEBER: That fits with me.

23 MR. JOHNSON: Okay. J.S., Mark, guys,  
24 would you come up and join us?

25 MR. HYSLOP: Hey, Doug, I think you've got

1 my transparencies.

2 MR. COE: They're up here, yes.

3 MR. JOHNSON: Would you like me to flip  
4 for you or --

5 MR. HYSLOP: Hi, my name J.S. Hyslop, and  
6 I was the co-developer of the fire protection SDP,  
7 which was developed over a year ago. And Pat Madden  
8 and I -- I'm in PRA -- Pat Madden, a fire protection  
9 engineer, also developed this. We did it together.

10 And Pat has since moved on. And now, Mark  
11 Salley, beside me, is now responsible for the fire  
12 portion of the fire SDP.

13 This first slide indicates that I'm going  
14 to give an overview in the presentation. Basically,  
15 it's just the general remarks that are going to be  
16 overview.

17 From that point on, we're going to get  
18 into an example with a specific application of the  
19 fire SDP on a set of fire protection findings we had.

20 And so, in that -- don't move on yet,  
21 Mark, I'm going to talk about the identification of  
22 the findings and -- clear identification of the  
23 findings.

24 We're going to talk about the fire  
25 scenario, and there -- a realistic fire scenario where

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1 we, of course, have to take into consideration the  
2 figuration of the room as well as the findings  
3 themselves.

4 And then, we're going to apply the SDP to  
5 estimate a color and talk about the basis for the  
6 degradation, as well as the failure probabilities  
7 used. Go ahead.

8 I want to make some general remarks to  
9 just give you some insight into what we're doing with  
10 the process, as well as some information about it.

11 We're using techniques and data generally  
12 accepted by the fire risk community. What do I mean  
13 by the "techniques"? Well, the technique involved  
14 consideration of a fire ignition frequency, the  
15 defense in-depth elements, barrier suppression,  
16 etcetera, and mitigating systems.

17 We put all those together, using the  
18 appropriate probabilities, to get a change in core  
19 damage frequency. The date --

20 DR. APOSTOLAKIS: J.S., most utilities,  
21 the way I understand it, use the screening bounding  
22 methods like five in their IPEEEs. Would that --  
23 wouldn't that make it very difficult to calculate  
24 delta CDF in this context?

25 MR. HYSLOP: Well, what we're doing is



1 we're trying to look at realistic scenarios. So,  
2 we're actually using the emission frequency associated  
3 with the scenarios. And we have tools to evaluate the  
4 damage done by the fire, quantitative tools that we're  
5 developing now.

6 And you know, we're trying to estimate the  
7 damage -- as a result, we try to estimate the damage  
8 as reasonable as possible.

9 DR. APOSTOLAKIS: So, what you're saying  
10 is that you are going to be use the IPEEE to some  
11 extent?

12 MR. HYSLOP: We're using a lot of  
13 information out of the IPEEE, but we reserve the right  
14 to develop scenarios ourselves to disagree with those  
15 in the IPEEE because, you know, that's what our  
16 inspectors do.

17 They go out in the field. They look at  
18 the fire sources, and they make independent judgements  
19 themselves about the damage done. And I'm going to be  
20 talking -- my next point is that it's an evolving  
21 process.

22 And I'm going to give you some information  
23 that -- about some of the things we're working on to  
24 improve that right now.

25 So, it's an evolving process. We just

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1 released the second version of the SDP. It's my  
2 understanding that that was distributed to you by IPB.

3 And there, we've got some clarifications  
4 and just -- on identifying and evaluating realistic  
5 fire scenarios, as well as guidance to assist the  
6 inspectors to determine the degradation level  
7 associated with the weakness of our inspection  
8 finding.

9 We also have -- it's an evolving process,  
10 so we have future plans. First of all, we have a tool  
11 development to assist the fire protection inspectors  
12 to evaluate the effectiveness of manual actions  
13 specific to fire.

14 You know, you may have manual actions  
15 specific to fire because of evacuation of the control  
16 room, or you may have manual actions specific to fire  
17 because of heavy smoke being in the vicinity.

18 This project was -- we got a lot of help  
19 from Research on this. Nathan Siu was using the data  
20 available to him through the Fire Research Plan.

21 So, they provided the foundation. NOR has  
22 since looked at that and made some modifications to  
23 it. You know, the next step, of course, is to  
24 document this, and to go around with industry, get  
25 their feedback, as well as the other stakeholders,

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1 because that's the way the reactor oversight process  
2 works.

3 Another tool that we have under  
4 development, really by Mark Salley, is the development  
5 of a quantitative tool to estimate the fire damage as  
6 the result of a fire ignition source.

7 And Plant Systems is working on that now,  
8 and developing templates and a guide to use for the  
9 inspectors.

10 And so, the next step is, what are we  
11 doing with our stakeholders? Are we telling them  
12 about this? And yes, we are. There was a fire  
13 protection information forum held, I don't know, a  
14 while ago I attended. And I talked to them about  
15 these -- about these plans that we have for the fire  
16 protection SDP.

17 And then, there was the reactor oversight  
18 workshop, which was held a month or two ago, or so.  
19 And there, we had a fire protection break-out session  
20 where Mark and I attended, as well as some other fire  
21 protection people. Some SRAs came and, you know,  
22 industry came.

23 And we talked about, again, what we're  
24 doing. And we've been talking to industry the whole  
25 time, in response to your comment earlier. Throughout

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1 this development process, early on, before we even  
2 used it, we had many meeting with industry: with NEI,  
3 small meetings with industry where we had a couple  
4 hundred people there -- here. And we ran --

5 DR. APOSTOLAKIS: What do you call a large  
6 meeting then?

7 MR. HYSLOP: Well, I guess I would say --

8 DR. APOSTOLAKIS: More than a thousand?

9 MR. HYSLOP: No, no, no. There were a  
10 hundred people there. There were a hundred people.  
11 That's a large meeting for me. I come from a small  
12 town. So,

13 CHAIRMAN SIEBER: A thousand would be  
14 medium.

15 DR. APOSTOLAKIS: It's a medium.

16 MR. HYSLOP: Anyhow, the last point is, we  
17 have a state-of-the-art research plan going on ten  
18 floors -- being managed ten floors up, and Nathan Siu.  
19 And he's doing work on suppression. He's doing work  
20 on fire barriers.

21 And I've told him that I'm interested in  
22 the insights that he gains from his program because  
23 this is an evolving process. And likewise, I'm  
24 interested in your comments. Again, it's an evolving  
25 process.

1           Next. So, we're going to get into the  
2 example right off the bat. You know, as I said, this  
3 is based on fact.

4           We had an inspection, and the inspection  
5 identified several findings. The first finding is the  
6 suppression system, was a CO<sub>2</sub> system. I'm just going  
7 to tell you about these briefly.

8           Mark Salley, later in the presentation, is  
9 going to get into these in more detail and tell you  
10 his basis for our choosing a level of degradation  
11 associated with these findings, okay?

12          So, just briefly, the fixed suppression  
13 system wouldn't maintain the minimum concentration for  
14 the fire hazard. There's a minimum concentration  
15 required, and it was lower than that.

16          Also, there was a barrier problem. The  
17 electrical raceway fire barrier system protecting  
18 redundant trains didn't meet the one-hour rating. It  
19 was substantially less.

20          DR. APOSTOLAKIS: So, this was the same  
21 plant?

22          MR. HYSLOP: This is the same plant. This  
23 is the same room.

24          DR. APOSTOLAKIS: Oh, okay.

25          MR. HYSLOP: Okay? This is one hour. So,

1 you've got -- and I'm going to talk about the  
2 configuration, but you've got one room; you've got  
3 fire barriers in that room that are degraded.

4 And of course, you know the regulations:  
5 when you've got a one-hour barrier, you've got a fixed  
6 suppression system also in tandem. And that fixed  
7 suppression system responsible for protecting that  
8 barrier was also degraded, okay? Now --

9 CHAIRMAN SIEBER: Let me ask a question.

10 MR. HYSLOP: Yes.

11 CHAIRMAN SIEBER: Could you imagine a case  
12 where the lack of functionality of the suppression  
13 system would cause the degradation of the fire  
14 barrier, and therefore, you get basically two issues  
15 out of one defect?

16 MR. HYSLOP: Well, we look at these --  
17 I'll let Mark Salley answer that more fully. But we  
18 look at these synergistically in the analysis. We say  
19 that these two compound the problem in the analysis.  
20 And you'll see later in the slide how we do that. Do  
21 you want to respond, Mark?

22 MR. SALLEY: Yes, if I understand your  
23 question properly, are you saying the suppression  
24 system would degrade the barrier?

25 CHAIRMAN SIEBER: Right, or the lack of

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1 functionality of the suppression system. For example,  
2 here, was the fact that the fire barrier did not meet  
3 the one-hour rating independent of the fact that the  
4 suppression didn't maintain the concentration?

5 MR. SALLEY: That's an interesting  
6 question, and you take it all the way back to the  
7 barrier qualification, in and of itself. If you  
8 remember the whole thermal lag and the fire barrier  
9 issues, another one that came down the road was kao  
10 wool --

11 CHAIRMAN SIEBER: Right.

12 MR. SALLEY: -- which was a ceramic,  
13 fiber-type material.

14 CHAIRMAN SIEBER: Right.

15 MR. SALLEY: And there, the hose drain at  
16 the end of the fire exposure would be very important  
17 to have got its qualification that the hose stream  
18 wouldn't remove it. So, that should have been looked  
19 at, at a lower level in designing the system.

20 CHAIRMAN SIEBER: Okay. So, what you're  
21 saying is you do look at things in a synergistic  
22 basis?

23 MR. HYSLOP: Yes, that's one of the  
24 strengths of this method.

25 CHAIRMAN SIEBER: All right.

1 MR. HYSLOP: And then, the last -- the  
2 last thing we have to consider is the time of this  
3 degradation. If you remember in Doug's presentation,  
4 the time affects the change in CDF.

5 A lesser time -- since it's an annualized  
6 change in CDF, a lesser time has a less effect than a  
7 long time, okay? And we find that these findings  
8 existed greater than 30 days, and that's the largest  
9 range.

10 There, you have no reduction in CDF for  
11 the time, and they existed simultaneously. And that  
12 was determined during the inspection. Go ahead.

13 CHAIRMAN SIEBER: Another question: when  
14 you talk about the fire barrier, it could they used  
15 deficient material, or it could be the fire barrier is  
16 defective, like there's a hole in it.

17 In this case, which was it? And in  
18 general, do you treat them the same way, either  
19 deficient material versus a breach in the system?

20 MR. SALLEY: When you get into the actual  
21 evaluation, they would start falling in the same  
22 matrix of the degradation --

23 CHAIRMAN SIEBER: Okay.

24 MR. SALLEY: -- as to how degraded they  
25 are.



1 CHAIRMAN SIEBER: All right.

2 DR. APOSTOLAKIS: J.S., I didn't  
3 understand this argument about the 30 days. You say  
4 that was greater than the maximum, therefore --

5 MR. HYSLOP: Yes, there are three time  
6 ranges in the SDP: zero to three days, three to 30,  
7 and greater than 30. And the greater than 30,  
8 essentially, you assume you've got 300 or some days'  
9 degradation. It's a factor of one that's used in  
10 there.

11 So, you don't get a reduction in your core  
12 damage frequency if you're greater than 30 days, where  
13 you would get a reduction of ten if you're three to  
14 30, and a reduction of 100 if you're zero to three.

15 DR. APOSTOLAKIS: Okay.

16 MR. HYSLOP: Next slide. Now, I was  
17 planning to jump right into the phase two, but I'll  
18 talk about the phase one a little bit, although I  
19 really don't want to spend much time on it because  
20 it's not as important for this application.

21 Essentially, we recognize we have  
22 significant degradations in defense in-depth. We  
23 haven't talked about them, but you'll see that.

24 And this fire barrier and automatic  
25 suppression protect essential equipment, equipment

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1 that's on those sequences, and loss of would have a  
2 big effect. That, alone, will put you into the phase  
3 two process, so now I'm going to talk about the phase  
4 two.

5 The phase two, one of the earliest things  
6 we have to do is ask the following question: can we  
7 have a realistic fire scenario? You know, we've got  
8 a -- we've got a degradation defense in depth. Do we  
9 have a fire scenario that's going to challenge that?

10 And so, when you do that, you know, you  
11 have a knowledge of the degradations, and you, of  
12 course, need to have an idea of the configuration of  
13 the room. And I'm going to talk a little bit about  
14 that now.

15 This room was a 4160-vote essential switch  
16 gear room, so you had your safety-related switch gear.  
17 It was divided into three sections by partial-height  
18 marinite walls. These walls went nearly to the  
19 ceiling, but not all the way.

20 And so, you've got three sections, okay?  
21 So, in each one of those sections, you had an  
22 electrical train -- electrical bus of switch gear  
23 where you needed two buses to support one mechanical  
24 train. That's the way the plant was set up.

25 Now, if you had a fire in one of the far

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1 regions, then we still had too much of a train. So,  
2 you had a mechanical train of equipment. You really  
3 got into trouble if you had a fire in the center one  
4 because in the center, you had cables crossing over  
5 from each of those electrical trains, over the end of  
6 the center switch gear, okay?

7 CHAIRMAN SIEBER: And they went over the  
8 wall?

9 MR. HYSLOP: And they went -- yeah --

10 CHAIRMAN SIEBER: Okay.

11 MR. HYSLOP: -- over the wall; over the  
12 end, right.

13 CHAIRMAN SIEBER: Where the plume would  
14 be?

15 MR. HYSLOP: Right, right. So, you know,  
16 you've got a -- you've got an ignition source over the  
17 end. A fire starts there, develops a plume,  
18 potentially does damage. Mark is going to talk more  
19 about this. So, do you want to go ahead, Mark?

20 MR. SALLEY: Sure, this is a good time to  
21 pick it up. I'm Mark Salley from the Plant Systems  
22 Branch. Pat Madden originally had started this. I  
23 helped him a little bit. And Pat moved on, so I've  
24 been picking up a lot of the fire protection with J.S.  
25 from here on out.

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1 George made an important comment earlier  
2 about how this comes together. If you look back, the  
3 IPEEEs, Generic Letter 8820, Supplement 4, there is a  
4 starting point, especially for the people who used the  
5 five method.

6 And they said, "Hey, look, we've done a  
7 lot of work with Appendix R. So, from that Appendix  
8 R starting point, we'll take this snapshot in time,  
9 and we'll do this IPEEE."

10 From that IPEEE, the next progression is  
11 where J.S. and I are pretty much going. So, I think  
12 you can see, as we're moving along, that one bit of  
13 information is building on the previous one.

14 To just giver a little summary here of  
15 what J.S. is talking about, we have our three vital  
16 switch gear, 4160, the vital buses, the three fire  
17 barriers --

18 DR. APOSTOLAKIS: Is there a reason why we  
19 don't have this?

20 MR. SALLEY: Oh, I'm sorry. This was just  
21 an extra. I thought I'd give you --

22 MR. HYSLOP: We just made this one.

23 MR. SALLEY: -- a real quick -- a little  
24 more clarity.

25 DR. APOSTOLAKIS: How about a picture

1 being worth a thousand words and all that?

2 CHAIRMAN SIEBER: We'll pick up a copy.  
3 We'll get you a copy. He can make it available to all  
4 of you.

5 MR. SALLEY: The fire barrier separator of  
6 the marinite walls that J.S. spoke about, the area of  
7 concern is where the cables from the three merged over  
8 the center unit here, okay?

9 Now, in the Appendix R-type strategy for  
10 compliance, the requirement would say, okay, there's  
11 a number of ways to do this. This licensee chose to  
12 put one-hour fire-wrap, fire barriers, on those  
13 cables.

14 And the room is -- has a full, automatic  
15 suppression system; in this case, a manual CO<sub>2</sub> system.  
16 So, that was his method of compliance. As the  
17 inspectors looked at it --

18 CHAIRMAN SIEBER: I'm not sure how an  
19 automatic suppression system is a manual CO<sub>2</sub> system.

20 MR. HYSLOP: We're getting --

21 CHAIRMAN SIEBER: It sounds like it's  
22 manual.

23 MR. HYSLOP: We're going to get into that  
24 on the next slide.

25 MR. SALLEY: Yes, this licensee did have

1 a manual here --

2 MR. HYSLOP: Sorry about that.

3 MR. SALLEY: -- yeah, with this; you're  
4 correct.

5 CHAIRMAN SIEBER: But these are original  
6 design problems with the construction of this room,  
7 right?

8 MR. SALLEY: Right. This is unique to  
9 this licensee and --

10 CHAIRMAN SIEBER: So, this has existed  
11 forever?

12 MR. SALLEY: Yes.

13 CHAIRMAN SIEBER: Okay.

14 MR. SALLEY: When the inspectors were  
15 looking during their inspection, they found -- they  
16 inspected the hardware in the plant. They, first off,  
17 review the fire barriers.

18 In reviewing the fire barriers, what they  
19 determined was that they really weren't one-hour rated  
20 barriers as they --

21 CHAIRMAN SIEBER: Well, the walls weren't  
22 because they weren't full height.

23 MR. SALLEY: Well, the --

24 CHAIRMAN SIEBER: And the wrap probably  
25 had some other defect.

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