

**ORIGINAL**

**UNITED STATES OF AMERICA**  
**NUCLEAR REGULATORY COMMISSION**

**Title:** **BRIEFING ON FIRE PROTECTION ISSUES**  
**PUBLIC MEETING**

**Location:** **Rockville, Maryland**

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1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION

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4 BRIEFING ON FIRE PROTECTION ISSUES

5 \*\*\*

6 PUBLIC MEETING

7  
8 Nuclear Regulatory Commission  
9 One White Flint North  
10 Building 1, Room 1F-16  
11 11555 Rockville Pike  
12 Rockville, Maryland  
13

14 Tuesday, February 9, 1999  
15

16 The Commission met in open session, pursuant to  
17 notice, at 9:10 a.m., Shirley A. Jackson, Chairman,  
18 presiding.  
19

20 COMMISSIONERS PRESENT:

21 SHIRLEY A. JACKSON, Chairman of the Commission  
22 NILS J. DIAZ, Member of the Commission  
23 EDWARD McGAFFIGAN, JR., Member of the Commission  
24 GRETA J. DICUS, Member of the Commission  
25 JEFFREY S. MERRIFIELD, Member of the Commission

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1 STAFF PRESENT:

2 JOHN C. HOYLE, Secretary

3 KAREN D. CYR, General Counsel

4 ANNETTE L. VIETTI-COOK, Assistant Secretary

5

6 PRESENTERS:

7 WILLIAM TRAVERS, Executive Director for Operations

8 LEDYARD B. (TAD) MARSH, NRR

9 BRIAN SHERON, NRR

10 STEVEN WEST, NRR

11 STEVE REYNOLDS, NRC Region III

12 ED CONNELL, NRR

13 ALAN RUBIN, RES

14 RALPH BEEDLE, NEI

15 ANTHONY O'NEILL, NFPA

16 DAVID MODEEN, NEI

17 PAUL GUNTER, Reactor Watchdog Project, Nuclear

18 Information and Resource Service

19 DAVID LOCHBAUM, Union of Concerned Scientists

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

[9:10 a.m.]

CHAIRMAN JACKSON: Good morning, ladies and gentlemen. I am pleased to welcome you today for a briefing on fire protection issues for nuclear power plants. The Commission will be briefed by the NRC Staff, who are at the table, the Nuclear Energy Institute, the National Fire Protection Association, the Union of Concerned Scientists and the Nuclear Information and Resource Service.

In October, 1996 the Commission directed the Staff to revise 10 CFR 50.48 and to modify or remove Appendix R. The last Commission briefing on these efforts was in March of 1998, which focused on the Staff's proposal, as discussed in SECY 98-058, for development of a risk-informed performance-based regulation for fire protection at nuclear power plants. In the Staff Requirements Memorandum dated June 30th, 1998 the Commission approved the Staff recommendation to defer development of a risk-informed, performance-based fire protection rule and instead pursue with the National Fire Protection Association and the nuclear industry the development of a risk-informed and ultimately performance-based consensus standard for fire protection at nuclear power plants.

The Commission could then endorse the standard if successfully developed in a future rulemaking which would

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1 serve as an alternative method to meet NRC fire protection  
2 requirements.

3 Since that March, 1998 Commission meeting the  
4 Staff has forwarded several information papers to the  
5 Commission on fire protection issues such as status reports  
6 on the Fire Protection Functional Inspection Program and  
7 progress made in the development of fire protection  
8 consensus standard, and insights from Research on fire  
9 protection.

10 Today's briefing will cover this information and  
11 in particular revisions to Appendix R and 10 CFR 50.48,  
12 development of the Fire Protection Regulatory Guide, the  
13 National Fire Protection Agency Standard 805, and Fire  
14 Protection Functional Inspection Program, Individual Plant  
15 Examinations of External Events -- the IPEEE Program, the  
16 Fire Risk Assessment Research Program, and the Quad Cities  
17 IPEEE fire results.

18 As we progress through today's briefing I ask in  
19 particular that each presenter focus on any significant  
20 issues that have developed or been identified since the  
21 March, 1998 Commission meeting. Now I understand that  
22 copies of the briefing materials are available at the  
23 entrances to the room, so unless my colleagues have opening  
24 or additional comments, Dr. Travers, please proceed.

25 MR. TRAVERS: Good morning, Chairman and

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1 Commissioners. Chairman, as you mentioned, we are here to  
2 brief you on the status of a number of high priority reactor  
3 fire protection activities and rather than list them again I  
4 will mention that at the table, joining me, is Dr. Brian  
5 Sheron, who is the Associate Director for Project Licensing  
6 and Technical Assessment in NRR; Tad Marsh, who is the Chief  
7 of Events Assessment, Generic Communications and Non-Power  
8 Reactors Branch in NRR; Ed Connell is a Senior Fire  
9 Protection Engineer in NRR; Alan Rubin, down here, who is a  
10 Section Chief in the Office of Nuclear Regulatory Research;  
11 Steve Reynolds, who is the Deputy Director of the Division  
12 of Reactor Safety in Region III; and also Steve West, who is  
13 a Section Chief in NRR.

14 We would like to begin with Dr. Sheron, who is  
15 going to provide you a brief summary of the subjects,  
16 Chairman, that you mentioned at the outset of this meeting.  
17 Following that, we intend to have the principal Staff  
18 representatives give you a short but more detailed  
19 presentation on each of those issues.

20 CHAIRMAN JACKSON: Thank you.

21 MR. SHERON: Good morning. Could I have the first  
22 slide, please.

23 As Bill said, I will walk through very quickly the  
24 major topics that we plan to present. I understand we have  
25 about 30 minutes of presentation time, so I was only going

1 to take about five minutes, hit the high points and then  
2 turn it over to the Staff and let them walk you through some  
3 of the details.

4 With regard to SECY 98-058, which you mentioned,  
5 Chairman, we are in the process right now of revising  
6 Appendix R and 50.48 to remove the requirement for  
7 non-combustible penetration seals. We are also implementing  
8 the removal of the Schedule 1 footnote to the guidance  
9 document which has been superseded, and we are right now on  
10 schedule to complete that in April of 2000.

11 The comprehensive Fire Protection Regulatory  
12 Guide, if you remember, we said that most of our guidance is  
13 kind of scattered in various documents and guidance, generic  
14 letters and information notices. Our intent was to try to  
15 pull that all together into one comprehensive document and  
16 to consolidate it. That is on schedule and we are planning  
17 on issuing a draft for public comment in September of this  
18 year.

19 For the National Fire Protection Association  
20 Standard 805, again that was supposed to provide a  
21 comprehensive, as you said a risk-informed,  
22 performance-based method for addressing fire protection  
23 requirements that would be an alternative to the current  
24 rules and regulations. We are participating on that  
25 committee in the development of that standard and right now



1 that is on schedule for completion in May of 2000.

2 On the Fire Protection Functional Inspection  
3 Program, as you know, that was to assess licensee  
4 implementation of the fire protection rules and regulations.  
5 We completed four pilot inspections. We are currently  
6 assessing the results. We have had workshops with the  
7 industry on this. We also have received a proposal from NEI  
8 with regard to future inspections in which they propose that  
9 basically the industry do self-assessments and the Staff  
10 basically oversee the self-assessment process.

11 We are in the process of evaluating that proposal  
12 as well, and our plan is to provide a Commission paper with  
13 our recommendations for how we proceed in the future in  
14 April of this year, so that's about two months.

15 CHAIRMAN JACKSON: Let me ask you, how does the  
16 National Fire Protection Standard 805 play off against the  
17 development of the Comprehensive Fire Protection Regulatory  
18 Guide and will that comprehensive guide have to be revised  
19 or will any type of regulatory guidance be necessary for  
20 that fire protection standard?

21 MR. SHERON: My initial reaction is that hopefully  
22 they will be complementary but the NFPA Guide is supposed to  
23 be risk-informed, whereas the Reg Guide is pulling together  
24 guidance for the existing rules and regulations, which again  
25 will be an alternative, so I am not sure that the Reg Guide

1 will be in any sort of a conflict with the NFPA Guide  
2 because the Reg Guide is basically for implementing the  
3 current Appendix R and 50.48 and the NFPA Standard would be  
4 an alternative.

5 Is that right, Ed?

6 MR. CONNELL: Right.

7 MR. SHERON: Okay.

8 CHAIRMAN JACKSON: Okay.

9 MR. SHERON: On the IPEEE Program, as you know,  
10 that's the external events assessment, the purpose is to  
11 examine potential severe accident vulnerabilities and to  
12 resolve some generic safety issues. I understand there are  
13 about 12 right now that are related to fire concerns.

14 The preliminary review of the submittals has been  
15 completed by our Office of Research, and we are using these  
16 results right now as insights to support the Fire Protection  
17 Functional Exams and our interaction and work on the NFPA  
18 805 Standard and also to feed into further fire research  
19 efforts.

20 We also have the ongoing Fire Risk Assessment  
21 Program in the Office of Research, and the purpose there is  
22 to improve our understanding of fire risk, to support our  
23 fire protection activities including our participation on  
24 the NFPA Standard as well as our inspections, and to improve  
25 analytical methods and tools, and the major results from

1 that program are expected in September of the year two,  
2 2000.

3 COMMISSIONER MERRIFIELD: Madam Chairman?

4 CHAIRMAN JACKSON: Please.

5 COMMISSIONER MERRIFIELD: I have a question  
6 regarding that last point. You expect that results from  
7 that assessment to be in September of 2000, but right now we  
8 are working with NFPA and we have already got a draft  
9 standard out, which will go final in May of 2000 and I am  
10 wondering are we out of synch?

11 Here we have a research program, the results of  
12 which you are not going to have until September of 2000, and  
13 yet we have action we are taking which will be effectuated  
14 in May of 2000.

15 MR. RUBIN: Let me comment on that. Although most  
16 of the results will be expected by 2000 or certainly the  
17 significant results, there will be interim products along  
18 the way. In fact, we have some results already from the  
19 Fire Risk Assessment Research Program that are being used by  
20 the agency in terms of the IPEEE reviews.

21 The NFPA Standard itself will have an appendix on  
22 risk assessment analyses and the insights from the IPEEE  
23 program and the Fire Research Program will be fed into that.  
24 That appendix has not yet been written but there are  
25 products that are being developed that will feed directly

1 into that activity.

2 CHAIRMAN JACKSON: Why don't you go ahead.

3 MR. SHERON: The last item is Quad Cities. As you  
4 know, on February '97 they submitted their IPEEE results,  
5 which showed a fire CDF of five times  $10^{-3}$ .  
6 The licensee took the initiative to shut the plant down due  
7 to deficient safe shutdown analysis. They did a revised  
8 analysis and concluded that the fire CDF was 6.6 times  $10^{-5}$   
9 the minus 5th. This analysis will be submitted in about two  
10 months in April.

11 Basically the reason that the number went down so  
12 much is they went more to looking at the plant-specific  
13 design. They made, as I understand it, a number of  
14 conservative assumptions in their risk assessment, for  
15 example that they would lose all of the 125 volt DC.

16 When they went back and they looked at the actual  
17 cable routing they realized they would not lose all of that  
18 and so when they took into account the details of the  
19 design, it is my understanding that you would not lose all  
20 of that, for example, the way they assumed, and therefore  
21 the risk went down.

22 CHAIRMAN JACKSON: So we haven't -- I mean the  
23 analysis hasn't come to NRC formally yet, is that correct?

24 MR. SHERON: That is my understanding.

25 CHAIRMAN JACKSON: And so we haven't accepted that

1 analysis as such -- what you are reporting is what they  
2 reported to you, is that correct?

3 MR. SHERON: Yes, that is correct.

4 CHAIRMAN JACKSON: And as far as you know, that  
5 there were no specific plant changes to have brought the  
6 core damage frequency down by two orders of magnitude? All  
7 pencil sharpening?

8 MR. REYNOLDS: Most of it has been. They did a  
9 few modifications that may have got them 10 percent, 15  
10 percent better, but the bulk of the risk reduction was  
11 understanding the plant better and doing some analysis  
12 better.

13 CHAIRMAN JACKSON: What does that say then about  
14 the other IPEEE submittals if, you know, if understanding  
15 their plant better gave a two order of magnitude change in  
16 the core damage risk from fires? I don't know who is  
17 responsible for reviewing those but --

18 MR. RUBIN: I will get into this a little bit in  
19 my presentation but the Staff's reviews of the IPEEEs are  
20 not intended to assess or evaluate all the assumptions that  
21 go into the licensee's assessment, IPEEE's. We just don't  
22 have the resources to do that.

23 Here is a case where the licensee made some very  
24 conservative assumptions, as Brian Sheron has said. That is  
25 one thing we would not necessarily review. The licensee has



1 chosen to do that. This is obviously a significant  
2 difference that can result if the input assumptions vary.

3 I don't know -- we haven't looked in detail at  
4 every other licensee, IPEEE, whether to see if that is the  
5 case or not, but we don't think it is.

6 This is, I think, a unique situation with Quad  
7 Cities, certain in terms of such a high core damage  
8 frequency. We hadn't seen that at any other plant.

9 CHAIRMAN JACKSON: Is this going to -- I mean the  
10 real issue has to do with the basis for Commission  
11 decision-making and all that will go into that basis. I  
12 mean it somewhat relates to Commissioner Merrifield's  
13 question of having Research Program results that -- I  
14 understand the point about modular products along the way --  
15 but in the absence of those, you know, you are talking about  
16 getting results but the Commission is supposed to make a  
17 decision on the National Fire Protection Association  
18 standard before then, and so the issue is what are we  
19 supposed to make of the IPEEE program results vis-a-vis fire  
20 vulnerabilities, be they on the positive or the negative  
21 side, relative to a comfort in stepping through a  
22 decision-making process.

23 MR. RUBIN: Well, the IPEEE reviews are focused on  
24 looking at each individual licensee's analysis, looking at  
25 plant vulnerabilities, see whether the licensee's done an

1 adequate job. In regards to the completeness of their  
2 reviews, have they overlooked significant parts of their  
3 analysis. It's --

4 CHAIRMAN JACKSON: That review didn't look at then  
5 something that could make a two-order-of-magnitude change in  
6 the core damage.

7 MR. RUBIN: Well, if we saw things missing -- in  
8 fact, for example, results of IPEEE and Quad Cities where  
9 turbine building fires were a significant risk contributor,  
10 we took that into account in looking at reviews of other  
11 licensee submittals, and if there was not sufficient  
12 information in the turbine building, we've asked questions  
13 and --

14 CHAIRMAN JACKSON: So as long as it's overly  
15 conservative, we don't look anymore. Is that the point?

16 MR. RUBIN: I'd say --

17 CHAIRMAN JACKSON: But how do you know it's overly  
18 conservative if you don't look?

19 MR. RUBIN: Unless we do, you know, followup  
20 audits or onsite inspections, we probably would not.

21 CHAIRMAN JACKSON: Okay.

22 MR. SHERON: I'll turn it over now to Ed Connell.

23 MR. CONNELL: Good morning. Thanks, Brian.

24 I'm just going to briefly touch on things that NRR  
25 was assigned out of 98-058, and that was the revision of

1 Appendix R, deleting the noncombustible requirement from  
2 section III.M, developing the comprehensive reg guide and  
3 working with NFPA and industry to develop NFPA 805. And I  
4 just want to point out that industry supports the current  
5 path concerning the reg guide and the NFPA 805 process. And  
6 then we provided an update to the Commission this past  
7 October on the status of the NFPA activities and the  
8 resolution of the issues, the 12 issues that were in 97-127.

9 CHAIRMAN JACKSON: Let me take you up on  
10 something.

11 MR. CONNELL: Sure.

12 CHAIRMAN JACKSON: This has to do with the  
13 SECY-98-058. You know, if I look ahead to Mr. Lochbaum's  
14 presentation, I note that he disputes the staff's conclusion  
15 that there is no technical basis for the noncombustibility  
16 requirement. Can you elaborate on this issue?

17 MR. CONNELL: I think so. The purpose of a  
18 penetration seal was to prevent fire propagation from one  
19 side of the barrier to the other side of the barrier. What  
20 that material -- how that material does that we've left  
21 flexibility to the designers and the plants to choose  
22 whatever material best suits their purpose.

23 The fact that a material is combustible as silicon  
24 foam is does not prevent it from performing its function.  
25 The doors to this room are made of wood. Wood's a

1 combustible material. They are also rated fire doors. So  
2 you can have a combustible material that serves its function  
3 as a fire-barrier material. What it does is it delays  
4 propagation of the fire from one side of the barrier to the  
5 other. In fact, wood is actually more combustible than the  
6 silicon foam that's used in the penetration seal in the  
7 plant.

8 CHAIRMAN JACKSON: So in laying out or in  
9 proposing to delete the requirement for noncombustible  
10 penetration seals, you then are going to replace it with  
11 what the performance requirements have to be?

12 MR. CONNELL: Yes.

13 CHAIRMAN JACKSON: For such seals?

14 MR. CONNELL: Yes. We've established those in  
15 previous -- in the rule, the requirements are there, and  
16 also in previous generic communications we've established  
17 those requirements.

18 CHAIRMAN JACKSON: And when you've done the fire  
19 protection functional inspections, you've verified that the  
20 penetration seals satisfy --

21 MR. CONNELL: Part of -- of course, they don't --

22 CHAIRMAN JACKSON: Or you --

23 MR. CONNELL: There are thousands of penetration  
24 seals.

25 CHAIRMAN JACKSON: Of course.

1 MR. CONNELL: They look at, you know, a sample and  
2 they look at the licensee's program to how they design,  
3 install, and maintain the penetration seals that are in  
4 their plant.

5 CHAIRMAN JACKSON: How do you get to the  
6 performance issue of combustible seals in terms of whether  
7 they can perform their intended functions vis-a-vis the  
8 requirements?

9 MR. CONNELL: Right. Well, a qualification test  
10 is performed to qualify the seals as a 1, 2, or 3-hour-rated  
11 barrier. There's a standardized test that's performed --

12 CHAIRMAN JACKSON: By the vendor.

13 MR. CONNELL: No. No, by an independent testing  
14 laboratory such as Underwriters Laboratories or Factory  
15 Mutual, some other independent testing laboratory. And  
16 you'll -- Underwriters Laboratories, for example, publishes  
17 a directory of rated assemblies annually published -- a  
18 directory of rated assemblies that can be used, basic  
19 designs that could be used by licensees to use it. And it's  
20 used not just in nuclear plants, it's used throughout the  
21 construction industry.

22 CHAIRMAN JACKSON: And the licensees have good  
23 documentary records that such tests have been performed and  
24 you've verified that the seals they have in the plants in  
25 fact conform?



1 MR. CONNELL: Well, that's one of the things that  
2 we look at. Of course I wouldn't say that all -- well, I  
3 couldn't make the statement that all plants have great  
4 documentation. The documentation varies. But you do look  
5 at that, and if there are gaps, we ask the licensees to  
6 address those.

7 CHAIRMAN JACKSON: Okay.

8 MR. CONNELL: Okay?

9 Next slide, please, Tanya.

10 And regarding the penetration seal issue, I just  
11 wanted to note that the ACRS has also addressed this issue,  
12 and they concur with the staff's position and the Commission  
13 direction regarding the noncombustible requirement.

14 And then last October we sent the Commission a  
15 memo updating the status of the rulemaking. We guesstimate  
16 about one-and-a-half pages will come out of 50.48  
17 altogether, deleting the schedule or stuff, and the material  
18 related to the obsolete guidance documents. You get a  
19 little reduction.

20 I'll move on to the next one now, talk a little  
21 bit about the comprehensive reg guide.

22 As you're aware, the guidance is contained in  
23 numerous documents spanning a period of about 25 years.  
24 We'd like to clean that up a little bit. There's some  
25 conflicts in the guidance, as would be expected over such a

1 long period of time. We'd like to replace that with the  
2 comprehensive guide, have it all in one place. I think  
3 right now the guidance takes about five volumes on my desk,  
4 so we'd like to if we can shrink that down a little bit.

5 The guidance will allow, although not prescribe,  
6 performance-based methods as they are developed, consistent  
7 with the research program and some efforts from NFPA 805.  
8 The reg guide is, the way we view it, is to be applicable to  
9 plants that elect to maintain their existing fire protection  
10 license condition, such as Appendix R. It is a parallel  
11 effort with the 805 effort. It will include some additional  
12 areas for guidance that we have not addressed in the past  
13 such as compensatory measures. We think we could do a  
14 little better job on the guidance there is out there on  
15 compensatory measures.

16 CHAIRMAN JACKSON: Speaking of that, you know,  
17 what does the guidance entail regarding the use, extent, and  
18 duration of fire watches?

19 MR. CONNELL: We don't have guidance that  
20 expressly addresses that. That's why we think the reg guide  
21 is necessary -- one of the reasons why we think the reg  
22 guide is going to sort of fill that hole.

23 CHAIRMAN JACKSON: So you're going to explicitly  
24 address that?

25 MR. CONNELL: Yes.

1 CHAIRMAN JACKSON: In the new reg guide.

2 MR. CONNELL: Um-hum. Um-hum.

3 And just to note we have a meeting later on this  
4 month to address the feedback for the draft outline that we  
5 issued December of last year.

6 COMMISSIONER DICUS: Madam Chairman?

7 CHAIRMAN JACKSON: Let me ask one more question.

8 You mentioned the circuit analysis, you know, you  
9 said this is an area where additional or revised guidance is  
10 needed. Now what's the staff's position relative to the  
11 need to protect circuits versus performing detailed circuit  
12 analysis to resolve issues?

13 MR. CONNELL: Well, I don't think it's going to  
14 one or the other. I think what's going to come out is going  
15 to be a combination. Some circuits are going to require  
16 protection. Some circuits maybe we can address analytically  
17 so they do not require protection. But I don't think it's  
18 going to be an either/or --

19 CHAIRMAN JACKSON: Well, have you worked out the  
20 kind of an approach or criteria for when you go down one  
21 path or --

22 MR. CONNELL: Well, that's still under  
23 development. I think you're aware that NEI and the BWR  
24 Owners Group are working on a circuit analysis resolution  
25 plan. NEI has an issue task force working on that. And

1 we're involved with their efforts.

2 CHAIRMAN JACKSON: What does our involvement  
3 entail?

4 MR. CONNELL: Well, we have meetings. They have  
5 some proposed positions that we've looked at, we've provided  
6 some feedback on, and we're continuing that discussion.

7 CHAIRMAN JACKSON: But the NRC staff does not have  
8 any position on the issues. We're reviewing their  
9 positions. Is that what you're saying?

10 MR. CONNELL: We are not developing right now an  
11 independent path for the resolution of this at this time.

12 CHAIRMAN JACKSON: No, I don't mean that. I mean  
13 we haven't laid out any, you know, specific basic  
14 requirements that whatever is developed must satisfy --

15 MR. WEST: I'll try to address your question.  
16 Steven West.

17 The staff does have existing positions on  
18 protection of circuits and circuit analysis, and the  
19 positions at the highest level are built into the regulation  
20 and Appendix R, and we've issued a number of guidance  
21 documents over the year to try to clarify or interpret those  
22 requirements. Generic Letter 86-10 is one that's frequently  
23 mentioned. But based on interactions with industry and  
24 issues that have come up during inspections and that have  
25 been reported through LERs have convinced us that we need to

1 relook at that guidance, principally because there appears  
2 to have been in some cases differing interpretations still  
3 of what it meant and how it was implemented.

4 And we've had findings that licensees have  
5 disputed based on interpretation of regulation or guidance,  
6 and the effort that we're undertaking now is to come up with  
7 a clarification of guidance or maybe the final word on  
8 guidance, what the circuit analysis should be. And the  
9 staff originally was undertaking that effort internally, and  
10 the BWR Owners Group and NEI expressed an interest in  
11 cooperating with us to give us their insights and feedback,  
12 and we've agreed to do that. But we are working directly  
13 with them. It's expected that sometime this year the owners  
14 group will submit a topical report for staff review that  
15 would contain -- would specify a method for doing circuit  
16 analysis and identifying the circuits that should be  
17 protected and those that maybe could be addressed  
18 analytically.

19 In parallel, NEI is working on a method that would  
20 take the next step and apply risk information to the  
21 analysis. So there would be -- first you would go through  
22 the deterministic analysis identified by the owners group  
23 method, and then you may apply the NEI method to get a finer  
24 cut. But as Ed said, we still expect -- and I'm sure  
25 industry does also -- that there still will be circuits,



1 cables that will require protection. It's not a question of  
2 analyzing away all circuits. That's --

3 CHAIRMAN JACKSON: Well, that's not the nature of  
4 the question. The real question is how much of a position  
5 or thought in terms of what is fundamental from the  
6 regulatory point of view vis-a-vis safety in terms of how  
7 much you go down one path or, you know, how you go about  
8 making an analysis in a given situation of how much you go  
9 down one path or another.

10 And I guess I just want to have some sense that  
11 the NRC staff has thought about this and has, you know, I  
12 think -- I mean, I applaud in fact the efforts that you're  
13 making with the owners groups and with NEI, but it is very  
14 important that as part of that that, you know, we have some  
15 clarity ourselves as to, you know, what, you know, the  
16 safety regulator, what we feel is important.

17 MR. WEST: Yes, ma'am, we agree, and in fact we do  
18 have a firm position in the regulatory record, and we are  
19 today inspecting to the requirements and the criteria that  
20 are in place. And we haven't stopped inspecting or  
21 overseeing --

22 CHAIRMAN JACKSON: No, no, no. You miss my point.  
23 See, for instance, we are migrating the oversight paradigm,  
24 right?

25 MR. WEST: Right.

1 CHAIRMAN JACKSON: And there are some fundamentals  
2 that were part of that, i.e., cornerstones of safety.

3 MR. WEST: Yes, ma'am.

4 CHAIRMAN JACKSON: You can then -- that does not  
5 stop you from working with others, refining them, fleshing  
6 them out, revising your regulatory framework. But you have  
7 to be clear on what you think is important from the point of  
8 view of protecting public health and safety, going in.

9 MR. WEST: Yes, ma'am, I agree, and I'm not  
10 communicating well. I apologize. But we have  
11 established --

12 CHAIRMAN JACKSON: Maybe I'm not communicating.

13 MR. WEST: No, you are, but we have established  
14 through our work with the owners group and NEI what our  
15 requirements are and what our expectations are.

16 CHAIRMAN JACKSON: Okay.

17 MR. WEST: So it's clear, we're all working from a  
18 common baseline, I believe.

19 CHAIRMAN JACKSON: Commissioner Dicus.

20 COMMISSIONER DICUS: Yes. When you do the revised  
21 guidance, I'm assuming it does take out the conflicts that  
22 we currently have in our guidance.

23 MR. CONNELL: Yes.

24 COMMISSIONER DICUS: I want to be clear.

25 MR. CONNELL: Yes.

1 COMMISSIONER DICUS: Now in the process of doing  
2 this, have you identified any policy issues?

3 MR. CONNELL: Not so far. Most of the conflicts  
4 are detailed technical requirements, how long hose needs to  
5 be, how far you have between fire hydrants, what kind of  
6 separation you have as far as vertical separation between  
7 cable trays, things like that.

8 COMMISSIONER DICUS: Thank you.

9 CHAIRMAN JACKSON: Okay. Go on.

10 MR. CONNELL: Okay. I'd like to cover 805 now.  
11 The next slide, please, Tanya.

12 Followed by performance objectives which are more  
13 specific, can be -- some are more qualitative, some are more  
14 quantitative, depending upon the specific objectives. Then  
15 that follows to the performance criteria, which are  
16 quantitative and are expressed in engineering terms and are  
17 measurable.

18 The use of the terms in the standard right now is  
19 consistent with the way the staff's draft positions or draft  
20 definitions were in SECY-98-144. They are consistent with  
21 the National Fire Protection Association's Report on  
22 Performance-Based Codes and Standards which was issued in  
23 1995, and the Society of Fire Protection Engineers Draft  
24 Engineering Guide, which was issued last year.

25 I just wanted to note that we had a meeting with

1 the ACRS Fire Protection Subcommittee a few weeks ago and  
2 one with the full Committee last week and we have extensive  
3 feedback from the ACRS on the 805 process.

4 The next slide, please. Here is kind of a graphic  
5 overview of the fire protection pyramid. Here, where you  
6 have a baseline fire protection program under 805,  
7 basically, you use minimal deterministic requirements that  
8 we believe are essential for all plants, things like a water  
9 supply, a fire brigade, administrative controls, procedures  
10 that we do not believe lend themselves to performance-based,  
11 risk-informed methods, just good industrial fire protection  
12 requirements. That makes up the baseline part of the  
13 program.

14 That follows up to the additional requirements,  
15 performance requirements, and here, the way the standard is  
16 structured is licensees are given the option of pursuing a  
17 deterministic similar to the existing Appendix R approach,  
18 or they are given the flexibility of adopting a  
19 performance-based approach that could be based upon risk  
20 information, it could be based on engineering evaluations,  
21 fire modelings, or any other analytical tool that  
22 demonstrated they still meet the performance criteria.

23 This is topped off with a site-wide risk  
24 evaluation, similar, but we believe an enhancement to the  
25 existing IPEEE to provide some additional information and a

1 larger overview of the fire protection program to look at  
2 the risk insights that might be gained, and if there are any  
3 additional improvements that need to be made to the fire  
4 protection program as a result of that risk information.

5 CHAIRMAN JACKSON: Now, are you saying this is  
6 where NRC is going, or you are proposing to go?

7 MR. CONNELL: This is the way the standard is  
8 structured, the draft standard is structured today.

9 CHAIRMAN JACKSON: Okay.

10 MR. CONNELL: Each one of these will be part of  
11 the overall fire protection program if a licensee elects to  
12 adopt 805.

13 CHAIRMAN JACKSON: Okay. Now, there was a recent  
14 Commission paper on fire protection functional inspection,  
15 and the staff indicated, and I quote, "that the tools to  
16 measure the risk significance of specific fire protection  
17 inspection findings are not mature." Now, as such, then,  
18 how would you say that they are suitable to do this pyramid,  
19 but, in particular, the site-wide risk examination?

20 MR. CONNELL: Well, consistent with that, I think  
21 a lot of the things in the baseline fire protection program,  
22 we believe that the risk tools are not mature to assess  
23 those. That is why we are prescribing them.

24 CHAIRMAN JACKSON: So that is why you are going to  
25 review those? These are the very prescriptive.



1 MR. CONNELL: That's right. But this is a minimal  
2 level. This is -- and most of the plants have this already.  
3 I mean this is not going to be a change. They already have  
4 a fire brigade, they already have a water supply. They have  
5 manual suppression capability. They have administrative  
6 controls, they have procedures. So this is not going to be  
7 change from they currently have.

8 CHAIRMAN JACKSON: But I am talking about the top  
9 of the pyramid.

10 MR. CONNELL: The top of the pyramid is the risk  
11 tools can't address everything, okay, but they do provide  
12 additional insights, and that is what the site-wide risk  
13 evaluation is for, is to provide additional insights in case  
14 something may have been missed by the baseline program or  
15 the additional performance requirements, whether they be  
16 deterministic or performance-based. That's where we get the  
17 risk information into the overall fire protection program,  
18 which we currently only have limited with the IPEEE, because  
19 we will address things beyond core damage frequency. We  
20 will address LERF, we will address shutdown risk.

21 CHAIRMAN JACKSON: Okay.

22 MR. CONNELL: My next slide, please. Just a  
23 status of where we are and where we are going to be. We did  
24 issue the -- or made available to the public the draft  
25 standard this past November. We had a meeting three weeks

1 ago to discuss some of the internal Committee comments and  
2 some public comments that have been received.

3 The public proposal period for the draft that was  
4 issued in November closes next week. We are going to have a  
5 meeting on those public proposals next month. The standard  
6 will be issued for public comment at the end of July this  
7 year, and the public comments will be due for that October,  
8 and then the final draft will be published in March and will  
9 be voted on by the NFP membership in May of 2000.

10 CHAIRMAN JACKSON: Does this schedule stay within  
11 the Commission's expectations or has it --

12 MR. CONNELL: This is what we reported in 98-058  
13 and in 92-47.

14 COMMISSIONER McGAFFIGAN: Madame Chairman.

15 MR. CONNELL: That concludes my material.

16 CHAIRMAN JACKSON: Thank you.

17 COMMISSIONER McGAFFIGAN: On 805, NEI is later  
18 going to testify that they have a concern with regard to the  
19 staff's intention that 805 be all or nothing. Can you  
20 respond to that concern?

21 MR. CONNELL: I can tell you what our plan was  
22 regarding it. We believe that in order to simplify our  
23 approach and our oversight of the reactor fire protection  
24 program, it would be preferred if licensees either maintain  
25 their existing license condition or adopt a risk-informed,

1 performance-based alternative in its entirety. Okay.

2           However, there is nothing that prevents, if they  
3 elect to maintain their existing license condition, there is  
4 nothing that prevents them from using the analytical tools  
5 that will be available in 805 as a basis for future  
6 exemptions or future deviations. There is nothing that  
7 prohibits that. We would prefer them to adopt 805 in its  
8 entirety. That would eliminate the need for the exemptions  
9 and the deviations, but 10 CFR 50.12 is still going to be  
10 available for them as an alternative.

11           COMMISSIONER McGAFFIGAN: Madame Chairman, can I  
12 follow up?

13           CHAIRMAN JACKSON: Please.

14           COMMISSIONER McGAFFIGAN: At the moment we have  
15 Appendix R, we have pre-Appendix R. My assumption is that  
16 this new rule endorsing this new standard, which has both  
17 prescriptive, deterministic and performance-based options in  
18 it will have to be -- it will have to be voluntary because  
19 of backfit rule. So you are going to have a new system  
20 which itself has multiple options in it, right?

21           MR. CONNELL: Yes.

22           COMMISSIONER McGAFFIGAN: So, will you -- I mean I  
23 count four at a minimum. You have got pre-Appendix R, if  
24 they stay with pre-Appendix R, Appendix R, and then Option A  
25 and Option B under the new standard. You are going to

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1 simultaneously have four plus --

2 MR. CONNELL: There will be three.

3 COMMISSIONER McGAFFIGAN: Okay.

4 MR. CONNELL: If they adopt 805, that will be  
5 their license condition. Okay. Within 805, there are  
6 deterministic and performance, but it is still the same  
7 license conditions.

8 COMMISSIONER McGAFFIGAN: Okay.

9 MR. CONNELL: So they will have sufficient  
10 flexibility, I believe,, that it would be desirable.

11 COMMISSIONER McGAFFIGAN: Okay.

12 MR. CONNELL: The additional burden is going to be  
13 on the site-wide risk evaluation. We see that as an  
14 expansion of the existing IPEEE. So if they want to elect  
15 to adopt that burden, they will get better risk information.

16 COMMISSIONER McGAFFIGAN: Okay.

17 CHAIRMAN JACKSON: Okay. Commissioner.

18 COMMISSIONER DICUS: Do you plan to have any pilot  
19 plants or have any plants come forward and want to be a  
20 pilot plant?

21 MR. CONNELL: I think, if you notice, NEI, I think  
22 is going to cover it in their presentation, but some plants  
23 have expressed an interest in piloting the 805 standard,  
24 yes.

25 CHAIRMAN JACKSON: Why don't you go on?

1 MR. CONNELL: I'm finished. I will turn it over  
2 to Steve now to talk about the FPGI.

3 CHAIRMAN JACKSON: Okay.

4 MR. WEST: Good morning, I am Steve West, the  
5 Chief of the Fire Protection Engineering Section. I am  
6 going to give you a briefing on the fire protection  
7 functional inspection program, and I will try to be brief.  
8 But, basically, the program came out of two staff  
9 activities. One was thermo-lag and a commitment we made to  
10 inspect the thermo-log corrective actions at all plants, and  
11 I think about 80 plants use thermo-lag, so it was a  
12 significant inspection activity.

13 And the other was a fire protection program  
14 reassessment that came out of the thermo-lag issue itself,  
15 and in that reassessment, there were recommendations that we  
16 relook at the scope and depth of inspections we were doing  
17 and maybe make changes to try to preclude problems  
18 thermo-lag coming up in the future.

19 So, basically, the objectives were to --

20 CHAIRMAN JACKSON: Can you give the timeline for  
21 this program?

22 MR. WEST: Yes, ma'am. We originally identified  
23 the need to do the inspections of thermo-lag corrective  
24 actions in the thermo-lag action plan which we -- the first  
25 revision, or original version we issued in August of 1992 to

1 the Commission. The fire protection program reassessment  
2 was completed in February of 1993, and that was actually a  
3 thermo-lag action plan task.

4 Later, in SECY-93-143, May '93 timeframe, we  
5 reported to the Commission our plans to address the  
6 recommendations from the reassessment, and in there we  
7 identified the need to look at the fire protection --  
8 reactor fire protection inspection program.

9 It was finally in December of 1996 in SECY-96-267  
10 that we presented to the Commission our final plan for the  
11 FPGI program, identifying the scope and objectives of the  
12 program. And in a SRM of February 1997, the Commission  
13 indicated that they had no objection to the staff going  
14 forward with the FPGI pilot program.

15 Since February of 1997, we have issued at least  
16 one interim status report late last year, and there was  
17 another one which you may or may not have, it was on its way  
18 to you last time I checked. It may be there.

19 MS. VIETTI-COOK: They have it.

20 MR. WEST: They have it.

21 MS. VIETTI-COOK: They got it yesterday.

22 MR. WEST: Okay. Great. So that is kind of the  
23 chronology of where we are. But, basically, four  
24 objectives, as I said, to inspect thermo-lag corrective  
25 actions. We were also trying to determine if the licensees

1 were maintaining the licensing and design bases and  
2 complying with the fire protection requirements and their  
3 commitments to meet those requirements or fire protection  
4 guidance.

5 We also wanted to continue in the vein of the  
6 reassessment to assess the NRC reactor fire protection  
7 program to determine if it had appropriately addressed all  
8 fire safety issues and, kind of along those lines, to assess  
9 the strengths and weaknesses of our program, our regulatory  
10 process for fire protection.

11 Another objective was, again, as I said, to  
12 reevaluate the scope and depth of the NRC reactor inspection  
13 program and to develop a coordinated approach to reactor  
14 fire protection and post-fire safe shutdown inspections, and  
15 by doing so, to determine the appropriate level of future  
16 fire protection inspections.

17 And another objective which we explicitly  
18 identified in our paper was to attempt to renew industry  
19 attention to fire safety. There was a feeling in the  
20 thermo-log era that the interest in -- or attention to fire  
21 safety had dropped off within industry, and I think, to some  
22 extent, within the NRC staff also.

23 CHAIRMAN JACKSON: Steve, how do you foresee fire  
24 protection inspections in the new NRC reactor oversight  
25 program? I mean is there a need for a level of baseline

1 inspection?

2 MR. WEST: That's a good question and it is one  
3 that actually we are trying to come up with an answer to  
4 right now. That is one of the reasons we have delayed our  
5 final report. As you know, when we started this process,  
6 there was no concept that there would be a new performance  
7 assessment inspection program, and it is come along right at  
8 about the -- you know, they have kind of hit head-on with  
9 the end of the FPMI pilots. And we are trying to assess the  
10 lessons learned from the FPMI pilot inspections, and a  
11 couple of other FPMI-like inspections that we have done, and  
12 make a decision on whether or not we should just develop a  
13 program that fits nicely into the new process, or whether  
14 fire protection for at least some period of time needs to be  
15 treated as a special case.

16 And I think actually if you ask the inspectors  
17 that did the inspections, they have ideas. I developed a  
18 program, I have ideas. I know my management has ideas in  
19 the EDO. So we are really -- I was going to mention later,  
20 there is a significant challenge to us right now to try to  
21 come up with a recommendation for you that addresses that  
22 very question.

23 CHAIRMAN JACKSON: Okay. Well, I think it  
24 requires some specific thought and effort. I mean I  
25 encourage you very strongly.



1 MR. WEST: Yes, ma'am.

2 CHAIRMAN JACKSON: Because it is an opportunity  
3 and coming -- you know, you have the insights coming out of  
4 your FPFi.

5 MR. WEST: Yes, ma'am.

6 CHAIRMAN JACKSON: So I think it is very important  
7 to give some specific thought to it, difficult though it may  
8 be.

9 MR. WEST: Yes, ma'am. And I will talk a little  
10 bit about what we are doing now, and kind of they all feed  
11 into that, trying to answer that question.

12 I am on slide number 11. So, anyway, so we can  
13 get through this quickly, I will cover what the scope of the  
14 program was and what our accomplishments were together,  
15 because, basically, we have completed the program,  
16 essentially, as we laid it out originally in 1996. We did  
17 develop new inspection procedures for FPFIs, and it was a  
18 comprehensive fire protection and safe shutdown procedure.

19 And I should make it clear that when we talk about  
20 fire protection functional inspections, we are normally  
21 talking about what you would normally think of as a fire  
22 protection feature that may be installed in a plant, like a  
23 sprinkler system, or the fire extinguishers, or the fire  
24 hoses or the fire brigade.

25 We are also talking about the capability of the

1 plant being able to achieve and maintain post-fire safe  
2 shutdown. So if they have a fire, they are going to have  
3 the systems available to achieve shutdown. So it is also  
4 classical fire protection, and it is also the safe shutdown  
5 capability itself, the plant systems and other features that  
6 are used by the reactors to shut the plant down. So it is a  
7 very complicated, complex area.

8 And the scope and depth of this new inspection  
9 procedure went -- I will just characterize it way beyond any  
10 previous NRC inspection procedure for fire protection. And  
11 another thing that we factored into the program right from  
12 the beginning was the use of risk insights to help focus on  
13 areas of inspection.

14 That worked very well. We did conduct four pilot  
15 inspections. As we specified in the SECY paper, we went to  
16 River Bend, Susquehanna and St. Lucie and did full FPFIs.  
17 The fourth one we deviated a bit from what we told you we  
18 would do in the Commission paper and we went to Prairie  
19 Island, but instead of doing a full-scope FPMI, we did what  
20 we are calling a reduced-scope FPMI where we basically  
21 inspected a licensee's self-assessment that was based on the  
22 FPMI procedure and also Prairie Island, when they did their  
23 self-assessment, took into consideration the lessons learned  
24 from the previous FPFIs and another difference with that  
25 inspection is the first three were led by Headquarters with

1 regional support. The Prairie Island was led by the region  
2 with Headquarters support, so it was a little bit different  
3 focus there and we're trying to get information on how well  
4 a licensee's self-assessment program may fit into the future  
5 of fire protection inspections.

6 CHAIRMAN JACKSON: Well, see, that's also -- that  
7 takes me back to the question I had raised with you  
8 vis-a-vis the new Reactor Oversight Program, because, you  
9 know, the role of baseline inspections by self-assessments,  
10 by special inspections being addressed -- I'm listening.

11 MR. WEST: You just reminded me I never really did  
12 answer your question. You did ask did we think that  
13 baseline --

14 CHAIRMAN JACKSON: Yes, I did. That's right.  
15 I thought you were just being smooth and avoiding  
16 my question.

17 [Laughter.]

18 MR. WEST: I think whatever we do there will be  
19 some NRC baseline inspection involved and that is currently  
20 built into the process. What exactly that inspection would  
21 look like is up in the air, but I will talk to you a little  
22 bit about the current baseline or core inspection on the  
23 next slide.

24 CHAIRMAN JACKSON: Okay.

25 MR. WEST: In addition to the four pilot FPFIs

1 that we did, we also did a couple of other inspections. We  
2 did inspections at Quad Cities and Clinton, and they were  
3 not FPFIs but we used FPGI techniques during those  
4 inspections so we are also considering the lessons learned  
5 from those two inspections in our process now to assess  
6 where to go in the future.

7 Finally, we had a one-day workshop with industry  
8 and the other stakeholders and we did this in November of  
9 1998. It was a very worthwhile exercise. We got a lot of  
10 good information out of the workshop from licensees and from  
11 industry and from others. We basically discussed the  
12 results of the program, got input from the stakeholders.

13 We learned in the workshop that one of our  
14 objectives, to increase industry awareness of fire  
15 protection, to refocus industry, we accomplished. For  
16 example, a lot of licensees that were not subject to the  
17 pilot program had gone out and done self-assessments on  
18 their own initiative. I think NEI -- I don't know if they  
19 were going to do FPFIs in their presentation, but they  
20 acknowledged in the workshop and in a later meeting with the  
21 Staff that we had been very effective in doing that.

22 The inspection procedures were I think by  
23 everybody that talked about them thought they were  
24 outstanding inspection procedures and in fact we will talk  
25 in a second about NEI's proposal, but they believe those

1 procedures could be used in an industry initiative later.

2 One interesting thing that came up -- well,  
3 actually we raised it and industry agreed, licensees agreed,  
4 was the use of risk -- risk assessment in fire protection  
5 and the need to come up with tools and methods to assess  
6 fire protection deficiencies like those that you find during  
7 an inspection.

8 Again, that is something that we are working on  
9 now. We have had some internal meetings with our fire  
10 protection staff and our risk staff from NRR and Research.  
11 We have a meeting in a couple of weeks with the same people  
12 plus we are bringing in all the SRAs from the regions and  
13 others within the agency that are interested and are  
14 responsible for risk assessment.

15 The real problem is not that it can't be done. We  
16 have had some experience in looking at some of the FPFPI  
17 procedures where we have different groups looking at the  
18 same issue, and they come up with different answers. To get  
19 the answers we are spending a lot of time and effort and  
20 resources. We want to come up with a way to assess fire  
21 protection deficiencies, kind of a standardized approach  
22 where everybody is looking at it in the same way and you can  
23 expect fairly consistent results by somebody that is  
24 knowledgeable and experienced and trained in using the  
25 method, and it has got to be a method that can be done

1 easily.

2           You can't spend two weeks looking at each fire  
3 protection deficiency that we find, and industry, NEI in  
4 particular, also recognizes the shortcomings and the need to  
5 overcome those, and there are some industry efforts underway  
6 to develop techniques, and I expect that -- we are going to  
7 be having a meeting with NEI shortly, but I expect that  
8 sometime we'll come together again with industry and try to  
9 continue to cooperate in this area.

10           Okay, next slide please -- Slide 12.

11           Some of our preliminary observations -- we have  
12 discussed, I think we have discussed these in the interim  
13 reports that we have forwarded to the Commission, but some  
14 licensees expended more resources to prepare for FPFIs than  
15 we had expected when we set up the program.

16           CHAIRMAN JACKSON: So that was a surprise?

17           MR. WEST: Yes, that was a surprise.

18           CHAIRMAN JACKSON: And I mean why are licensees  
19 not already ready? I mean I guess that is what is  
20 confusing.

21           MR. WEST: That is another good question.

22           Some licensees -- I don't want to give the  
23 impression that no licensees are ready --

24           CHAIRMAN JACKSON: No, I am talking about any  
25 specific cases.

1 MR. WEST: Well, one specific example I can give  
2 you where we have some letters from the licensee. It was  
3 St. Lucie -- and they asked us to postpone the FPGI that we  
4 had scheduled there and in their letter they stated that it  
5 was going to take them basically 24,000 staff hours to  
6 prepare for the inspection, and when you see a number like  
7 that, that is a huge surprise.

8 It turns out in their case we believe that they  
9 weren't preparing for the inspection -- just in other words  
10 getting the documents ready --

11 CHAIRMAN JACKSON: They were getting the plant --

12 MR. WEST: -- for the Staff. They were fixing  
13 their program, and it turns out they had some significant  
14 problems with their fire protection program itself.

15 MR. MARSH: Let me add a comment, if I can. To be  
16 fair, this is a new inspection procedure, a new inspection  
17 process, and there was in my opinion growing in terms of the  
18 industry looking at what they needed to do to prepare for  
19 it, so there was certainly some getting the plant, getting  
20 the procedures ready but it was also where is the agency  
21 looking, what does this procedure look like.

22 There was growth on both sides in this endeavor, I  
23 would say.

24 COMMISSIONER MERRIFIELD: Chairman, I just -- you  
25 know, I seized upon the same sense you did, and I am

1 reminded of the discussions we went through when we had our  
2 reanalysis of the OSPRI program --

3 CHAIRMAN JACKSON: OSPRI --

4 COMMISSIONER MERRIFIELD: -- where we had spent  
5 significant resources to get ready and I think that is a  
6 concern. That is a concern, particularly since from a  
7 risk-based analysis fire issues are one of the most  
8 significant things we have to deal with.

9 If people have to expend resources at these plants  
10 to get ready to do this, and I understand that it is a new  
11 program, a new way of doing things --

12 CHAIRMAN JACKSON: With all the people working  
13 every hour for a year, that is a lot.

14 COMMISSIONER MERRIFIELD: And what does that  
15 indicate to us for the other plants that were not doing this  
16 kind of an assessment?

17 CHAIRMAN JACKSON: That's right.

18 MR. WEST: Again, that is a part of --

19 CHAIRMAN JACKSON: Speak to the microphone.

20 MR. WEST: That is part of something we are taking  
21 a look at. We touched on the --

22 COMMISSIONER MERRIFIELD: Well, does it concern  
23 you?

24 [Laughter.]

25 MR. WEST: Yes, it does. Very much. Very much.



1 COMMISSIONER MERRIFIELD: Okay.

2 MR. WEST: And I think comments during the  
3 workshop we received from industry for example, they were  
4 also quite surprised about this and acknowledged that it was  
5 a matter of having a program that needed to be repaired in  
6 advance of an inspection, or that was the attempt.

7 MR. MARSH: During the workshop there was  
8 acknowledgement on the part of the industry that there was a  
9 great deal of effort they had to go through to get ready for  
10 these inspections, and in the sense that there was some  
11 housecleaning that needed to be done on their part to  
12 gain -- regain assurance of fire protection programs.

13 We didn't hear in the workshop the fire protection  
14 functional inspections were on the wrong track. They were  
15 not finding things that were not important, that the  
16 programs were all ready to go. We didn't hear that. We  
17 heard an acknowledgement that there was a need for this  
18 program and an acknowledgement that fire protection programs  
19 needed to improve, and that through many endeavors through  
20 either their self-assessment process or through an  
21 inspection process they believed that improvements have been  
22 made, and that was one of the objectives of this program was  
23 to regain the sensitivity to fire programs.

24 CHAIRMAN JACKSON: Well, again, I mean I sound  
25 like -- I will call myself "the broken CD" -- you know,

1 "record" -- the "broken CD" from now on. I hope you all  
2 took notes relative to the new Reactor Oversight Program  
3 because you have got to kind of grapple with what at a  
4 fundamental level we need to be looking at and what at a  
5 fundamental level licensees need to be doing and looking at,  
6 because this kind of thing is an eye-catcher.

7 MR. WEST: Yes, ma'am -- we have been --

8 CHAIRMAN JACKSON: And when you tell us the  
9 numbers, you know, 24,000 hours, that is a lot --

10 MR. WEST: Right.

11 CHAIRMAN JACKSON: -- and, you know, there can be  
12 a knee-jerk reaction, "Oh, there's the onerous NRC" but if  
13 people, if it is a risk-informed look, and folks are not  
14 telling you you are barking up the wrong tree, then that  
15 says something, that that is an area that we have to ensure  
16 that we give attention to, as the regulatory program has  
17 migrated.

18 MR. WEST: In addition, and I am probably getting  
19 ahead of you, but the next bullet, the fact that we are  
20 finding things that wouldn't have been found through the  
21 core inspection --

22 CHAIRMAN JACKSON: By the core inspection, that's  
23 right.

24 MR. WEST: -- that underscores even more, I  
25 believe --

1 CHAIRMAN JACKSON: I understand. That's the  
2 point. That's why I raised the issue about the baseline.  
3 What is the baseline?

4 MR. WEST: Yes, Chairman.

5 I don't think we really thought about the core  
6 inspection program too much before we started the FPFIs but  
7 once we got into doing a couple pilots it became obvious  
8 that there were problems out there that were not found by  
9 our core inspection or licensee self-assessments that were  
10 based on the core inspection, and in hindsight when we  
11 thought about it, we said that that really shouldn't be too  
12 surprising because the core program is set up more along  
13 looking at classical fire protection lines and it wasn't  
14 looking at the engineering issues. It wasn't looking at  
15 design issues. It wasn't looking at configuration control.

16 Our theory is that there was a feeling, not a  
17 feeling but we had done Appendix R inspections after plants  
18 originally complied with Appendix R in the early to mid-'80s  
19 and during those inspections we verified that the barriers  
20 were there, the seals were there, the sprinkler systems were  
21 there, and there may have been a feeling that once that was  
22 done it was treated more as a milestone, and all we needed  
23 to do in the future was go back and just make sure the  
24 barrier was still there.

25 So the inspector might say, just see a barrier and

1 say, you know, they're done when in fact no one had really  
2 looked at the document base behind the barrier or whether  
3 plant mods have made that could have invalidated the safe  
4 shutdown capability, so --

5 CHAIRMAN JACKSON: Well, the key is the second "F"  
6 in FPGI -- you know the "functional" inspection.

7 MR. WEST: Yes, ma'am. Absolutely.

8 CHAIRMAN JACKSON: And -- okay, I am going to stop  
9 talking. You have got the message, I'm sure.

10 MR. WEST: I think I have gone over my time. I'll  
11 try to hurry up.

12 I think in the -- I am not sure if we have  
13 reported it but if you just go through the six inspections  
14 that I mentioned earlier and you just do a simple count of  
15 anything that was identified as a problem or a weakness or a  
16 finding or an unresolved item, we had 140 separate items and  
17 obviously they had varied safety significance.

18 Some were little to no safety significance and  
19 some were of more safety significance. To cover those could  
20 be another whole briefing.

21 We did find through Prairie Island we believe that  
22 the licensee self-assessments that would be based on an FPGI  
23 techniques could be beneficial as a way to continuing to  
24 achieve a good level of fire safety within industry.

25 COMMISSIONER McGAFFIGAN: Madam Chairman?

1 CHAIRMAN JACKSON: Yes, please.

2 COMMISSIONER McGAFFIGAN: He flew past the 140  
3 times and said it would take a whole briefing, but could you  
4 describe the single most safety significant item you found,  
5 just to give a ballpark?

6 MR. WEST: That's really going to be a judgment  
7 call. I mean I'll tell you some that we --

8 COMMISSIONER McGAFFIGAN: A significant --

9 CHAIRMAN JACKSON: "A" --

10 COMMISSIONER McGAFFIGAN: A significant.

11 MR. WEST: Well, for example, an issue that, a  
12 finding that we believe was significant we found during our  
13 first FPFI at River Bend and it was a situation where they  
14 had a cable that if there was a fire involving that cable  
15 and they had a certain type of fire-induced fault all of the  
16 safety release valves could inadvertently open, so that  
17 would be an example of a significant, what we believe to be  
18 a significant finding. The licensee has corrected that  
19 problem.

20 Something that would be less significant may be an  
21 isolated example of combustible controls procedures not  
22 being followed -- maybe a little too much combustibles in an  
23 area that that shouldn't be there, so there really is a  
24 large range, and different people will place things in  
25 different bins -- high, medium, or low.

1 CHAIRMAN JACKSON: Did you ever take a look at  
2 where combustible gases are stored?

3 MR. WEST: Yes, ma'am. We did it as part of the  
4 FPFIs and it has also been something the agency has looked  
5 at several times. There were generic safety issues  
6 involving combustible gases, and there is guidance on  
7 combustible gases --

8 CHAIRMAN JACKSON: But things come up from time to  
9 time.

10 MR. WEST: Yes, ma'am. Just quickly, to finish up  
11 Slide 12, as I have mentioned, we do think we did renew  
12 industry attention on reactor fire safety and in the  
13 workshops NEI and others did say that we should take some  
14 steps to ensure that we stay there. We shouldn't just back  
15 off completely and let things backslide.

16 We didn't find any significant problems with our  
17 Reactor Fire Protection Program, looking at Appendix R and  
18 IPEEE and the various guidance documents. We didn't find  
19 any gaping holes where there was a fire safety issue that  
20 had not been adequately addressed.

21 Again, there may have been some problems in  
22 implementation but it appears that the regulatory  
23 framework's health is sound.

24 CHAIRMAN JACKSON: So you are saying that as long  
25 as licensees implement the regulatory framework

1 appropriately, then there is not a problem?

2 MR. WEST: Some may say as long as they implement  
3 it the way we think it should be implemented --

4 CHAIRMAN JACKSON: As you define it --

5 MR. WEST: As we define it -- there is not always  
6 total agreement, and that has been one of the problems. As  
7 we said, circuit analysis in an area where we think the  
8 basic requirements are sound, but there could be confusion  
9 in the implementation and we are taking action to address  
10 that.

11 My last slide is Slide 13, before we move into  
12 IPEEE, but what do we have left to do? I think we have  
13 touched on all of these. I won't go over them again, but we  
14 are looking at developing a method for assessing the risk  
15 significance of fire protection deficiencies.

16 We have this big meeting in a couple of weeks.  
17 Hopefully we will come out of that with something we can  
18 use. We do want to actually assess the risk significance so  
19 we can come up with a consensus on the FPGI findings or at  
20 least the important ones, so we can report those to you in  
21 our final report.

22 Continuing our assessment of the lessons learned,  
23 we do have from NEI a proposal for an industry initiative  
24 that would continue some level of fire protection  
25 inspections in industry. Basically they are proposing a

1 phase-out of FPFIs as a routine type of inspection, to be  
2 replaced with licensee-managed self-assessments.

3 We would have oversight of those self-assessments  
4 through the new performance assessment and inspection  
5 program. We would still have some level of baseline  
6 inspection and if a plant gets into a certain range -- you  
7 know, the green, yellow, white -- then we may warrant a  
8 FPGI.

9 But we are looking at the NEI proposal.

10 CHAIRMAN JACKSON: Commissioner McGaffigan?

11 COMMISSIONER MCGAFFIGAN: Part of the NEI proposal  
12 is to develop fire-protection performance indicators, and,  
13 you know, the notion generally in this assessment process is  
14 where there are indicators we will inspect less, and where  
15 there aren't indicators, we'll inspect more.

16 How difficult is it going to be to come up with  
17 indicators? I mean, I can count combustibles lying around  
18 on the floor or whatever, but, you know, the one you cited,  
19 the cable -- the analysis which leads to the conclusion  
20 that, you know, if our induced faults could have all the  
21 safety valves -- relief valves open, that doesn't sound like  
22 something that you're going to have a performance indicator  
23 on very readily.

24 MR. WEST: We in the industry have acknowledged  
25 that it would be very difficult, it would be challenging.



1 We had, when we met with the ACRS subcommittee and full  
2 committee last week, they also agreed that it would be  
3 difficult, but they seemed to believe it could be done. We  
4 really need to think about that before I could give you  
5 specific examples.

6 I mean, you've given some examples, and certainly  
7 those could be performance indicators. It may not be -- it  
8 may end up that it's not very discrete items like, you know,  
9 how well is your surveillances or maintenance of sprinkler  
10 systems. It may be a more general type of indicator like if  
11 you do a self-assessment, you need to look at the results of  
12 the self-assessment and consider what that means to the  
13 health of your fire-protection program.

14 CHAIRMAN JACKSON: Okay. I think we'd be  
15 interested in -- the Commissioner wants to hear NEI's, you  
16 know, commentary in this area. But I just wanted to mention  
17 to Commissioner McGaffigan, the baseline inspection program  
18 is meant to cover areas where there are no --

19 COMMISSIONER MCGAFFIGAN: Right.

20 CHAIRMAN JACKSON: Indicators, and to validate --

21 COMMISSIONER MCGAFFIGAN: Validate. I understand.

22 CHAIRMAN JACKSON: So that would help --

23 COMMISSIONER MCGAFFIGAN: More --

24 CHAIRMAN JACKSON: Right, but that would help  
25 in --

1 COMMISSIONER MCGAFFIGAN: But the thrust of this  
2 briefing so far has been that maybe a larger part of the  
3 baseline inspection program than perhaps is currently  
4 planned needs to be focused on fire.

5 CHAIRMAN JACKSON: Right. That's an interesting  
6 point, or at least fire needs to be squarely addressed as  
7 part of that.

8 MR. TRAVERS: It could be viewed as similar to  
9 some of the issues that have been raised on design basis and  
10 how you get to a comfort and confidence level, you know,  
11 because of the lack of good performance indicators.

12 CHAIRMAN JACKSON: Right. Right.

13 COMMISSIONER DICUS: Do you think that this  
14 self-assessment program would keep the licensees focused on  
15 fire protection? Because apparently they've wandered off  
16 from being focused on that, which is part of what we're  
17 doing here.

18 MR. WEST: Well, at this point we're really still  
19 considering that. It's not clear, and we need to have  
20 additional interaction with NEI as to exactly whether this  
21 would be a voluntary initiative or whether NEI is going to  
22 recommend or make a stronger recommendation that licensees  
23 do it. And we would imagine if we bought into this type of  
24 approach there would be some period of maybe a higher level  
25 of oversight to really try to gauge that licensee's --

1 CHAIRMAN JACKSON: Commitment to the --

2 MR. WEST: Commitment to the program.

3 I think in the -- just to make one other comment  
4 about performance indicators -- I believe in the development  
5 of the oversight, the new oversight process, the team looked  
6 at performance indicators for fire, and basically they said  
7 the only one that made sense was the number of fires, but  
8 then they concluded that that really -- that's a good  
9 performance indicator, but you can't do that.

10 Anyway, we're going to -- we have this work to  
11 complete. We have a lot to think about. We have a lot to  
12 work out. And in the end we will give you a final report in  
13 April which will lay out, you know, what we've done, why we  
14 did it, what we believe the viable options are for the  
15 future and what our recommendation will be.

16 CHAIRMAN JACKSON: And you are looking to factor  
17 it into the new oversight.

18 MR. WEST: Yes, ma'am, we definitely are.

19 CHAIRMAN JACKSON: Okay. This is April?

20 MR. WEST: Yes, ma'am.

21 CHAIRMAN JACKSON: The final report?

22 MR. WEST: Yes, ma'am.

23 CHAIRMAN JACKSON: Okay. All right.

24 MR. WEST: That concludes my presentation. If  
25 there are no more questions --

1 CHAIRMAN JACKSON: Counting the number of fires is  
2 like going down the highway at 100 miles an hour and when  
3 you've passed a red barn, you've gone too far.

4 MR. WEST: Alan Rubin will be the next --

5 MR. RUBIN: Good morning. My name is Alan Rubin.  
6 I'm section chief for the PRA Branch of the Office of  
7 Research.

8 And in the interest of time, I'm going to be  
9 covering two topics with three slides total, try to be  
10 concise. However, there are additional backup slides which  
11 are provided in your package to provide some additional  
12 information.

13 I'm going to talk about the IPEEE program and the  
14 fire risk assessment research program.

15 First, in the IPEEE program, that's on slide 14,  
16 we originally anticipated that there would be 74 submittals  
17 from licensees. However, four plants have permanently shut  
18 down, and we've completed the preliminary reviews of all 70  
19 submittals to date. We have also completed final reviews  
20 and issued staff evaluation reports for 11 library  
21 submittals. And the reviews are being conducted in a  
22 similar fashion to the way the IPE program was done.

23 It involves quite a significant number of steps  
24 along the way. I won't get into them in this meeting. But  
25 just to again focus what the attention of the reviews are,

1 we're looking to see whether the licensee submittals are  
2 complete, whether they're reasonable, whether they have  
3 significant gaps, whether they have significant problems in  
4 the assumptions or the analysis or the methods in the  
5 program. We're particularly focusing to see if the  
6 assessments can address plant-specific severe accident  
7 vulnerabilities, which is really to meet the overall  
8 objectives of the IPEEE program.

9 In addition to that, we're also looking to see how  
10 specific generic safety issues that relate to IPEEEs are  
11 being addressed and resolved, and I'll talk a little bit  
12 about that on the next slide.

13 In January of last year we provided a report to  
14 the Commission that included preliminary perspectives from  
15 the review of the submittals that were conducted up to that  
16 time which were about a third to one-half of the submittals.  
17 And let me just highlight some of the major conclusions from  
18 that, and they really haven't changed since then. But I  
19 think they're important to just go over again.

20 First we've seen that many licensees have  
21 implemented improvements at their plants, made modifications  
22 to improve plant safety. They include both procedural  
23 modifications such as improving fire protection, fire  
24 response procedures, improving administrative procedures for  
25 transient combustibles, and they've made some hardware

1 improvements as well, such as relocating cables out of fire  
2 areas, made improvements to their fire-suppression systems,  
3 and several others. There's a backup slide that provides  
4 some more examples in your package.

5 In the fire area, about half the plants' licensees  
6 have made improvements to their plant. That's a substantial  
7 number. And overall in the IPEEE program about 80 percent  
8 of licensees have made some improvements, which is either  
9 fire, in the seismic area, or high winds, floods, and other  
10 external events.

11 We've seen from results in the submittals that  
12 fire events can be a significant and in fact a dominant  
13 contributor to core damage frequency, to the total core  
14 damage frequency at the plant. The range of core damage  
15 frequencies reported by licensees is from 10 to the minus 7  
16 to on the order of 10 to the minus 4 per reactor year.

17 We make an important point about I'd say the  
18 comparing of core damage frequencies between plants or even  
19 between IPE's and IPEEE's. Anyone who's got a number is  
20 going to make a comparison, but it's got to be done with  
21 caution. There are some significant things I want to point  
22 out to demonstrate where a comparison is not really  
23 straightforward.

24 Similar conclusions were drawn from the IPE  
25 program. First, there were differences in the modeling

1 assumptions that analysts have made. And you've seen the  
2 significant difference in the example already at Quad Cities  
3 what that can do. There are differences in methods that are  
4 used. These were approved methods that were put out in  
5 guidance for doing IPEEE's. And there are acceptable  
6 methods that differ from submittal to submittal. And  
7 there's also a difference in the level of detail themselves  
8 in the submittals from one plant to another.

9 COMMISSIONER McGAFFIGAN: Madam Chairman?

10 CHAIRMAN JACKSON: Yes, please.

11 COMMISSIONER McGAFFIGAN: We had ACRS in last week  
12 and we were talking about elevating core damage frequency to  
13 a safety goal, and it strikes me that we've just been warned  
14 by the staff that, you know, not to trust these overall  
15 numbers, which is a conversation we also have had with ACRS.  
16 But how could we get -- I mean, if we ever do go down the  
17 line of making core damage frequency a safety goal, do we  
18 have to standardize these methods and have a standard  
19 method, a standard level of detail, you know, in order to  
20 get the comparability across?

21 MR. RUBIN: Simple answer, in my view, yes, I  
22 think so. I mean, we were looking at the, you know, reviews  
23 not so much focusing on the quantitative number --

24 COMMISSIONER McGAFFIGAN: Looking at relative --

25 MR. RUBIN: We're looking at relative risk at the

1 plant to see whether the licensee has done that.

2 COMMISSIONER MCGAFFIGAN: Right.

3 MR. RUBIN: But for the objective that you're  
4 talking about, yes, I think you would need some kind of a  
5 standard. And a standard is being developed for the  
6 internal events PRA, and you're aware of that, and certainly  
7 in the IPEEE that could be as well.

8 CHAIRMAN JACKSON: But when you get to the  
9 IPEEE's, your uncertainties --

10 MR. RUBIN: State of the art is different.

11 CHAIRMAN JACKSON: But nonetheless, your point is  
12 well taken.

13 MR. RUBIN: Okay. Going on to the next slide, I  
14 just wanted to focus on areas in addition to the  
15 plant-specific reviews where the staff and industry is using  
16 risk information from the IPEEE program. First, as I  
17 mentioned, the licenses have made improvements to their  
18 plants in a number of areas. In addition to that, the staff  
19 has used the IPEEE program to identify or to help identify  
20 and prioritize the fire risk research program. For example,  
21 at Quad Cities we saw that the area of turbine building  
22 fires can be a significant contributor, and that's part of  
23 the fire risk assessment research program.

24 We're also looking at how the submittals can  
25 address and resolve specific IPEEE-related generic safety



1 issues. Brian Sheron mentioned there are about a dozen of  
2 those in the fire area.

3 CHAIRMAN JACKSON: Could you give us one, using  
4 Mr. McGaffigan's technique, give us one example?

5 MR. RUBIN: Yes, the effects of smoke on manual  
6 fire suppression is one example. It's a fire-risk coping  
7 study issue. Seismic fire interaction is another issue.  
8 Okay. There are again twelve in the fire area.

9 CHAIRMAN JACKSON: Are you doing this yourselves?  
10 Are you doing it with international cooperation? How is it  
11 working?

12 MR. RUBIN: No, this is not being done -- the  
13 reviews are not being done --

14 CHAIRMAN JACKSON: No, I'm talking about the  
15 research program.

16 MR. RUBIN: The research program, yes. I will get  
17 into that. It's done in a collaborative, cooperative  
18 program with both international participants as well as  
19 industry and economic.

20 CHAIRMAN JACKSON: Okay.

21 MR. RUBIN: Yes. You're at the conclusion of my  
22 last bullet.

23 CHAIRMAN JACKSON: Oh, I'm so sorry.

24 MR. RUBIN: There are 25 issues that are being  
25 addressed in the IPEEE program, including one unresolved

1 safety issue, one shutdown decay heat removal requirements,  
2 seven generic issues of which some have nine to seven to ten  
3 subparts in them as well as fire-risk scoping study issues.  
4 And the resolution of each of those issues is documented in  
5 each plant's staff evaluation report.

6 Of the reports we've completed to date, we've seen  
7 that not all issues were resolved in each plant, and for  
8 those cases, there will be followup by the staff, either on  
9 a generic basis or a plant-specific bases if an issue is not  
10 resolved.

11 However, in large part we are finding that the  
12 issues are being addressed and the IPEEE's are adequate to  
13 resolve a number of issues.

14 The fourth area that we're using risk information  
15 is to provide input to NRR and prioritization of areas for  
16 fire plant inspections. Which areas, for example, in the  
17 IPEEEs are showing up as dominant risk contributors? And  
18 that's very useful information that's input to where fire  
19 protection inspections can focus their activities.

20 CHAIRMAN JACKSON: Doesn't that help you get at  
21 the issue of the risk significance of inspection findings  
22 themselves?

23 MR. RUBIN: That's the other side of the coin.  
24 This is an input to the --

25 CHAIRMAN JACKSON: Right.

1 MR. RUBIN: Risk program. The other side, as  
2 we've probably -- I'll talk a little bit -- may need some  
3 new tools or additional tools, to help assess what the risk  
4 significance is of the findings.

5 CHAIRMAN JACKSON: Were you going to talk about  
6 that?

7 MR. RUBIN: I'll talk about that when I get into  
8 the --

9 CHAIRMAN JACKSON: Okay.

10 MR. RUBIN: Fire risk assessment.

11 CHAIRMAN JACKSON: Fine. I'll wait.

12 Commissioner Merrifield has a question, I think.

13 COMMISSIONER MERRIFIELD: I was going to wait till  
14 his next point and ask my question.

15 MR. RUBIN: Okay. Next point I'm certain is of  
16 interest to the Commission. In fact, in response to a  
17 Commission SRM that was issued in June of last year, we're  
18 assessing the effect of exemptions to Appendix R on fire  
19 risk, and this stemmed initially from Quad Cities, and there  
20 are other overall significant impacts on exemptions.

21 CHAIRMAN JACKSON: Do you have any preliminary  
22 results?

23 You knew I was going to ask that.

24 MR. RUBIN: I knew you were going to ask that.  
25 And I was going to tell you we are on schedule for

1 providing a report to the Commission in May of this year,  
2 which is consistent with the SRM.

3 It's a challenging and difficult activity, as  
4 we've seen. It depends on the level of detail we need to  
5 get into. Is there enough information in the IPEEE's  
6 themselves? Do we have the event trees and fault trees to  
7 do an adequate assessment? And let me just tell you the  
8 methodology of the approach that we're doing, see if that  
9 satisfied you temporarily. You'll still be here in May.

10 CHAIRMAN JACKSON: I'm looking forward to your --  
11 [Laughter.]

12 And I'll even be around a little while after that.

13 MR. RUBIN: We don't have the time or resources to  
14 look at all 70 submittals, but we've picked ten plants,  
15 those which have reported the higher core damage  
16 frequencies, on the order of about 10 to the minus 4th. And  
17 the range of exemptions for those plants is from three to  
18 more than 20 per plant, typically nine or ten exemptions for  
19 each plant that we're looking at.

20 To assist the risk significance, we're asking  
21 three questions. The first one is do the exemptions, can  
22 they contribute to a significant increase in the total core  
23 damage frequency at the plant. That's an obvious question.  
24 The second question is can the exemptions contribute to a  
25 change in the dominant risk contributors or profile of risk

1 at the plant. And, thirdly, can the exemptions contribute  
2 to a change in plants' reliance on various fire protection  
3 functions.

4 So I think with those three questions in mind, you  
5 can see it's a challenging issue. We're in the midst of  
6 doing that review. We have some contractor support to help  
7 us in that area. And we're working actively to get the job  
8 done.

9 CHAIRMAN JACKSON: Commissioner Merrifield I think  
10 had a question.

11 COMMISSIONER McGAFFIGAN: Yes, mine goes to sort  
12 of the cumulative effect of the exemptions. I mean, we do  
13 have a number of exemptions out there, and many of them --  
14 at individual plants. And do we have a good safety valve, a  
15 good safety check to make sure that that one additional  
16 exemption does not have in combination with all the other  
17 exemptions we've given --

18 CHAIRMAN JACKSON: That's part of what you're  
19 looking at --

20 MR. RUBIN: We're trying to assess for each  
21 exemption is there a contributor, is an exemption -- does it  
22 affect an area that's a high-risk contributor, a dominant  
23 risk contributor for the plant. And we're trying to bin  
24 those -- to answer your question that, you know, the  
25 incremental or the marginal increase in risk, that's going

1 to be a tough one.

2 CHAIRMAN JACKSON: But wasn't it true -- well,  
3 before this analysis exercise -- that at least in a certain  
4 instance at Quad Cities that you had exemptions that  
5 overlaid with each other in terms of their net effect on the  
6 plant?

7 I mean, that was my understanding in at least one  
8 instance with Quad Cities specifically.

9 Mr. West.

10 MR. WEST: I'll try to address that.

11 When we originally went to Quad Cities after they  
12 submitted the IPEEE, we thought that that may be the case.  
13 And we did find one exemption where we thought it  
14 contributed to a vulnerability, and the licensee took action  
15 to correct that problem, although they've indicated that in  
16 risk space it really was not significant, but in practical  
17 terms it could create a problem for plant shutdown.

18 We met with the licensee again in December of this  
19 year, and they have gone through and did a detailed  
20 assessment of their exemptions including the cumulative  
21 effects of exemptions. And they stated in the meeting that  
22 none of the exemptions where the cumulative effect was not a  
23 significant contributor to fire risk.

24 We didn't have a chance in that meeting to get  
25 into the details of their analysis, but we're scheduling a

1 followup meeting at the site in March where we're going to  
2 meet with them and go through in detail the assessments and  
3 analyses that they did to reach those conclusions, because  
4 we're -- you know, we're interested to find out how they did  
5 it and how they got to the conclusions they got. So we  
6 would know more in March.

7 CHAIRMAN JACKSON: Commissioner, you were asking  
8 the question relative to cumulative effect at a plant or  
9 cumulative effect across the industry?

10 COMMISSIONER MERRIFIELD: I was looking at the  
11 cumulative effect at a plant, an individual plant.

12 CHAIRMAN JACKSON: Right.

13 COMMISSIONER MERRIFIELD: Do we have the right  
14 assessment mechanism to be able to gauge that as we had  
15 additional exemptions?

16 CHAIRMAN JACKSON: Why can't that analysis --

17 MR. RUBIN: We'll keep that in mind, that is a  
18 valid point, as we do this. We are in the midst of doing  
19 that, and we will keep that in mind.

20 CHAIRMAN JACKSON: But I thought I had already  
21 asked you to do that sometime ago. No, I had. That was  
22 exactly the point at Quad Cities, was whether there was a  
23 cumulative effect of the exemptions. And so if you can't  
24 answer that for us, then we have no ability to answer the  
25 question.

1 MR. RUBIN: No, that is part of it. We are doing  
2 them separately, but we will combine each of the exemptions  
3 to see what the cumulative effect is.

4 CHAIRMAN JACKSON: Okay.

5 MR. RUBIN: The last point on the slide is just to  
6 point out that both -- another use of risk information from  
7 the IPEEE program, both by the staff and industry, is to  
8 incorporate lessons learned from the risk insights from  
9 IPEEE into the NFPA standard. And I mentioned a little  
10 earlier where the appendix being developed for that  
11 standard, which focuses on the site risk evaluation, will  
12 provide guidance for NFP 805.

13 Just to conclude that final statement, that we  
14 will issue a final IPEEE report after all the individual  
15 plant evaluations are completed.

16 Let me move on to the next slide on the fire risk  
17 assessment research program. I would like to acknowledge  
18 Dr. Nathan Siu, sitting in the audience, who has got the  
19 lead for this program. He is raising his hand right over  
20 there. And just make a couple of points with regard to this  
21 program.

22 As the agency and the Commission has moved towards  
23 more risk-informed, performance-based regulation, there  
24 certainly is a need for robust fire risk assessment methods,  
25 tools and data to support those activities. We know there



1 are some weaknesses in the current state of the art in FRA,  
2 fire risk assessment, and, in fact, we have seen how that  
3 can contribute to variability in the IPEEEs in other plant  
4 assessments.

5 There have been weaknesses that have been  
6 identified in fire risk assessments, and improvements, work  
7 has started -- was initiated to address some of those  
8 weaknesses. For example, analyses or data for fire  
9 frequencies, fire modeling, looking at thermal fragilities  
10 of cables, looking at circuit failures, which was brought up  
11 earlier, are some of the areas that are in the program.

12 And then SECY-98-30, which was provided to the  
13 Commission in October '98, summarizes the key research  
14 findings from the fire research program, as well as needs  
15 for improvements.

16 And the last point goes to your question, Chairman  
17 Jackson, in order to leverage our resources, the fire risk  
18 program involves collaboration with industry, that includes  
19 NEI and EPRI, with academic, with universities, with  
20 government, for example, NIST, and with international  
21 organizations. And, as I said earlier, that program will  
22 have significant improvements by the end of 2000, but there  
23 are products that have been developed and will be developed  
24 before that time period.

25 CHAIRMAN JACKSON: Okay.

1 MR. REYNOLDS: Good morning. Let me pull this  
2 over. Okay, there we go. In the interest of time, I will  
3 just stick to my prepared remarks, and we will start with  
4 slide 17.

5 As you may recall, Quad Cities shut down both Quad  
6 Cities' units in the fall of 1997 due to significant  
7 discrepancies between the safe shutdown analysis and the  
8 safe shutdown implementing procedures, and the resultant  
9 potential increased risk of damage from fire. Commonwealth  
10 Edison then undertook a number of corrective actions to deal  
11 with the identified fire-related safe shutdown deficiencies  
12 and to support plant restart.

13 The licensee revised and validated the safe  
14 shutdown analysis for each unit. They revised and validated  
15 and approved their safe shutdown implementing procedures.  
16 Additionally, the licensee implemented a number of enhanced  
17 fire protection compensatory measures in the high risk plant  
18 areas. These included fire watches, enhanced controls over  
19 combustible materials, enhanced controls over activities  
20 than represented increased fire risk like welding and  
21 grinding.

22 The licensee also augmented the additional  
23 operating shift crews with one additional staff member per  
24 shift to ensure they had sufficient personnel to be  
25 available to perform safe shutdown activities.

1 Additionally, the licensee provided training to the  
2 operational personnel and all other personnel required to  
3 implement the new safe shutdown actions.

4 And in May of 1998, the NRC reconducted a  
5 comprehensive inspection of their safe shutdown corrective  
6 actions, and at that end of that inspection, the staff  
7 concluded that the Quad Cities' safe shutdown analysis, and  
8 their implementing procedures, along with the compensatory  
9 measures I just mentioned above, were acceptable to support  
10 plant restart for both units. And subsequent to the  
11 inspection in late May, both units restarted.

12 Moving on to slide 18. Since plant restart, the  
13 licensee has continued to take actions to reduce the Quad  
14 Cities' fire risk and to improve the safe shutdown  
15 capabilities. In November of 1998, the licensee completed a  
16 revised core damage frequency assessment for Quad Cities'  
17 Unit 1. This improved risk assessment resulted in a core  
18 damage frequency of 6 times 10 to the minus 5 per reactor  
19 year. As you have earlier, this is a significant  
20 improvement over the core damage frequency of 5 times 10 to  
21 the minus third, which was included in the Quad Cities'  
22 IPEEE which was submitted to us in 1997.

23 CHAIRMAN JACKSON: So the 6 10 minus 5 is a Unit 1  
24 number?

25 MR. REYNOLDS: Right.

1 CHAIRMAN JACKSON: What about Unit 2?

2 MR. REYNOLDS: They haven't finished that  
3 analysis. Based on discussions with them, they think it is  
4 going to be about the same.

5 CHAIRMAN JACKSON: The 5 10 minus 3, that was for  
6 both reactors?

7 MR. REYNOLDS: Yes, ma'am.

8 CHAIRMAN JACKSON: So it wasn't done on a per  
9 reactor basis?

10 MR. REYNOLDS: Right.

11 CHAIRMAN JACKSON: Okay.

12 MR. REYNOLDS: The two major factors in reducing  
13 the risk between the 1997 and the IPEEE and the one they  
14 just finished in November was a more accurate understanding  
15 and determination of actual cable routings, where the cables  
16 are, and a reduction in the conservatism of the fire  
17 modeling. Knowing the actual cable routings allowed the  
18 licensee to identify a number of additional components that  
19 would be available to achieve safe shutdown. These pieces  
20 of equipment had been previously assumed to be unavailable  
21 due to fire damage.

22 The licensee is still continuing to implement a  
23 number of actions to improve their safe shutdown  
24 capabilities. These include a better safe shutdown system  
25 optimization, a reduced unit interdependent study, and a

1 cable separation study. Additionally, the licensee has  
2 implemented a number of plant modifications which have  
3 resulted in improved safe shutdown and performance.

4 CHAIRMAN JACKSON: Now, is that part of 6 10 minus  
5 5, of is that above and beyond that?

6 MR. REYNOLDS: A little of both. They have  
7 completed insulation of some pathway fire barriers, that was  
8 included in the change. And then they have relocated some  
9 critical cables. And they are going to plan additional  
10 changes. Some of those include they are going to have  
11 modification to the safe shutdown makeup pumps, the station  
12 blackout diesel generator control circuit, and they have  
13 changes to the reactor -- excuse me, the high pressure  
14 coolant injection system, and they are going to do  
15 modifications to the fire protection features in the reactor  
16 feedpump areas.

17 CHAIRMAN JACKSON: Are you able to include the  
18 effect of fire watches on the mitigation of core damage  
19 frequency due to fire, can you model that in a PRA?

20 MR. REYNOLDS: I'll let you try to answer that  
21 one.

22 MR. RUBIN: The question is, can you model the  
23 effect of fire watches in the PRA?

24 CHAIRMAN JACKSON: Correct.

25 MR. RUBIN: Our expert is shaking his head no.

1 Dr. Siu is our fire PRA expert. Do you want to expand on  
2 that?

3 DR. SIU: Chairman, at this moment, fire  
4 frequencies are estimated based on statistical data, and  
5 those data generally don't include whether or not a watch  
6 was available. You can sometimes infer that the fire was  
7 started by people who by there, and you can say, well,  
8 there's -- you know, obviously, it was detected quickly.  
9 But as far as fire frequency effects go, we don't have a way  
10 to measure that.

11 CHAIRMAN JACKSON: Is that an issue, when one  
12 thinks about compensatory measures that involve fire  
13 watches?

14 DR. SIU: It is certainly an issue. Whether it is  
15 one that we can really deal with in research space, I am not  
16 sure.

17 CHAIRMAN JACKSON: Okay. Thank you.

18 MR. RUBIN: Is that it?

19 MR. REYNOLDS: Just the last point I wanted to  
20 make is the NRC staff, both NRR and Region III, is going to  
21 continue interact closely with the licensee as they continue  
22 to make improvements.

23 CHAIRMAN JACKSON: Are there other plants with  
24 similar issues, if not the same core damage frequency  
25 numbers as Quad Cities? There were some questions about

1 Salem and the Salem restart. I mean that is not in your  
2 region, but --

3 MR. REYNOLDS: I will tell you the next one we are  
4 worried about is Dresden. Dresden has a 10 to the minus 4  
5 number and they are basically in the same spot where Quad  
6 Cities was. They didn't do a good job of understanding  
7 where all their cables are, so they are in process.

8 MR. TRAVERS: They are in the midst of a  
9 reanalysis?

10 MR. REYNOLDS: Right. And they are right behind  
11 Quad Cities. I don't know if you wanted to speak to Salem.

12 MR. RUBIN: Salem doesn't come to mind as a real  
13 plant that had a significant problem, but there was no plant  
14 that had 10 to the minus third core damage frequencies.  
15 There were a number of plants, approximately 10, that had on  
16 the order of 1 to 4 times to the minus fourth core damage  
17 frequency, and Dresden was among those 10.

18 CHAIRMAN JACKSON: I think Salem had an issue  
19 having to do with fire penetration seals. Anyone want to  
20 speak to the fire penetration seal issue?

21 MR. TRAVERS: Do you know, Steve, about Salem?

22 MR. WEST: Yes, ma'am, I can address that. Salem,  
23 prior to the restart of Salem, NRR assisted Region I in a  
24 fire -- a couple of fire protection inspections there, and  
25 the inspectors did identify a minor problem with the fire

1 barrier penetration seals. It was basically a documentation  
2 problem, which I understand has been resolved. The more  
3 significant problem was the fire barriers themselves that  
4 were installed at Salem to protect electrical raceways.

5 There were questions about the qualifications of  
6 those barriers and the licensee, prior to restart, committed  
7 to a program to correct that, and they are into that  
8 program. They have done some testing and there's meetings  
9 between Region I and NRR and the licensee to review  
10 progress.

11 CHAIRMAN JACKSON: Okay. Thank you very much.

12 MR. TRAVERS: That completes our presentation.

13 CHAIRMAN JACKSON: We will now hear from our  
14 second panel, Mr. Ralph Beedle, a Senior VP of NEI, Mr.  
15 David Modeen from NEI and Mr. Anthony O'Neill, who is Vice  
16 President of Government Affairs for NFPA, National Fire  
17 Protection Association.

18 MR. O'NEILL: Good morning, Madame Chairman.  
19 Would you like the NFPA, National Fire Protection  
20 Association, to go first? You had introduced us in that  
21 order, and that is fine with us. It is up -- it is your  
22 choice.

23 CHAIRMAN JACKSON: Actually, I introduced you in  
24 opposite order, but it's okay. You all decide.

25 MR. O'NEILL: Okay. We will do it that way, and



1 perhaps the projectionist can come to the NFPA logo slides  
2 and we will start there.

3 Good morning and my name is Tony O'Neill, and I am  
4 Vice President of Government Affairs at the National Fire  
5 Protection Association. We are certainly pleased to be here  
6 We -- NFPA has appeared a couple of times in front of the  
7 ACRS, but this is the first time we have had an opportunity  
8 to appear before the full Commission.

9 As a way of introduction, over the years the NRC,  
10 the Department of Energy, the nuclear industry have used  
11 NFPA codes and standards regularly as a part of their  
12 program for assuring safety in the use of atomic energy. Of  
13 course, last year, as was mentioned by Chairman Jackson, we  
14 entered a new era of cooperation with the NRC, and with the  
15 support of NRC, the nuclear industry, insurance, specialists  
16 in a number of different fields, we started the development  
17 of NFPA 805, which has already been described.

18 Today, what I will do is give you a brief overview  
19 of NFPA and how we develop codes and standards through a  
20 national consensus process. And before I do that, though, I  
21 want to apologize for not having our Chairman of the  
22 Committee, Len Hathaway, here and Rich Belon, who is our  
23 Senior Engineer who is assigned to the project. Both of  
24 them are in Europe at this time and, in fact, are looking at  
25 methods and methodologies that are used in Europe for

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1 accomplishing the task at hand.

2 I would like to move to slide number 3, which goes  
3 past the introductory items, and start with just a brief  
4 overview of what NFPA is all about. The National Fire  
5 Protection Association was founded over a hundred years ago,  
6 and its purpose was to develop national consensus codes and  
7 standards and, over the years, that has been our primary  
8 purpose, although the Association has also evolved into a  
9 public safety advocate organization in a very general sense,  
10 including public education activities. We are a private,  
11 non-profit, voluntary codes and standards developer, and the  
12 Association's standards making activities are accredited by  
13 the American National Standards Institute.

14 What does that mean? It means that we, in our  
15 process, invite all effected and interested parties to  
16 participate in the codes and standards making activity, not  
17 only on the Committee, but in any way, shape, form in which  
18 those people, individuals would want to be involved in that  
19 process, and I will get into that a little bit more.

20 The process also is completely transparent, so  
21 that anyone can participate, and we will talk about that.  
22 And the process involves adequate due process to make sure  
23 that the standards are arrived at in a fair and equitable  
24 manner. We have members, close to 70,000 members in the  
25 United States and some 79 nations around the world.

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1 I would like to move to the next slide, slide  
2 number 4, and you will see that NFPA has been involved in  
3 providing codes and standards for the federal government use  
4 as we have with states, counties, cities, towns. The codes  
5 and standards are used by architects, engineers, designers.  
6 Many of them are adopted and referenced in building codes  
7 and they are widely used as a basis for underwriting and  
8 insurance, and, of course, they are used by industry.

9 In the federal government area, just to mention  
10 one or two of those that are listed on the slides, all  
11 Medicare, Medicaid funding eligibility to some 35,000  
12 healthcare institutions in the United States has as a  
13 prerequisite the compliance with the Association's life  
14 safety code, as an example.

15 Federal Aviation Administration, all the ground  
16 servicing, fueling and aircraft rescue, fire-fighting  
17 activities are governed by the NFPA codes and standards that  
18 deal with that.

19 Next slide, please. Starting in 1983, the Office  
20 of Management and Budget, through OMB A-119, required that  
21 federal government staff participate in the development of  
22 private sector standards and that the OMB circular urged the  
23 adoption of these standards in carrying out public policy.  
24 In 1996, that was codified into Public Law 104-113, the  
25 Technology Transfer Act, and I will quote from that. It

1 directs, "All federal agencies and departments shall use  
2 technical standards that are developed or adopted by  
3 voluntary consensus standards bodies using such technical  
4 standards as a means to carry out policy objectives."

5 Moving to the next slide, and I am going to move  
6 quickly because I know time is of essence here, but please  
7 stop me at any time in the presentation if you have any  
8 questions. Some of the more recent projects that have been  
9 requested by the federal government, in addition to the NRC  
10 project to develop 805, includes electrical safety  
11 requirements for work place, employee work places.

12 In the Environmental Protection Agency, we work  
13 very closely with them to develop a new clean agent fire  
14 extinguishing system to replace system -- and agents to  
15 replace the halogenated agents that were affecting the ozone  
16 layer. That is, of course, an extremely important milestone  
17 for the nuclear industry also, in that those agents are used  
18 in this industry as well.

19 Recently, the Coast Guard has, and we have just  
20 published a Merchant Vessel Fire Protection Life Safety Code  
21 for merchant vessels, or popularly known as cruise ships,  
22 and you know from the media that there have been major  
23 problems in those cruise ships in terms of fires at sea.

24 COMMISSIONER MERRIFIELD: If I may interrupt for a  
25 second.

1 MR. O'NEILL: Sure.

2 COMMISSIONER MERRIFIELD: And this raises this  
3 one. Of the types of projects you have done here recently  
4 for other federal agencies and departments, have any of  
5 those been risk-informed, performance-based approaches?

6 MR. O'NEILL: None of these that I have mentioned  
7 have risk-informed, risk-based approaches. However, the  
8 Life Safety Code, which I mentioned earlier, for Medicare,  
9 Medicaid, is developing alternatives which would include  
10 risk-based, and we have a couple of other documents in which  
11 our committees are also providing a separate parallel  
12 potential use of risk-based approaches. But this, the NRC  
13 project on 805, is the first project created from scratch in  
14 which we are developing risk-based.

15 CHAIRMAN JACKSON: How challenging is this proving  
16 to be for you?

17 MR. O'NEILL: It is quite challenging. However,  
18 as I mentioned earlier, we are on schedule. Your staff has  
19 been very heavily involved with us, as has the nuclear  
20 industry that will be represented here. And we are very  
21 confident, as a result of the meeting that occurred two  
22 weeks ago, that Mr. Connell mentioned, and I am being told  
23 this by our Committee and by our staff, that we will achieve  
24 the objective of bringing the project in on time, and that  
25 it will address the issues that are important to NRC.

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1 CHAIRMAN JACKSON: Do you have experts that you  
2 are able to draw upon independently of the industry or NRC?

3 MR. O'NEILL: Yes. Yes, we are --

4 CHAIRMAN JACKSON: You have capabilities in these  
5 areas?

6 MR. O'NEILL: Yes, we are.

7 CHAIRMAN JACKSON: Risk assessments and the like.

8 MR. O'NEILL: Yes, we have. And I would be glad  
9 to supply the names of the Committee to the Commission. We  
10 have also had ACRS involvement, as I said, formally, a  
11 couple of times here, plus they have been involved at the  
12 Committee meetings and the meeting that occurred a couple of  
13 weeks ago. And from then, we have received quite a bit of  
14 advice on how to achieve the input of experts.

15 Let me just mention two others that are not on  
16 here. This past year we were asked by the Department of  
17 Housing and Urban Development not a risk-based standard but  
18 to update the standards on the preemptive manufactured  
19 housing standard, which incidentally covers one-third of all  
20 new single-family dwelling construction in the United  
21 States. So in addition to the traditional State and local  
22 government adoption and Federal Government adoption, there  
23 have been a number of new projects.

24 The next slide, just to briefly talk about the  
25 process, as I mentioned earlier, the association standards

1 are accredited through the American National Standards  
2 Institute and do become American national standards. The  
3 process includes the involvement of some 5,400 committee  
4 members who volunteer their time for the various committees.  
5 We have over 200 committees working on various aspects of  
6 fire protection and some 290 -- I believe it's up to 300  
7 now -- documents, those would be code standards, recommended  
8 practices, and so forth.

9 A key ingredient of arriving at a consensus is  
10 that no more than one-third of the committee members may  
11 represent any one interest category, and it takes a  
12 two-thirds consensus to change the document, and that is the  
13 basis of our approach to developing a consensus document.

14 On the next page, as I mentioned earlier, our  
15 activities are hopefully completely transparent. This shows  
16 how any individual, any member of the public, any interested  
17 party or affected party can access the activities  
18 association, look at the draft standards and so forth, which  
19 were explained earlier, will be coming out this year.

20 The other thing that's --

21 CHAIRMAN JACKSON: Let me ask a question relative  
22 to the specific standards you're working to develop here.

23 MR. O'NEILL: Sure.

24 CHAIRMAN JACKSON: To what extent do organizations  
25 like the Union of Concerned Scientists and the Nuclear

1 Information Resource Service have access to the process?

2 MR. O'NEILL: They have complete access to this  
3 process in several ways. They can apply and become members  
4 of the committee, and we would welcome that, the actual  
5 technical committee that's putting together documents. They  
6 can access the committee reports on how they react to public  
7 proposals or committee proposals, all of which is published  
8 and is available on our Web site. And then there's a third  
9 step, and that is after the draft standards are published,  
10 then the committee must justify what they're -- how they're  
11 reacting to and whether accepting, rejecting, or what have  
12 you, each proposal.

13 That is then sent out again for a second review,  
14 and that second review, which is our review which is  
15 outlined in the schedule here, would also be available. We  
16 welcome and urge again all affected and interested parties  
17 to become fully active in the process. We however cannot  
18 demand or require them to become active in the process or  
19 access it. But we provide the facilities for that.

20 The only other thing I would make on that last  
21 slide was that we are the only private-sector  
22 standards-developing organization who puts notices in the  
23 Federal Register at our cost as to the status of each  
24 document. So it's another attempt to get widespread use and  
25 accessibility to the standard.



1 Now Mr. Connell earlier had gone through the last  
2 three slides that I have here, namely the status of the  
3 document, and to answer your question further, Chairman  
4 Jackson, after that February 19 date on the next -- that is  
5 due next week, after that the committee will meet on March  
6 16 and 18, and then the results of that activity will be  
7 published in what we call a report on -- the committee  
8 report on proposals. And then if you fast-forward then  
9 there's a public comment period where the public can review  
10 that and make comments back to the committee, and that would  
11 be that October 8 deadline, and then the final report will  
12 come out after December 27, 1999, and be available for  
13 public review and consideration.

14 Then in May of the year 2000 the NFPA  
15 membership -- the committee will present its report to the  
16 membership, in this case in Denver, Colorado, and at that  
17 meeting anyone who has made a proposal before or commented  
18 on the document has the ability to advance their proposal or  
19 their comment for consideration by the entire NFPA  
20 membership that are attending that meeting.

21 Then as indicated here the summer of the year 2000  
22 we -- by the way in these processes between the publishing  
23 of the standard there's also an opportunity for someone to  
24 appeal if they were not comfortable with the methods used by  
25 the committee and that type of thing. And then the

1 Standards Council, which is a body appointed by our board of  
2 directors, will issue the standard on July 20, year 2000.

3 And conclusions, the project is on schedule, and  
4 we'd be glad to answer any other questions that you might  
5 have.

6 COMMISSIONER McGAFFIGAN: Madam Chairman?

7 CHAIRMAN JACKSON: Yes, please.

8 COMMISSIONER McGAFFIGAN: Last year we had a  
9 meeting on codes and standards, and the main theme that came  
10 across from ASME and IEEE and others was the need for us on  
11 a concurrent basis if we're going to endorse a rule, endorse  
12 a standard through a rule, that we get that rulemaking done  
13 in parallel to the extent that it's practical rather than  
14 waiting for this process to complete and then start a  
15 rulemaking.

16 Looking at your schedule, it sounds like the final  
17 document's available -- is it's going to go to your members  
18 to vote in March of 2000. Is that the time frame we should  
19 be thinking about starting our proposed rulemaking so that,  
20 you know, sometime reasonably after the standard is  
21 finalized, if it's finalized, we could endorse it formally?

22 MR. O'NEILL: That is really your decision.

23 COMMISSIONER McGAFFIGAN: Right.

24 MR. O'NEILL: Agencies -- our experience has been  
25 that agencies -- some agencies use a parallel track, other

1 agencies will wait until the document is published, an  
2 official American national standard, then go into  
3 rulemaking. And I can give you examples of both of those.  
4 But it is your decision.

5 I would certainly, given the history of the  
6 process and your decision making up to this point, would  
7 assume, and from talking to your staff and so forth, that  
8 you may wish to parallel the two and get moving on the  
9 rulemaking.

10 COMMISSIONER MCGAFFIGAN: But March of 2000 would  
11 be about the time we could realistically start the process.

12 MR. O'NEILL: You will see the final draft  
13 standard that will be presented to the NFPA annual meeting  
14 and to our membership at the end of March 2000; correct.

15 CHAIRMAN JACKSON: Okay. Yes?

16 Oh, I'm sorry. Commissioner.

17 COMMISSIONER MERRIFIELD: No, I was just going to  
18 say it's certainly a deliberative process you use. There's  
19 plenty of opportunities for public comment. And there's a  
20 reason for that.

21 COMMISSIONER DICUS: Do you take a position at all  
22 on whether or not the implementation of the standard should  
23 be an all-or-nothing situation?

24 MR. O'NEILL: No, we do not have a position on  
25 that.

1 CHAIRMAN JACKSON: Let's see if we can move along.  
2 Mr. Beedle.

3 MR. BEEDLE: Commissioners, we appreciate the  
4 opportunity to discuss with you today some of our views on  
5 this risk-informing of the fire-protection standards.

6 Dave Modeen in a moment will discuss in some  
7 detail our views and involvement with this process.

8 First I'd like to mention that Jim O'Hanlon is the  
9 chairman of our working group. He's the senior  
10 vice-president of Virginia Power, very active in this  
11 process, and regrets that he was unable to be here today.

12 Before I turn to Dave, I'd like to make an  
13 observation concerning the previous panel's discussion with  
14 you and presentation. Clearly the NEI and the industry has  
15 been involved in this fire-protection effort, and we're  
16 certainly committed to it. And I would like to point out  
17 that the industry as a whole is very concerned about fire  
18 protection.

19 It's an economic issue. Insurance rates are  
20 predicated on keeping the plants free of fire hazards and  
21 ensuring that systems work properly, and to develop a notion  
22 that because we have a fire-protection functional inspection  
23 is the only reason that the industry really focuses on fire  
24 protection is an absolute mistake.

25 So I just want to make sure that we understand

1 that that's -- that the staff is not the reason that we're  
2 focused on fire protection.

3 Now, I think that when we talk about doing a  
4 functional fire-protection inspection and we spend money  
5 trying to prepare for it, I'm reminded of the time that I  
6 went through an inspection some years ago, and I do not  
7 recall ever having to worry about smart fires. But that's a  
8 problem that we have to deal with today. So as we go from  
9 on and on in this process, we develop more and more  
10 interpretations of the existing rules, and the plant staff  
11 have to deal with that. And it costs you money to do that.

12 Now I'm not suggesting for a moment that there  
13 aren't things that need to be remedied in the process of  
14 preparing for an inspection, but we have to address an awful  
15 lot of new issues as we go about dealing with this  
16 fire-protection process. And it just seems like it's a  
17 never-ending ordeal as we try and come to grips with it.

18 I think the most heartening things about this  
19 whole process this morning is the question that Commissioner  
20 McGaffigan raised when he said what's the most significant  
21 thing that you found in all this process. So with that I'd  
22 turn to David and ask him to --

23 COMMISSIONER MCGAFFIGAN: But before I let him  
24 go --

25 CHAIRMAN JACKSON: I was waiting to see if you

1 were going to --

2 COMMISSIONER McGAFFIGAN: Just on the issue, you  
3 say the insurance industry, you know, monitors this area.  
4 Do insurance rates differ from plant to plant based on  
5 performance indicators the insurance industry uses, or do  
6 they use these core damage -- conditional core damage  
7 frequency numbers for fire that come out of the IPE's? What  
8 is --

9 MR. BEEDLE: They do their inspections and they  
10 find -- they look at the fire-loading issues, whether or not  
11 you're complying with the rules and regulations that you've  
12 set down. And it affects the rates.

13 COMMISSIONER McGAFFIGAN: So rates do vary --

14 MR. BEEDLE: Absolutely.

15 COMMISSIONER McGAFFIGAN: Rates do vary --

16 MR. BEEDLE: That's right.

17 COMMISSIONER McGAFFIGAN: Within the industry.

18 MR. BEEDLE: Right.

19 COMMISSIONER McGAFFIGAN: So a performance  
20 indicator would be what your insurance rate is.

21 MR. BEEDLE: Uhhh --

22 [Laughter.]

23 CHAIRMAN JACKSON: That's good.

24 COMMISSIONER McGAFFIGAN: I mean, I don't know. I  
25 mean --

1 MR. BEEDLE: It's certainly a performance  
2 indicator when I pay the bill. Yes.

3 MR. MODEEN: I think a better indicator might be  
4 what are the findings from your insurance regulator and the  
5 followup activities actually.

6 Let me turn my attention also to NFPA 805. Slide  
7 number 2, please.

8 NEI has been represented specifically on the  
9 committee by two utility fire-protection experts since the  
10 initiation of this project, but clearly it is an NFPA show,  
11 I think, as Tony had indicated, or just part of the process.  
12 We did, however, have -- probably the most significant  
13 meeting so far for the industry was in October of '98 where  
14 the standard, the draft standard had gotten to the point  
15 that we could have a fairly good discussion at the  
16 semiannual fire-protection information forum where we had  
17 over 100 industry peers that are -- and the lead members of  
18 the committee were able to explain the process, the  
19 thoughts, the structure, et cetera, so we could one, start  
20 warming our peers to the idea as well as make them aware  
21 that there was going to be a draft issued the end of  
22 November that they could then comment on, and I think again  
23 as Ed Connell had indicated, those comments or proposals are  
24 due back February 19.

25 NEI will be commenting along with other members of

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1 the public and the committee on that. And we heard quite a  
2 bit of discussion at the meeting. I think that's -- and  
3 I'll come to this later -- as to at least some of our  
4 perspectives on the all-or-nothing and what that might mean  
5 and how the standard might be embraced by the industry.

6 And also related to the question of pilot plants,  
7 though, we don't have plants identified yet, but it's our  
8 intention between the time frame that the next draft is  
9 issued, that is, after these current proposals are dealt  
10 with in February, so that puts us into the late March, early  
11 April time frame. And prior to the publication of what  
12 would really be the ready-to-go standard, I think in the  
13 October '99 time frame, that we'd be able to shake it down a  
14 little bit and actually have some users use it and tell us  
15 how it really works.

16 CHAIRMAN JACKSON: I think it's important if you  
17 really do that that you not only get "good plants" but  
18 plants that have, you know, a history of having had some  
19 issues.

20 MR. MODEEN: Yes, ma'am, I understand.

21 COMMISSIONER McGAFFIGAN: Madam Chairman?

22 CHAIRMAN JACKSON: Please.

23 COMMISSIONER McGAFFIGAN: The other point seems to  
24 be, if I understood the standard from earlier, there are two  
25 options within the standard, one more deterministic and one



1 more performance-based. I don't know whether when you get  
2 the pilot demonstration whether you'd want to pilot both  
3 options, if I'm understanding the standard right. I have  
4 not ever seen the standard.

5 MR. MODEEN: Yes, and in fact I think we may even  
6 cut it a little finer than that, that when finding pilots  
7 and to spend resources on this activity, there has to be an  
8 incentive for that, and my sense is we would be most likely  
9 to find candidates that really want to try to shift more to  
10 this probabilistic risk-informed, use those elements, and  
11 probably the more traditional prescriptive deterministic,  
12 they already know where they sit there.

13 There's not a whole lot of -- my impression  
14 reading the standards, not a whole lot of difference  
15 compared to current practices today and maybe what the  
16 standard might require, I'm not so sure I'm going to find  
17 too many volunteers that really want to work through that  
18 part of it. I mean, that's a difficulty we're wrestling  
19 with, trying to offer incentives there for the licensee.

20 CHAIRMAN JACKSON: Okay.

21 MR. MODEEN: Slide 3, please.

22 Again, my observation, but at a distance, is that  
23 there has been a tremendous amount of activity on this  
24 standard. I think the draft's a good first cut, but it does  
25 need much work. I had heard at the ACRS meeting that up to

1 as many as 51 people had been at a committee meeting at a  
2 time, and only about a third of those really are from the  
3 utility industry. Looking at this thing, I think when you  
4 get a lot of cooks working on that thing, undoubtedly it  
5 needs additional work.

6 CHAIRMAN JACKSON: That's the nature of developing  
7 consensus.

8 MR. MODEEN: Yes. Our view is that we need to see  
9 this through to the end. I know we had gotten some feedback  
10 from the industry and other I'd say doubters and otherwise  
11 as to at least looking at the current standard and the state  
12 that it's in, but it's really our sense is this is the best  
13 avenue in town to really bring in all those stakeholders,  
14 work through the process, do the pilots, and see where that  
15 puts us. I think also we were I guess heartened by the  
16 Commission direction last summer to really pursue this  
17 process as opposed to any other immediate rulemaking on that  
18 activity.

19 At this point I'd like to turn my attention to the  
20 opportunities as well as what the concerns are, and I think  
21 that's related to what in our sense would be impediments to  
22 really having licenses use the standard in the future.

23 Slide 4, please.

24 First of all, the opportunities. Again, yes, this  
25 standard has a little bit of everything in it, whether you

1 want a more deterministic approach or a probabilistic one,  
2 and using performance-based ideas, and the flexibility is  
3 built into the guidelines so that the licensee can try to  
4 take advantage of that.

5 I think it clearly supports the application of  
6 risk-informed insights, which, down the road, I believe will  
7 help us focus NRC and industry resources. I have observed  
8 in my time at the utility, as well as in Washington, that we  
9 continue to work on potential risk significant issues in  
10 fire protection. Some were noted this morning that have  
11 been on the table since the Sandia fire scoping study, and  
12 it provides a framework by which I think the regulator and  
13 the licensee can kind of communicate on where does this fit  
14 relative to my overall fire protection program.

15 Next slide, please. Shifting attention to  
16 concerns, clearly, what we are hearing from our members is  
17 that, obviously, a lot of work, a lot of effort to ensure  
18 that they comply with the current regulations, the licensing  
19 basis they do have, the long litany of changes that may had  
20 occurred there, and exemption processes and relooks and  
21 things like that. So, for those plants, it is relatively  
22 late in a plant life cycle to forego that licensing basis  
23 and adopt the new standard in totality. What does that  
24 really mean? I think that is probably the number one  
25 concern, what would be the expense involved there?

1 I think that leads me to the next point, is that  
2 -- or at least it is our sense that an all or nothing  
3 adoption is really too restrictive and, in fact, there can  
4 be ways to incrementally adopt pieces of the standard where  
5 you see some benefit. I think oftentimes one looks at fire  
6 and fire risk, and we all recognize that inherently -- and  
7 the PRAs tell us this, our own intuition tells us this,  
8 there are pinch-points and areas of concern that one really  
9 needs to pay attention to, and then there are other areas in  
10 the plant that just one exposure fire in and of itself  
11 doesn't make a whole lot of sense to protect to the same  
12 level.

13 CHAIRMAN JACKSON: Well, I mean, presumably, I  
14 mean that is your challenge. I mean I don't view that -- I  
15 wouldn't call that under incrementalism. If you have  
16 appropriately developed a risk-informed standard and an  
17 approach that goes along with that, by definition, that  
18 should cover those issues. If not, then you have failed in  
19 developing a risk-informed approach. I mean that is what I  
20 would say.

21 MR. MODEEN: I see, I understand the point,  
22 Chairman. I would agree with you, and I think, at this  
23 point, perhaps we might be failing because if one looks at  
24 the first -- or Section 3 of the standard, when you define  
25 that minimal fire protection program, many of the elements,

1 I would agree with Ed Connell, belong in a minimum-base  
2 program. I believe there are some elements in there,  
3 however, that if I took a risk-informed approach, I would  
4 not address all those elements to the equal degree in all my  
5 fire areas. And, again, I understand your challenge, that  
6 is back to the Committee and those of us providing comments  
7 into the process.

8 CHAIRMAN JACKSON: That's right. I mean because  
9 -- I mean that, to me, is not something that comes here. It  
10 is something that is back with where you all are in terms of  
11 working through and making the standard really  
12 risk-informed. And if you don't, then there is not a lot  
13 that we can do, if you go through this two year deliberative  
14 consensus development process, and you don't come out.  
15 Because when you talk incrementalism, you have to be careful  
16 with your language, because, in point of fact, -- I will  
17 make two comments to you.

18 One, that sends a message that you want to pick  
19 and choose where, you know, as opposed to having a  
20 comprehensive risk-informed approach. And I think, you  
21 know, a comprehensive risk-informed approach is what you  
22 want, not cherry-picking. And the second comment is that at  
23 an earlier stage, NEI was on the record as being against  
24 incremental improvements to the fire protection rule. I  
25 mean that was -- had come through. You were not in the

1 particular Commission meeting.

2 But I am just -- so, you know, we can say that  
3 incrementalism is okay when we are taking a voluntary  
4 approach, but incrementalism is not okay when we are doing a  
5 rulemaking. But incrementalism, as opposed to a  
6 comprehensive risk-informed approach, is the wrong way to  
7 talk about it.

8 MR. MODEEN: Chairman, I understand the point.

9 CHAIRMAN JACKSON: Yes.

10 MR. MODEEN: Oh, I am trying -- the last point on  
11 slide 5 is that --

12 COMMISSIONER MERRIFIELD: No, no, please finish  
13 your thought.

14 MR. MODEEN: Is that I believe there is a strong  
15 nexus between what we are doing in this area, and also the  
16 industry activities with the Office of Research and NRR in  
17 trying to define what some of that criteria is and to what  
18 level, the degree of rigor. Some of these issues -- I heard  
19 earlier today about IPEEE, and I had significant involvement  
20 in that. I relate back to -- what are the figures of merit?  
21 Where do you stop your analysis? When you are satisfied  
22 with the answer, you are no longer satisfied, or someone  
23 else isn't, so we go analyze some more, and we obviously  
24 need to work through that.

25 CHAIRMAN JACKSON: Well, the question I have,

1 since we still have a year-and-a-half to go on the MPFA  
2 schedule -- NFPA schedule, is that enough time? When you  
3 say time to develop?

4 MR. MODEEN: Yes, I think it is. Yes. We have  
5 had a lot of interactions. In fact, a sideline to this has  
6 been I think a very profitable effort between industry and  
7 NRC responding to the generic request for additional  
8 information on IPEEE fire modeling, on the EPRI fire PRA  
9 model. It probably gave us a jump start on a lot of what  
10 those issues are.

11 CHAIRMAN JACKSON: Okay. Thank you.  
12 Commissioner.

13 COMMISSIONER MERRIFIELD: Mr. Beedle, at the very  
14 beginning of your presentation, you made I think a very  
15 rigorous and fair defense of where NEI and its members are  
16 in terms of the degree of seriousness that they take fire  
17 protection. One of the problems, it seems to me, is  
18 partially an NRC problem, as was described, we have got five  
19 binders, comprising 125 different guidance documents,  
20 overlapping, confusing, and that obviously causes a problem  
21 for licensees, and that is something that we are having to  
22 address and we should address.

23 However, in the earlier presentation, it was also  
24 pointed out that there was one licensee that spent 24,000  
25 man-hours getting ready for the inspection. And so, I am

1 wondering, is that reflective of the NRC problem? Is that  
2 reflective of the licensee not being where they should be  
3 relative to their baseline? Or is it both? And what are  
4 the lessons that we have to learn from that as it relates to  
5 other licensees?

6 MR. BEEDLE: Well, I think it is probably  
7 attributed to both the NRC and the utility. I mean I would  
8 be hard-pressed to tell you that it wasn't. On the part of  
9 the NRC, I think it is a continuing changes in  
10 interpretation of some of the requirements, and as those go  
11 from one plant to the other, every time you have an  
12 inspection, you hire some consultants and they go find out  
13 all the problems in the previous plants. We correct those  
14 in preparation for the inspection this time around.

15 Also, as you go through and you look with fresh  
16 eyes at your program, you might find the need to replace and  
17 remedy some situations that exist in order to make sure that  
18 you do, in fact, meet the standards that are expected today.  
19 So I think it is both.

20 CHAIRMAN JACKSON: Do you feel that this  
21 consolidation of the guidance and eliminating -- you know,  
22 where the guidance conflicts with itself, is a helpful --  
23 will be helpful?

24 MR. BEEDLE: I think eliminating ambiguity is a  
25 good thing in any sector of regulation, including the



1 Appendix R fire protection area. So if we can consolidate  
2 and get clear, concise identifiable requirements, I think  
3 that is both to our advantage, from the utility point of  
4 view, and to the regulator's point of view.

5 CHAIRMAN JACKSON: Okay.

6 MR. MODEEN: If I could also follow up on Ralph's  
7 answer. Relative to the FPGI, I think it is important to  
8 realize that the very first plant that was looked at,  
9 supported by a larger utility with other -- more than one  
10 unit, did no significant preparation for the FPGI. I have  
11 confirmed that with the licensee. And then, of course, this  
12 is a rather significant team inspection, issues get raised.  
13 We were sharing all those issues with the industry, and then  
14 you go, in sequence, to smaller licensees that don't have  
15 the large staffs, can't pull people from other staffs. They  
16 get a little concerned about things, and what is their bases  
17 and stuff.

18 Again, I am not trying to say that there weren't  
19 issues and maybe lose the bubble here or there, but it is  
20 not everyone at 20,000 man-hours.

21 CHAIRMAN JACKSON: No, I think that was clear from  
22 what Mr. West said. He was not implying that it was every  
23 licensee who expended that kind of effort.

24 COMMISSIONER MERRIFIELD: Chairman, just as a  
25 follow up, I mean I guess that raises the question then, we

1 have had a series of these inspections and there were  
2 various responses of the licensees to those.

3 Where are you as an industry now? I mean has  
4 there been some generic follow up across industry? Say,  
5 okay, this is what we have found from these analyses, how  
6 can we apply that industry-wide?

7 MR. MODEEN: Yes. There are several things. One,  
8 both by e-mail and also by semi-annual information forms, we  
9 have been sharing all the insights from these inspections  
10 with all the other plants. We did a survey -- don't hold me  
11 to the date, but about six months ago, wondering if other  
12 people looked and did their own self-assessment as a result  
13 of these things. We had about two-thirds, I think, of the  
14 industry that had already started in various levels. I  
15 think one of the issues on the part of the staff is, you  
16 know, are you as self-critical on yourself as the NRC might  
17 be?

18 The part in the proposal that we put forth to the  
19 staff, and understanding where the inspection and core  
20 baseline program oversight was heading, that it seemed to be  
21 a natural thing to take the FPFIs insights, mesh it also with  
22 the staff role in the licensee rule for self-assessment,  
23 say, hey, this ought to be where the follow-on is across the  
24 board, because, let's face it, four FPFIs a year, you are  
25 not going to get to every plant in twenty-something years,

1 and we will all -- you know, they won't be there. So some  
2 other approach probably makes more sense.

3 CHAIRMAN JACKSON: Okay. Commissioner McGaffigan.

4 COMMISSIONER MCGAFFIGAN: I am going to pile on  
5 the Chairman's question just to try to be clear. The  
6 regulatory acceptance criteria, I assume is our Reg. Guide  
7 for how the new standard would be -- you know, how the staff  
8 would deal with the new standard. Looking back at the  
9 staff's presentation, the comprehensive Reg. Guide that  
10 Commissioner Merrifield just referred to is going to keep  
11 them busy until September getting -- issuing a draft, and  
12 then, presumably, working on the final.

13 When, realistically, could they begin the work of  
14 developing the regulatory acceptance criteria for this  
15 evolving new standard? It sounds like it is needed to  
16 provide some clarity to the industry as to how we would  
17 actually carry out the endorsement. Is it -- I am still in  
18 this technical issue of how much parallelism is possible  
19 here.

20 MR. MODEEN: I believe, and I don't know if the  
21 staff would quite agree with this, but I see the new  
22 standard as very much akin to a new Regulatory Guide, so, in  
23 fact, as you are developing the standard, most of what is  
24 satisfactory in the criteria is in that standard itself.  
25 Okay.

1           The second piece, and what I was referring to in  
2 criteria, is more in agreement along the ways in the  
3 probabilistic models and the figures of merit, and what is  
4 acceptable in that area. It is a little bit different  
5 than --

6           COMMISSIONER McGAFFIGAN: So on this SRE that the  
7 Chairman pointed to earlier, what the acceptable way to  
8 carry -- to do an SRE?

9           MR. MODEEN: Yes. Yes.

10          COMMISSIONER McGAFFIGAN: Will that be in the  
11 Guide or would that be in the acceptance criteria? Or is  
12 that something to be worked out?

13          MR. MODEEN: I don't know that it is totally  
14 worked out there. There is an appendix to the standard that  
15 addresses the use of probabilistic tools and the site-wide  
16 risk evaluation. I don't believe I have seen it yet. I  
17 think it is still being worked. And to some degree that  
18 will have criteria, but I think we were trying to mesh both  
19 criteria, as we understand it, in big picture,  
20 risk-informed, performance-based regulation, the NRC  
21 oversight process, the performance indicators, that type of  
22 criteria -- How does all that fit together? -- which I think  
23 would go beyond where the standard would end up.

24          COMMISSIONER McGAFFIGAN: But do you need that?  
25 If we are going to be endorsing a rule -- the standard by

1 rulemaking, does that have to be part of the published  
2 package, in your view, what you are describing, in order for  
3 people to comment on whether we are on the right track or  
4 not?

5 MR. MODEEN: Yes, I think we would, and I think we  
6 ought to be able to have it there. I don't see a disconnect  
7 timing-wise, or for a way of going on.

8 CHAIRMAN JACKSON: Okay. Mr. McGaffigan -- I mean  
9 Merrifield, please, Commissioner.

10 COMMISSIONER MERRIFIELD: One final question.  
11 Assuming we were to endorse the NFPA standard, how many  
12 plants do you think would come around that direction to want  
13 to participate in that, if we had a two track program? And  
14 layered on top of that, there are some questions -- we have  
15 plants that are coming in for license renewal, and, so, what  
16 would the reaction of the industry be if we said that plants  
17 that are coming in for renewal would have to go that  
18 direction?

19 I mean you raise the question, wanting to have two  
20 track. But you have some plants that are not going to be  
21 going for license renewal, they are only going to be  
22 operating for a while longer and they don't want to switch  
23 over. But what about the plants that are going to renew for  
24 20 years?

25 MR. BEEDLE: The answer is whether or not

1 implementing that new standard would overall reduce the cost  
2 of operating the plant. Is it going to be economics.

3 CHAIRMAN JACKSON: Okay.

4 COMMISSIONER MERRIFIELD: Okay. But the other  
5 part of my question was, how many plants do you think would  
6 go that direction?

7 MR. BEEDLE: It depends on how much money they  
8 have got. It is hard to say, Commissioner. And until you  
9 see it and you do some analysis of it, and determine what it  
10 is going to cost you to implement it, you know, if you can  
11 -- if it is going to cost you \$12 million to implement this  
12 new program, if you are going to operate for three years,  
13 you may not want to do it. If you are going to operate  
14 licensee renewal and operate for an additional 23 years, it  
15 would make a difference in how you approached it.

16 CHAIRMAN JACKSON: Presumably, the pilot, if  
17 well-structured, could help you to address those questions.

18 MR. BEEDLE: It would certainly help us determine  
19 the economics of it.

20 CHAIRMAN JACKSON: Right.

21 MR. MODEEN: I would say, based on a preliminary  
22 look, very reticent acceptance by the licensee.

23 MR. BEEDLE: By the very fact that we are working  
24 on it, there is a presumption that it would cause us to  
25 focus on the things that are more important and, thereby,

1 avoid spending money on things that aren't important and,  
2 therefore, save money overall. So I mean that's --

3 CHAIRMAN JACKSON: That's the risk-informed and  
4 performance-based approach, right?

5 MR. BEEDLE: That's the assumption. Absolutely.

6 CHAIRMAN JACKSON: Okay. I think we --

7 MR. BEEDLE: And maintain safety at the same time.

8 CHAIRMAN JACKSON: Well, risk-informed being  
9 safety is at the heart of it, by definition.

10 MR. BEEDLE: Yes, ma'am.

11 CHAIRMAN JACKSON: Do you have any final comments?  
12 I think we have covered it all.

13 MR. MODEEN: No, I think the last slide is pretty  
14 self-evident.

15 CHAIRMAN JACKSON: Mr. Beedle, did you have any  
16 further comments?

17 MR. BEEDLE: No. Thank you very much.

18 CHAIRMAN JACKSON: Okay. Thank you. We will move  
19 on to the third panel. I would ask Mr. David Lochbaum from  
20 the Union of Concerned Scientists and Mr. Paul Gunter,  
21 Director of the Reactor Watchdog Project at the Nuclear  
22 Information and Resource Service, to please come forward.

23 Thank you. And we'll begin with Mr. Lochbaum.

24 MR. LOCHBAUM: Good morning.

25 CHAIRMAN JACKSON: Good morning.

1 MR. LOCHBAUM: Slide 2, please.

2 If a moving target is difficult to hit, then fire  
3 protection problems must be one of the easiest targets to  
4 hit. The Appendix R regulations went into effect in January  
5 1980, yet the majority of nuclear plants are still not in  
6 compliance with these regulations.

7 COMMISSIONER McGAFFIGAN: Madam Chairman?

8 CHAIRMAN JACKSON: Please.

9 COMMISSIONER McGAFFIGAN: Could I clarify, what do  
10 you mean by not in compliance? They have an exemption?

11 MR. LOCHBAUM: Well, exemption is a form of  
12 compliance, so it's --

13 COMMISSIONER McGAFFIGAN: Yes, I agree.

14 MR. LOCHBAUM: So it's not the exemptions, it's  
15 the fire watches and these surprises that we keep finding.  
16 This industry is too old to be constantly surprised like it  
17 is.

18 COMMISSIONER McGAFFIGAN: Okay. So it's not the  
19 10, 15 exemptions per plant that were granted after Appendix  
20 R went into effect.

21 MR. LOCHBAUM: That wouldn't be the optimum form  
22 of compliance, but that is a form of compliance.

23 COMMISSIONER McGAFFIGAN: So that's not your  
24 concern.

25 MR. LOCHBAUM: That's not our issue, no.



1           If compliance -- we feel if compliance were needed  
2 to generate electricity, we feel confident that the  
3 situation would be very different.

4           To be fair, this regulatory stagnation has been  
5 very helpful to me. Today's presentation is basically the  
6 same one I made to the ACRS Fire Protection Subcommittee in  
7 1997. All I had to do was revise the date and reorder the  
8 slides to make it look like a brand new presentation.  
9 Unfortunately, it looks like I'll be able to recycle this  
10 presentation for many more years.

11           Last week, you proudly informed the United States  
12 Senate that the Calvert Cliffs license renewal process was  
13 ahead of its aggressive schedule and should be completed  
14 during the first half of next year, or 25 months after it  
15 was first submitted.

16           Ironically, the first half of next year also marks  
17 the 25th anniversary of the Browns Ferry fire that prompted  
18 the Appendix R regulations. Perhaps you can understand why  
19 people think that this agency places economic viability of  
20 the industry ahead of health and safety of the American  
21 public when you place design certifications and license  
22 renewals at the top of your priority list and resolution of  
23 fire safety issues on the back burner.

24           Slide 3.

25           On March 22nd, 1975, a worker using a candle to

1 check for air leaks ignited combustible material and a  
2 penetration in a cable spreading room at the Browns Ferry  
3 nuclear plant. Workers responded by trying to extinguish  
4 the fire that they ignited. The fire burned out of control  
5 before anybody reported it to the control room or anyone  
6 else.

7 The local fire department arrived within an hour.  
8 The fire chief advised the plant manager to use water to put  
9 the fire out. The plant manager, concerned that this water  
10 would further damage electrical equipment in the fire area,  
11 refused that suggestion. The fire blazed for over six  
12 hours, disabling most of the emergency core cooling systems  
13 on both of the operating units.

14 When the use of water was finally allowed, the  
15 fire was put out within ten minutes.

16 Slide 4.

17 More than 20 years later, a worker at the  
18 Waterford Nuclear Plant reported heavy smoke in the turbine  
19 building following a turbine trip. The plant's fire alarm  
20 was not sounded for 29 minutes, as workers searched through  
21 the heavy smoke looking for the source of the flames.

22 During this period, fire detector alarms in the  
23 control room were ignored by operators, who were busy  
24 directing fire workers in their search for the flames.

25 When the plant's fire brigade finally responded,

1 the fire brigade leader did not allow water to be used,  
2 again because of the energized electrical equipment. As a  
3 result, the fire blazed for over an hour. When the use of  
4 water was finally allowed, the fire was put out within four  
5 minutes.

6 CHAIRMAN JACKSON: Let me ask you two questions.  
7 I mean, you're aware of the fact that the NRC did put out  
8 after the Browns Ferry fire an information notice that --

9 MR. LOCHBAUM: Yes.

10 CHAIRMAN JACKSON: -- does allow the use of water.

11 MR. LOCHBAUM: Yes, I am. In fact, I worked at  
12 Browns Ferry after the fire, and we were trained to use it.

13 CHAIRMAN JACKSON: Okay. And so this -- so what  
14 I'm interested in understanding is to what extent these as  
15 examples, particularly the later one, relate to what you  
16 feel is a failure in the regulatory framework, a failure in  
17 performance by a licensee, and to what extent they're  
18 connected, if they are. And secondly, I'm interested in the  
19 Waterford fire, what you feel the significance of -- the  
20 safety significance of the event was.

21 MR. LOCHBAUM: Working backwards through those  
22 issues, I think the significance of that issue wasn't too  
23 bad. It was a turbine building, there was no direct threat  
24 to safety equipment based on the location of that fire. It  
25 wasn't a switch-gear area, but the equipment that was

1 actually lost or could have been lost posed no direct threat  
2 to the reactor core or associated cooling.

3           However, the fact that the fire brigade leader,  
4 with the benefit of 20 years of hindsight and this knowledge  
5 that the Browns Ferry should have put out, didn't use the  
6 best thing he had available to put out that fire, which was  
7 water, would have put it out within four minutes, suggests  
8 that if that same fire had been somewhere else that was a  
9 more significant risk, that water still would not have been  
10 used because of the reluctance to use it for causing -- the  
11 reason he didn't use it wasn't because --

12           CHAIRMAN JACKSON: So is the implication of his  
13 behavior, if -- in the -- given the information notice,  
14 given the Browns Ferry experience, the implication of having  
15 the same response as the workers in the Browns Ferry  
16 situation, and they got away with it, you're saying, because  
17 it wasn't in a safety significant area, but if that is  
18 characteristic of the behavior, that's the problem.

19           MR. LOCHBAUM: Right. Exactly. And they didn't  
20 get away with it; the NRC wasn't real happy with what  
21 happened down at Waterford.

22           CHAIRMAN JACKSON: Absolutely. I was going to  
23 point that out next.

24           [Laughter.]

25           MR. LOCHBAUM: Still I think those two events 20

1 years apart, the fact that the -- Browns Ferry, one of the  
2 things we learned was, report the fire to the control room  
3 right away.

4 CHAIRMAN JACKSON: Right.

5 MR. LOCHBAUM: You don't wait to figure out what  
6 it is, how bad it is, whatever; you report it right away.  
7 That didn't happen at Waterford. The second thing was to  
8 put the fire out. Use whatever you have to put it out.  
9 That wasn't done.

10 So there's a lot of lessons that were clearly  
11 learned from Browns Ferry that weren't captured.

12 CHAIRMAN JACKSON: This is 20 years later, one  
13 licensee. I mean, do you have reason to believe that this  
14 is characteristic of the nuclear industry? I mean, it is 20  
15 years later, one licensee.

16 MR. LOCHBAUM: I think I could go through -- I  
17 didn't do that -- I think I could go through and look and  
18 find more than this one example. I don't think this is the  
19 sole example of the time. It just happened to work out good  
20 for the timing --

21 COMMISSIONER MCGAFFIGAN: May I ask, you said NRC  
22 wasn't happy. What is the problem with the regulation? I  
23 mean, you know, --

24 CHAIRMAN JACKSON: Or the regulatory  
25 implementation of the regulation.

1 COMMISSIONER McGAFFIGAN: The regulatory  
2 implementation. The regulatory implementation by the  
3 licensee I understand, but what is it that NRC could have  
4 done to make sure that that person had learned a lesson of  
5 20 years ago? Isn't it the licensee's responsibility to  
6 make sure that their control room follow presumably their  
7 procedures that said to do exactly what you said to do?  
8 What is it that we would have done differently?

9 MR. LOCHBAUM: I think some things you did do that  
10 I thought were good, was after the Waterford fire, you  
11 clearly indicated that this was unacceptable performance, so  
12 that sends a message to everybody else: try not to do this  
13 again.

14 But I think when -- you can't wait for a fire all  
15 the time to learn these things. They are very expensive and  
16 they can be very costly.

17 COMMISSIONER McGAFFIGAN: But how do you not learn  
18 them? If the problem is a response to a fire, how do you  
19 learn -- I guess we could give everybody a test, you know.  
20 Maybe -- I don't know whether there are testing requirements  
21 and whatever that you feel are inadequate. But I'm trying to  
22 figure out what is the regulatory thing that the NRC could  
23 have done to prevent the second fire?

24 MR. LOCHBAUM: Well, you couldn't prevent the  
25 second fire -- prevent the performance problems in the

1 second fire.

2 COMMISSIONER McGAFFIGAN: Right. Right.

3 MR. LOCHBAUM: You can't just be in a fire  
4 brigade. There is training and qualifications to do that.  
5 In the inspections conducted by the NRC to look at the  
6 licensee's fire brigade training and qualifications issues,  
7 the reluctance -- or the knowledge of the most significant  
8 fire in the industry should be a part of what the NRC does  
9 to look at the licensee program.

10 If, you know, it's not stressed both to the fire  
11 brigade and to other workers at the plant, because at Browns  
12 Ferry we were taught if we got hurt at the plant to yell  
13 fire because that got people there real quick because  
14 everybody was so trained to respond. So you've got to look  
15 at those kind of things.

16 COMMISSIONER McGAFFIGAN: In our inspection module  
17 for the core inspection program, this revised core  
18 inspection program, you're suggesting that our residents  
19 look for this exact -- look at how the fire brigade training  
20 is carried out and whether people have knowledge of now two  
21 events, Waterford and Browns Ferry?

22 CHAIRMAN JACKSON: Let me piggyback onto that  
23 because I --

24 COMMISSIONER McGAFFIGAN: I just want to  
25 understand.

1 CHAIRMAN JACKSON: -- noted that you have as your  
2 third bullet on the Waterford fire that the fire detector  
3 alarms in the control room were ignored by the operators,  
4 who were directing the search for the flames, and therefore  
5 the fire was out of control before a fire alarm was sounded.  
6 The question becomes, I mean in addition to what  
7 Commissioner McGaffigan has raised, is it a training issue,  
8 you know, or something in the simulator with a crew? That's  
9 the kind of thing we need to understand. Is it something  
10 that can be accounted for in an inspection program? Is it  
11 something that's a training issue that we need to adjust?  
12 Is it something in the regulations or in some guidance we  
13 put out?

14 MR. LOCHBAUM: Well, I think it harkens back to  
15 some of the questions asked of the previous panels, the  
16 sensitivity or awareness of the industry to these problems.  
17 I think this demonstrates that awareness or emphasis in this  
18 area, at least at Waterford, was dropping off and people  
19 weren't responding.

20 As far as the bullet that you mentioned, what  
21 concerned me -- us about that issue is the control room  
22 operators -- those alarms that were going off in the control  
23 room told the operators where the fire was. That's why they  
24 put them in. Instead of looking at that and finding out  
25 where the fire was, he sent three more people into heavy



1 smoke to look for the flames, ignoring information available  
2 to him in the control room that told him where they were.  
3 So he was jeopardizing those people and slowing down the  
4 response overall.

5 To me, that was the lesson of TMI. You had the  
6 back-up information; it was not used for a while. So again,  
7 it's a training awareness issue.

8 CHAIRMAN JACKSON: Okay.

9 Mr. West, you were going to make a comment?

10 MR. WEST: If you'd like, I could provide a little  
11 insight into the specifics or the event. I went to  
12 Waterford after their fire and helped supervise the NRC  
13 inspection team, and the real problem at Waterford was a  
14 problem with their procedure for fire notification. The  
15 licensee had had a problem with false alarms, false fire  
16 alarms based on operators or other plant personnel observing  
17 smoke and sounding the fire alarm, which would dispatch the  
18 entire fire brigade.

19 They addressed that problem by revising their  
20 procedure to say, don't sound the fire alarm unless you  
21 actually see flames. You have to see flame, it can't be a  
22 smoking motor. So they had an inadequate procedure, which  
23 we -- and they had inadequate fire brigade training because  
24 they did not use water on the fire. We took appropriate  
25 enforcement action and the licensee has corrected those

1 problems.

2 We have factored, of course, the lessons learned  
3 from that event into our inspection program -- specifically  
4 the FPGI -- and we have looked at those issues during FPGI  
5 inspections, and we think it's a -- I don't know if it's an  
6 anomaly but it's a unique case.

7 AEOD did do a study which they completed in 1997  
8 of all fire experience in commercial U.S. reactors, and they  
9 looked at the fire experience from -- I believe it was 1965  
10 through 1994, and there are some rare cases like this, but  
11 it's not common. In most cases, the fire brigades and the  
12 plant operators take appropriate action. There have never  
13 been any deaths or injuries as a result of fire in a nuclear  
14 power plant.

15 CHAIRMAN JACKSON: Well, that one you could --  
16 that one is less of -- that doesn't give me comfort. All  
17 you need is one. But you're saying that there was some  
18 fallout for us in terms of normalization vis-a-vis  
19 inspection against procedures in this area.

20 MR. WEST: Yes, ma'am.

21 CHAIRMAN JACKSON: And the second having to do  
22 with training vis-a-vis the fire brigade.

23 MR. WEST: Yes, ma'am. The fire brigade should  
24 all be trained, classroom training and practical training in  
25 using water on fires.

1 COMMISSIONER McGAFFIGAN: Madam Chair?

2 MR. WEST: It's specific in the regulation.

3 COMMISSIONER McGAFFIGAN: Before we let him go,  
4 how -- I mean, the root cause, a root cause was they had the  
5 false alarm issue, which they dealt with in an inappropriate  
6 way. How common are false alarms in the industry? Do you  
7 know at a given plant how many false alarms are there per  
8 year or per month? Do you know?

9 MR. WEST: I couldn't say off the top of my head.  
10 I know they occur. I'm sure we don't even have data on  
11 that. The false alarms can occur in any --

12 COMMISSIONER McGAFFIGAN: I'm just trying to  
13 understand whether there's a big generic -- I mean, a lot of  
14 folks were facing this, and maybe a lot of folks developed  
15 inappropriate procedures to deal with false alarms.

16 MR. WEST: We don't believe so.

17 COMMISSIONER McGAFFIGAN: Okay.

18 MR. TRAVERS: Just a clarification. I don't  
19 believe that this is as much the false alarms at it is  
20 over-conservatism in response --

21 CHAIRMAN JACKSON: To an alarm.

22 MR. TRAVERS: -- to a perceived fire where you may  
23 or may not have an alarm.

24 COMMISSIONER McGAFFIGAN: Right. Well, Mr. West  
25 said that they had developed a procedure because they had

1 had lots of false alarms, and the procedure said see the  
2 fire, and I was just trying to understand whether false  
3 alarms were a general issue.

4 MR. WEST: Could I clarify that just a little bit?  
5 If I said false alarm, I didn't mean a situation where the  
6 detection system alarms falsely; I meant a situation where a  
7 plant operator or some other plant person would sound an  
8 alarm that would dispatch the fire brigade when, in fact,  
9 there was not a fire. They may see smoke, a smoking motor  
10 or some other condition where you would not need the full  
11 fire brigade, but by sounding that alarm, the procedure  
12 required the licensee to dispatch the fire brigade.

13 CHAIRMAN JACKSON: Thank you.

14 MR. LOCHBAUM: Slide 5, please.

15 Another Browns Ferry lesson that seems to have  
16 fallen by the wayside is the need for noncombustible  
17 fire-barrier penetration seals. In an October 16, 1980  
18 meeting, the Commission explicitly refused the industry's  
19 position that penetration seals only need to have the same  
20 fire rating as the wall, floor, or ceiling that they are  
21 sealing.

22 The Commission pointed out that the penetration  
23 seals are more likely to be challenged during a fire because  
24 combustible material, i.e., the cable insulation, will bring  
25 the flames to the fire-penetration seals, whereas the walls,

1 floors, and ceilings may or may not be exposed to direct  
2 flames. The Commission therefore concluded that the  
3 fire-barrier penetration seals needed to be noncombustible.  
4 The staff's current position on penetration seals is in  
5 direct opposition to the position taken by the Commission in  
6 1980 and as promulgated in the Appendix R regulations and  
7 associated guidance documentation.

8           However, having said that, we don't care if people  
9 use kerosene in those penetration seals, as long as they  
10 pass the fire test. The problem we have and that we  
11 constantly find out is that these things are installed  
12 without tests or documentation to support them. Maine  
13 Yankee had one test that backed up 90 percent of their  
14 seals, and it didn't bound hardly any of those  
15 installations. At Salem that FS-195 product is hard to tell  
16 what the test is because there's no dimensions given on the  
17 drawing. So we don't know if it bounds one or none or all.  
18 So that's why that licensee is now doing some tests, because  
19 the documentation doesn't give you that answer.

20           CHAIRMAN JACKSON: So let me make sure I  
21 understand. So the issue is really not the combustibility  
22 versus not combustibility, it's the actual performance  
23 verification against the performance, the requirement or  
24 the, you know, and one aspect of that is installation with  
25 the appropriate testing and documentation. Is that right?

1 MR. LOCHBAUM: Right. The staff in responding to  
2 us and to Representative Markey says things like, you know,  
3 if properly designed and installed fire barrier provides  
4 adequate protection. And we would -- if that's the  
5 condition we were at, we probably wouldn't be here today.  
6 We don't have properly designed and installed fire barriers  
7 or assurance of that.

8 CHAIRMAN JACKSON: Right.

9 MR. LOCHBAUM: That's the issue. Like I said,  
10 they could be kerosene as long as they meet the one- or  
11 three-hour test. I doubt that they would, if they were  
12 kerosene, but -- Slide 7?

13 We recognize that things change, and the position  
14 taken in 1980 may not be valid today. We fully recognize  
15 that. But we feel that the staff is corrupting the  
16 regulatory process by essentially ignoring the portions of  
17 fire-protection regulations that they unilaterally feel are  
18 meaningless. The proper and legal course of action would be  
19 for the staff to change the regulations to whatever it is  
20 they feel is right. Until that time, the staff should  
21 enforce the regulations that are on the books, even those  
22 that they don't care for.

23 COMMISSIONER MCGAFFIGAN: Madam Chairman, I think  
24 that's exactly what we're going to do. This rulemaking  
25 package is going to be out for comment on combustible versus

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1 noncombustible, but, you know, one of the fundamental  
2 problems with Appendix R, and I went and read a court case  
3 in which a liberal group of judges on the U.S. appeals court  
4 panel, a panel of judges on the U.S. appeals court, you  
5 know, listened to a challenge to Appendix R and ruled in  
6 March of 1982, and I wish I had it in front of me, but they  
7 basically only supported the rule because in trying to  
8 defend ourselves at that time the Commission said we're  
9 going to use exemptions, we're going to use exemptions.  
10 And --

11 MR. LOCHBAUM: And you did.

12 COMMISSIONER McGAFFIGAN: And we did. We did.  
13 But otherwise the court probably would have tossed the rule  
14 out, because as I understand Appendix R the way it was put  
15 together, I mean, the complaint that was made was we  
16 basically stapled together every best practice that anybody  
17 brought forward and said okay, here's our rule, but here's  
18 our exemption process. And come one, come all, to use our  
19 exemption process, because we realize stapling together all  
20 of these -- it's exactly how you don't do rulemaking, I  
21 would posit.

22 So now the piece of the rule that -- I think we've  
23 almost exempted everybody from the combustible versus  
24 noncombustible over the years. So now we're going to bring  
25 that into fact. But we are going to do it by rulemaking,

1 and we are going to justify it as we've already done in the  
2 correspondence with Senator Biden and Representative Markey  
3 that you're citing, and we'll see how the discussion goes.

4 But the frustration I have with this whole area is  
5 there was a really flawed rulemaking; the reason you can  
6 shoot at this target so easily is the Appendix R rule is  
7 probably the epitome of how not to rulemake. If you do a  
8 rule and say, you know, with a big sign saying, "See our  
9 exemption process" --

10 CHAIRMAN JACKSON: Right. Go this way.

11 COMMISSIONER McGAFFIGAN: This way to the  
12 exemptions. It's a hell of a rule.

13 MR. LOCHBAUM: What position are we in today  
14 though with adopting an NFPA standard that perhaps nobody  
15 will embrace? You know, it will be an awful --

16 COMMISSIONER McGAFFIGAN: I think that's a fair  
17 issue too.

18 MR. LOCHBAUM: So whether you point to exemptions  
19 or point to a standard that nobody follows, that's semantics  
20 largely. So we're concerned that we can go through this  
21 rule and develop a new standard, but nobody will follow it.

22 Slide 8, very briefly. Last month at a Commission  
23 meeting I told you that plant risk assessments are  
24 nonconservative because they unrealistically assume that  
25 fire barriers are 100-percent effective. Regarding the



1 information that was discussed earlier from the earlier  
2 panel, the Quad Cities situation, with the  
3 two-orders-of-magnitude pencil whipping that was done, the  
4 point I tried to make at last month's meeting was that if I  
5 was going to make a change to my plant to put kerosene in  
6 the fire spray headers, that it would increase the risk by  
7 two orders of magnitude.

8 I could pencil whip it, because this can be done,  
9 and it would show that my balance was net zero, and that  
10 would allow me to do that. That would be one of the dumbest  
11 things I've done, but technically I could do it. There's no  
12 provision against it, other than common sense. But the fact  
13 that you can do this allows those kind of abuses to occur,  
14 and we're very concerned about those kind of abuses. Not  
15 that people will be using kerosene.

16 CHAIRMAN JACKSON: Let me ask you this question.  
17 Would the development of the PRA standard help to address  
18 this issue?

19 MR. LOCHBAUM: Definitely. I was encouraged by  
20 Mr. Rubin's comments about standardization and things like  
21 that. We would advocate that needs to be done before we  
22 really proceed much further towards risk-informed  
23 regulation.

24 Slide 9. There's been a lot of talk about  
25 focusing both industry and NRC efforts on the right areas.

1 I would argue that that can't be done until plant risk  
2 assessments accurately account for fire-barrier problems.  
3 For example, in plants that have 10,000 penetration seals,  
4 if it took one hour to inspect the penetration seals, then  
5 it would take five man-years to examine all 10,000.

6 If you had a realistic PRA that accounted for  
7 possible nonperforming or nonfunctional fire barriers, then  
8 you could use the results from those realistic risk  
9 assessments and expend 100 inspection hours and cover the  
10 100 highest-ranked penetration seals, which would probably  
11 comprise the bulk of the fire-risk profile. So on one hand  
12 the industry is arguing about risk-informed regulation and  
13 focusing the priorities in the right area, and this is an  
14 area that they definitely could do that.

15 CHAIRMAN JACKSON: Let me ask you a question,  
16 because this is an interesting area for me. Are you  
17 implying that the PRA's have to be able to deal with  
18 degraded performance?

19 MR. LOCHBAUM: I think the record shows that there  
20 is degraded performance. Penetration seals are typically  
21 nine inches for fires and walls. If you only have seven  
22 inches of foam due to some installation error, then that  
23 affords you less than the three- or one-hour rating,  
24 whatever it's designed for. PRA would account for those  
25 kind of things on a statistical basis and would say where if

1 you only have an hour's worth of combustibles in a region,  
2 then that might exclude some areas from concern.

3 But that kind of information would tell you based  
4 on the evidence that's out there where your weak spots are,  
5 and that's where you would focus -- both yours and the  
6 industry -- would focus their resources, inspection  
7 resources.

8 CHAIRMAN JACKSON: Okay.

9 MR. LOCHBAUM: Slide 10. In summary, we feel that  
10 Browns Ferry's lessons have not been fully captured by the  
11 industry or the staff. We feel that plant risk assessments  
12 are invalid because they do not reflect reality. If this  
13 problem were fixed, the plant risk assessment results would  
14 allow properly focused safety inspections.

15 This Friday is Abraham Lincoln's birthday. If  
16 Lincoln were alive today and working for the NRC, perhaps  
17 not so far-fetched that the rail-splitter might become an  
18 atom-splitter, he might say we can enforce some of the  
19 regulations all the time, all of the regulations some of the  
20 time, but we cannot enforce all the regulations all the  
21 time. I would agree with Abe, even if he wasn't carrying  
22 that ax of his. All we are asking for is for the NRC to  
23 enforce the fire-protection regulations now.

24 Thank you.

25 CHAIRMAN JACKSON: Thank you, David. A historical

1 perspective is always instructive.

2 [Laughter.]

3 MR. LOCHBAUM: It gets easy with this issue.

4 CHAIRMAN JACKSON: Mr. Gunter.

5 MR. GUNTER: Thank you.

6 My name is Paul Gunter. I'm director of the  
7 Reactor Watchdog Project with Nuclear Information Resource  
8 Service. I'm going to go through these slides very quickly  
9 here in order to proceed. But I would like to say that I  
10 was involved in the petition writing on the Thermo-Lag issue  
11 back in 1991 and '92, and it's from my perspective and  
12 organization's perspective that we recognize that the  
13 resolution of this issue still lags.

14 Just go to slide 3.

15 I think that we can quickly recognize, and I'm  
16 sure we're all aware of how Thermo-Lag has demonstrated  
17 failure. The Office of the Inspector General reported as  
18 early as 1982 NRC had a warning that Thermo-Lag didn't work.  
19 These were the fire tests over at Susquehanna, I believe.  
20 Yet a replication of those fire tests was used to qualify  
21 the barriers at other nuclear power stations.

22 It was a safety-conscious fire protection  
23 consultant frustrated by the lack of NRC enforcement who  
24 reported his concerns to the NIRS in 1991 that began to put  
25 some public profile on this issue.

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1           Finally, on June 24 Information Bulletin 92-01  
2 came out declaring Thermo-Lag barriers inoperable. NIRS  
3 filed its 2.206 petition shortly thereafter, which was  
4 rejected by NRC on August 12, 1992. I would point out that  
5 six years later one of our contentions in that 2.206  
6 petition with regard to new information on seismic  
7 qualification of Thermo-Lag that it could actually shear  
8 fall off and break or damage cables was in fact a bona fide  
9 issue in an information notice in '98. But by the end of  
10 1993 in this chronology the nuclear industry through the  
11 guidance of NUMARC sets up a special task force as we see to  
12 scrimmage with NRC over this very expensive item, and they  
13 establish it as a priority item to reestablish the technical  
14 and licensing basis to qualify Thermo-Lag material for use  
15 in one- to three-hour barriers as required by Appendix R.

16           There's a long gap here of where we attended a lot  
17 of meetings, a lot of staff time involved, a lot of  
18 information notices, but from our perspective essentially  
19 the industry was successful in dragging out a resolution to  
20 1997 when we finally began to see confirmatory action orders  
21 issued during 1998 to noncompliant utilities, most of whom  
22 are the licensees with extensive applications of the  
23 material. We've seen to date some resolution in minor or,  
24 you know, the moderate users of the material, but still the  
25 outliers here are those who are extensively reliant upon

1 Thermo-Lag.

2 It's our concern and our frustration that rather  
3 than move towards enforcement of a prescriptive regulation  
4 which these fire barriers were intended to represent, we now  
5 see the potential for another extensive delay as NRC and  
6 industry begin to approach another layer of regulation, but  
7 not to take the Thermo-Lag issue out of isolation, but the  
8 same kind of problem that's involved with Thermo-Lag we see  
9 reoccurring in the Salem nuclear power station with regard  
10 to the FS-195 barrier, the E-50 inner ram barrier, and the  
11 Kale-Wool barrier.

12 Again here's a chronology that basically goes  
13 through an identification of the problem. In 1992 we  
14 proceed through a 2-1/2 to 3-year outage for Salem unit 3  
15 and -- yes, Salem unit 2 -- and still the issue's not really  
16 addressed as a restart issue where these inoperable fire  
17 barriers are still in place. This was also identified in a  
18 NUMARC industrywide workshop. So it's not that the industry  
19 didn't know about these III.M barriers and the problems  
20 associated with it.

21 CHAIRMAN JACKSON: Let me ask you a question. To  
22 what extent do you feel that a let's say for the lack of  
23 other terminology a fire-protection defense-in-depth  
24 approach should play a role, where you have this combination  
25 of fire prevention, detection, and suppression along with a

1 safe-shutdown capability, that it's really the balancing of  
2 those in the face of any one given issue which may include  
3 degraded barriers? I mean, to what extent is that kind of  
4 approach valid? I mean --

5 MR. GUNTER: We believe that to be a valid  
6 approach. And frankly I believe that that's why the  
7 noncombustibility factor is in the penetration seal  
8 regulation, that in fact we know the derated barriers are  
9 out there in the industry. They are turning them up all the  
10 time. That's why we believe that it's appropriate to leave  
11 the noncombustible standard in there as an element of this  
12 defense in depth, that you don't have the barrier itself  
13 lending as a fuel to a fire.

14 CHAIRMAN JACKSON: Well, I mean, is it true that  
15 all -- so your assertion is that all combustible barriers  
16 are fuel -- add fuel to the fire. Is that your point?

17 MR. GUNTER: I can understand that, for example,  
18 Mr. Connell's earlier example of this wooden door over here  
19 being involved as a rated barrier for this room or to  
20 protect this room, whichever side the fire's coming out.  
21 But when inspection procedures find that the wooden door  
22 itself is hollow in many cases or cracked or has gaps, and  
23 that the current inspection procedures for determining  
24 whether or not that barrier's degraded is extremely  
25 difficult with -- there's really no nondestructive analysis

1 available is my understanding -- to actually determine if  
2 these penetration seals have voids and cracks, because  
3 they're largely hidden. That's why I believe that you have  
4 that noncombustible standard in that penetration seal as an  
5 element of this defense in depth.

6 CHAIRMAN JACKSON: Okay. Proceed.

7 MR. GUNTER: But just to pick up the chronology  
8 again, September 23, 1998, we finally see -- the public, at  
9 least, finally sees that the Salem Nuclear Power Plant  
10 Stations's fire project plans for compliance by 2002. Now,  
11 this can only reflect to us a lack of resolve, both on the  
12 industry's part and on the regulatory agency's part, to  
13 actually bring plants into compliance and to enforce  
14 regulations. It also constitutes an example of where NRC  
15 all too often has simply accepted without verification and  
16 validation the licensee's representation, and which turns  
17 out not to be the case.

18 I think it is quite obvious that the industry, as  
19 identified, puts economics as one of the principal issues in  
20 determining resolution, and that the scrimmage in coming to  
21 some kind of meaningful mitigation of this issue is based  
22 largely on economics, from our perception. And now we are  
23 involved in this rewrite, another avenue of regulation,  
24 which we believe is actually sidestepping a key and a  
25 problematic regulatory requirement for tested, rated



1 barriers which could be part of a prescriptive regulation  
2 for this particular problem.

3 So I think that what that really brings us to is  
4 there is no real resolution in sight from a public health  
5 and safety concern. We are -- what we see is an industry  
6 inching towards a goal line of closing some of these plants  
7 down rather than addressing -- you know, running them to  
8 their operational life without really addressing the fire  
9 safety issues, basically, because the economics is a  
10 hindrance to bringing some resolution and compliance to the  
11 issue.

12 We believe that that strategy is at much higher  
13 risk because as we move down the line, these plants are  
14 getting older and age-related degradation is more and more  
15 of a factor, and cost-cutting incentives only grow larger as  
16 plants move towards the end of their life.

17 CHAIRMAN JACKSON: Do you believe that there can  
18 be an appropriate risk-informing of fire protection  
19 regulations?

20 MR. GUNTER: I think it is going to be difficult.  
21 I think that there has to be -- it is like approaching  
22 traffic regulation through risk-informed, performance-based.  
23 There have to be stop signs. And there has to be  
24 enforcement.

25 CHAIRMAN JACKSON: But there aren't stop signs at

1 every corner.

2 MR. GUNTER: There don't necessarily have to be  
3 stop signs at every corner, but there are appropriate times  
4 to have police enforcing speed limit, and red lights. And  
5 if you run a red light, you get ticketed. So, I think my  
6 concern, as we move down this avenue of risk-informed,  
7 performance-based regulation, that there will be more  
8 arguing when they are pulled over to the side, in terms of,  
9 you know, violations, and that is -- I don't believe that  
10 that is done at the behest of optimal public health and  
11 safety. But it is concern, again, that it is an economic  
12 issue that prioritizes the approach.

13 Reliance on indefinite and unreliable fire  
14 watches. First of all, we believe that there is an  
15 appropriate time and place for fire watch. These are  
16 temporary circumstances, of course. But, as we see, the  
17 current use of fire watch as a compensatory measure for  
18 long-term inoperable fire barriers, this is an obvious abuse  
19 from our concern and perspective.

20 I think that Commissioner Ivan Sellin also pointed  
21 this out in a statement made in testimony before the  
22 Subcommittee -- or the House Subcommittee on Oversight and  
23 Investigations. I think that it is really evident here that  
24 even then NRC saw six to nine months as an optimal time, and  
25 that when you start running into fire watches over a two

1 years timeframe, you are running into real problems, not  
2 only in terms of expense, but in terms of surveillance  
3 problems.

4 Thermo-lag fire watches have now been in place for  
5 78 months at plants where there are extensive applications  
6 of thermo-lag. At least two reactor sites will probably  
7 close with thermo-lag fire watches in place. Again, this is  
8 this whole strategy that we see of inching towards a goal  
9 line without really remediating the problem.

10 CHAIRMAN JACKSON: Which plants are those?

11 MR. GUNTER: That would be -- well, certainly,  
12 Oyster Creek, by confirmatory order, and their response  
13 back, they are looking at 2000. I think it pretty well  
14 known that they intend to close before 2000. The other  
15 plant that we are suspecting would be Clinton.

16 The issue here, though, is that fire watches do  
17 not constitute a compensatory level of protection for a  
18 rated, passive fire barrier system. Obviously, a fire  
19 barrier is what it states, it is a physical barrier used to  
20 protect safe shutdown cables from fire for up to three hours  
21 in the event that you can't get a fire brigade to put out  
22 that fire, and that can occur either by heat or by radiation  
23 in the case of nuclear power stations.

24 Obviously, that level of compensatory action  
25 cannot be taken by a fire watch. As a matter of fact, most

1 fire watches don't even carry suppressions systems with  
2 them. \*They are a more appropriate measure for a detection  
3 system, for compensating lack of detection, from our  
4 perspective. But what is most troubling is to see, time and  
5 time and time again, where fire watches have been noted for  
6 dereliction of duty. And there is a whole range of problems  
7 here, not only just that they get caught in an elevator and  
8 can't get to watch, but that in the case of Turkey Point,  
9 the thermo-lag fire watch was found overdosed on heroin.

10 So, and then there --

11 CHAIRMAN JACKSON: Where was this?

12 MR. GUNTER: Turkey Point. That was through a  
13 -- there is a P&O on that was quite interesting to read.  
14 But then, again, we also see the falsification of duty logs  
15 as a problem and it broadens this range of uncertainty, just  
16 exactly how much of a measure of protection we have with  
17 fire watches even in place.

18 So, in closing, I think that it is appropriate to  
19 look to a recent Washington Post article dated November 8th,  
20 1998, where the FAA missed a warning on insulation burn  
21 tests regarding the September 2nd crash of Swiss Air Flight  
22 111, which involved combustible insulation. We view this as  
23 a case study of a critical safety issue being buried within  
24 a government institution subject to tight budgets and a  
25 single event.

1           The public wouldn't tolerate fire watches for --  
2 on-board fire watches in its airline industry. And there is  
3 significantly much more riding on nuclear power stations  
4 operating without operable fire barrier systems and without  
5 timely regulatory resolution enforcement. And why should  
6 the public be any more tolerant of the nuclear power  
7 industry and the Nuclear Regulatory Commission?

8           CHAIRMAN JACKSON: Thank you. Commissioner Dicus,  
9 any questions? Commissioner Diaz, do you have a question or  
10 comment to make? Yes, this is the end of the line, so if  
11 you are going to make a comment, make the comment.

12           COMMISSIONER DIAZ: This is the end of the line.  
13 Okay. Since I have been so quiet, you might indulge me with  
14 an integral response in here. I think this issue, which I  
15 have been facing since I got to the Commission and before,  
16 as everybody is saying, it requires an integral solution.

17           But it just reminds me, you know, of a story and  
18 the ending of the line, a story probably everybody knows is  
19 this city council meeting in which people were discussing  
20 what to do about dogs that have rabies and how to take care  
21 of the problem. And the mayor just feel asleep in the  
22 middle of that meeting. And then the subject changed to how  
23 they were going to take care of this epidemic of measles in  
24 the schools, and how they are going to try to prevent the  
25 measles and how they are going to help the kids and so

1 forth. And then the mayor just woke up in the middle of  
2 that discussion, and they asked him, mayor, what do you  
3 think? And he said, shoot them all. I mean shoot them all.  
4 Track them and shoot them all.

5 And then the gentleman came and said, but, Mr.  
6 Mayor, we are talking about curing them, not shooting them.  
7 He said, cure them or shoot them, but solve the problem.

8 I think that in this case, we have been arguing  
9 for this for so long that it is a matter of shoot or cure  
10 them. And it is obviously that the industry and the NRC put  
11 such enormous resources for so long, patching these type of  
12 things, that it is time that we look at realistic solutions.

13 Now, I am not an expert on fire protection. I  
14 really don't know what to do with many of the things. We  
15 need to trust, you know, in the staff and the industry. But  
16 it is time that we realize we cannot continue to look at  
17 this problem time after time, day after day, and not get a  
18 solution. Now, the solution might very well be different.  
19 There are people that will be able to do risk-informed  
20 regulations and tackle the ones that really need to ensure  
21 that the problem is solved with some more deterministic way.  
22 But whatever it is, let's shoot them or cure them, but let's  
23 finish with the problem.

24 CHAIRMAN JACKSON: Thank you. Commissioner  
25 McGaffigan.

1 COMMISSIONER McGAFFIGAN: One question I had that  
2 came up with the previous panel, do either of you intend to  
3 play in this NFPA standard drawing-up process, either as  
4 members of the Committee or as commenters on the rule -- or  
5 the standard as it comes out?

6 MR. GUNTER: NIRS has the document under review at  
7 this point.

8 COMMISSIONER McGAFFIGAN: Okay. But you didn't  
9 ask to be part of the Committee itself?

10 MR. GUNTER: Not at this point.

11 COMMISSIONER McGAFFIGAN: Okay.

12 MR. LOCHBAUM: NIRS has the lead on this issue,  
13 and I support Paul as he needs help but he hasn't for it  
14 yet.

15 COMMISSIONER McGAFFIGAN: Okay. And the second  
16 question I have, I heard Oyster Creek earlier, and I  
17 remember I happened to have the CEO of GPU in to see me  
18 about the time that one of Mr. Lochbaum's reports came out  
19 that gave him a sort of UCS Good Housekeeping Seal of  
20 Approval, in some sense, I mean he said it was a pretty good  
21 plant. How do you balance, when you make that sort of  
22 assessment, fire versus everything else that GPU does at  
23 Oyster Creek that went into your overall conclusion that  
24 they were among the UCS good plants?

25 MR. LOCHBAUM: It is a good question. I think

1 -- but the other 10 plants we had also had fire protection  
2 problems. So, on a relative basis, and ours was a relative  
3 basis, they looked the least evil perhaps. But a more  
4 correct answer is that -- the thing, the most striking  
5 performance aspect that Oyster Creek had was a good  
6 percentage of their problems were identified by looking at  
7 other people's -- other plants' problems, and looking at  
8 their own plant to see if they had the same thing, rather  
9 than waiting for the NRC to find it, or waiting for it to be  
10 self-revealing. We gave a lot of credit for that, because  
11 that is very commendable. That is more than they have to  
12 do. And those -- there was enough of those ones, they kind  
13 of brought their score up, I think second overall.

14 And we, although we disappointed some of the  
15 groups we worked with that were -- not NIRS, you just  
16 happened to be happened to be sitting over there.

17 COMMISSIONER McGAFFIGAN: Right.

18 MR. LOCHBAUM: But some of local groups were upset  
19 with our ranking, but we couldn't adjust the data, and that  
20 is what the data showed.

21 COMMISSIONER McGAFFIGAN: Okay. Thank you.

22 CHAIRMAN JACKSON: Okay. Commissioner Merrifield.

23 COMMISSIONER MERRIFIELD: I don't know if I would  
24 agree with the analogy of shoot it or cure it, but I  
25 certainly would agree with Commissioner Diaz that this is



1 one that we need to put the attention to and get it solved,  
2 because keeping it lingering longer is not helping anyone.

3 CHAIRMAN JACKSON: Well, that was what we thought  
4 we were doing in the fall of '96, and the Commission  
5 switched directions in the spring of '98. But, nonetheless,  
6 I feel that today's discussions have been beneficial in  
7 focusing the Commission in those areas where we do need to  
8 resolve and to finalize these going fire protection issues.  
9 And as I stated at the recent Congressional hearing on NRC  
10 oversight, fire protection issues remain a challenge, I mean  
11 we are being honest, for the NRC to resolve. This is  
12 especially significant given the risk significance of fires  
13 at nuclear plants.

14 And so I want to thank all of the participants for  
15 their input and insight and we are going to encourage the  
16 staff, of course, to continue their interaction with the  
17 stakeholders in developing timely and effective  
18 risk-informed solutions to these problems.

19 Nonetheless, I take heed of the admonition that a  
20 changing regulatory framework is no excuse for our not  
21 effectively and appropriately implementing existing  
22 regulatory requirements.

23 So, unless there are any other further comments,  
24 we are adjourned. Thank you.

25 [Whereupon, at 12:15 p.m., the briefing was

1 concluded.]

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# **FIRE PROTECTION ISSUES**

**February 9, 1999**

**Brian Sheron - NRR**

**Ed Connell - NRR**

**Steve West - NRR**

**Alan Rubin - RES**

**Steve Reynolds - RIII**

# **OVERVIEW**

- **Revise Appendix R & 10 CFR 50.48**
  - Remove noncombustible requirement for penetration seals
  - Remove implementation schedule & footnote to guidance documents
  - Schedule on track to be completed April 2000
- **Comprehensive Fire Protection Regulatory Guide**
  - Consolidate & improve existing fire protection guidance
  - Schedule on track for draft issued September 1999
- **NFPA 805**
  - Provides for a comprehensive risk-informed & performance-based alternative to the existing fire protection requirements
  - Schedule on track for completion May 2000
- **Fire Protection Functional Inspection Program**
  - Assess license implementation & NRC oversight of reactor fire protection program
  - Pilot inspections completed, assessment of results in progress, & NEI proposal under review
  - Commission paper due April 1999

# **OVERVIEW**

## **(Continued)**

- **IPEEE Program (Fire)**
  - To examine potential severe accident vulnerabilities & resolve GSIs
  - Preliminary review of submittals completed
  - Results used to support FPFI, NFPA 805 and fire research efforts
- **Fire Risk Assessment Research Program**
  - Improve understanding of fire risk, support current & future fire protection activities (e.g. NFPA 805) & improve analytical methods and tools
  - Expect results September 2000
- **Quad Cities**
  - February 1997 IPEEE submittal reported fire CDF of  $5E-03/\text{yr}$
  - Plant shutdown by licensee due to deficient safe shutdown analysis
  - Revised analysis concludes fire CDF  $6.6E-05/\text{yr}$
  - Analysis will be submitted by licensee April 1999

# **APPENDIX R, REG GUIDE & NFPA 805**

- **SECY 98-058, March 26, 1998 - Staff Proposed:**
  - **Delete Requirement from Section III.M of Appendix R for “Noncombustible” Penetration Seal Material**
  - **Develop Comprehensive Fire Protection Regulatory Guide**
  - **Defer Rulemaking and Work with the National Fire Protection Association to Develop a PB/RI Consensus Standard for NPPs**
- **May 5, 1998, Letter From R. Beedle, NEI to Chairman Jackson, Industry Supports Development of Reg Guide and NFPA Process to Develop a Consensus Standard for Perf-Based Fire Protection (NFPA 805)**
- **June 30, 1998, SRM Approved Staff Proposals**
- **SECY 98-247, October 27, 1998, Status of NFPA Activities, Assessment of Progress and Direction -Resolution of Issues From SECY 97-127**

# **REVISION TO APPENDIX R**

- **ACRS Ltr to Chairman Jackson, July 20, 1998, Agrees with the Commission's direction in the 6/30/98, SRM that Section III.M of Appendix R be amended to eliminate the requirement that penetration seals should utilize only noncombustible materials.**
- **October 1998 - Memo to Commission Outlining Status & Schedule**
  - **Staff Pursuing Rulemaking to Amend Sect. III.M of Appendix R & Revise 10 CFR 50.48 to Delete Appendix R Implementation Schedule and Footnote to Fire Protection Guidance Documents**
  - **July 1999 - Publish Proposed Rule**
  - **April 2000 - Final Rule**

# **COMPREHENSIVE FIRE PROTECTION REG GUIDE**

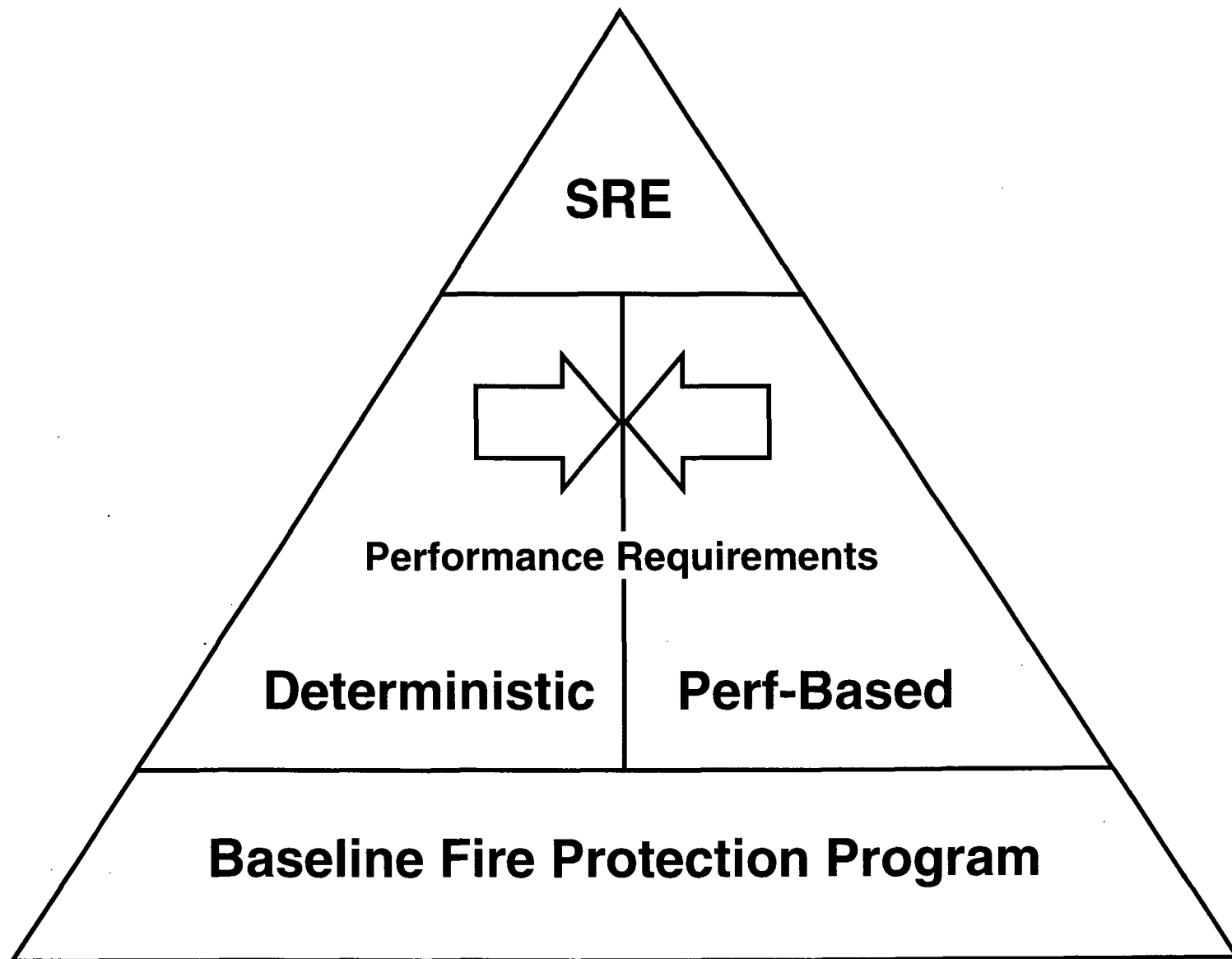
- **Existing Fire Protection Guidance is Contained in Numerous Documents**
- **Some Guidance Conflicts**
- **Additional/Revised Guidance is Needed**
  - **Compensatory Measures**
  - **Circuit Analysis**
- **December 1998 - Draft Outline Made Public**
- **September 1999 - Issue Draft RG for Public Comment**



# **NFPA 805**

## **Scope & Structure**

- **Scope - Comprehensive Fire Protection Standard to Protect the Safety of the Public, Environment, and Plant Personnel, as Well as Limit the Potential for Economic Loss**
- **Structure**
  - **Goals - Overall outcome, qualitative**
  - **Performance Objectives - More specific, qualitative/quantitative**
  - **Performance Criteria - Engineering terms, quantitative**
  - **Performance Requirements - Deterministic/Performance-Based**



# **NFPA 805**

## **Status & Schedule**

- **Draft Available to Public - November 1998**
- **Committee Meeting - January 1999**
- **Public Proposals Closes - February 19, 1999**
- **Committee Meeting on Public Proposals -  
March 1999**
- **Standard Issued for Public Comment - July 1999**
- **Public Comments Due - October 1999**
- **Final Draft Published - March 2000**
- **NFPA Membership Vote - May 2000**

# **FIRE PROTECTION FUNCTIONAL INSPECTION PROGRAM PROGRAM OBJECTIVES**

- **Inspect Thermo-Lag corrective actions**
- **Determine if licensees are maintaining licensing and design bases**
- **Assess NRC reactor fire protection program (Appendix R, IPEEE)**
- **Determine appropriate level of future fire protection inspections**
- **Renew industry attention to fire safety**

# **PROGRAM SCOPE AND ACCOMPLISHMENTS**

- **Developed new inspection procedures**
- **Conducted four pilot inspections using risk insights**
  - **River Bend**
  - **Susquehanna**
  - **St. Lucie**
  - **Prairie Island (inspected licensee self-assessment)**
- **Conducted FPFI-like inspections at two additional plants**
  - **Quad Cities (restart)**
  - **Clinton (SET and restart follow-up)**
- **1-Day workshop**

# **PRELIMINARY OBSERVATIONS**

- **Some licensees expended significant resources to prepare**
- **Many problems found during FPFIs would not have been uncovered by core inspections**
- **Non-compliances were of varied safety significance**
- **Licensee self-assessments based on FPFI techniques may be beneficial**
- **Renewed industry attention of reactor fire safety**
- **No significant problems found with NRC reactor fire protection program (Appendix R)**

# **REMAINING WORK**

- **Develop method for assessing risk significance of fire protection deficiencies**
- **Assess risk significance of FPII findings**
- **Assess lessons learned from FPII pilot program**
- **Assess Nuclear Energy Institute Proposal (FPII Backup 3)**
- **Factor fire protection inspection program into new oversight process**
- **Complete final report to the Commission**

# **IPEEE PROGRAM**

- **Total of 74 IPEEE submittals originally expected**
  - **Completed preliminary reviews of 70 submittals (4 plants shutdown)**
  - **Completed reviews and issued SERs for 11 submittals**
- **“Preliminary Perspectives Gained from Initial IPEEE Submittal Reviews” (Report to Commission)**
  - **Many licensees implemented plant-specific modifications (procedural and hardware) to improve plant safety.**
  - **Fire events can be significant/dominant contributor to total plant CDF**
  - **Comparison of quantitative CDF between plants is not straightforward**



# **USE OF RISK INFORMATION FROM IPEEE PROGRAM**

- **Plant-specific improvements**
- **Identify/prioritize fire research program**
- **Address certain generic safety issues**
- **Prioritize areas for fire protection plant inspections**
- **Assess the effect of exemptions to Appendix R on fire risk**
- **Incorporate lesson learned into NFPA 805, Performance Based Standard for Fire Protection**

# **FIRE RISK ASSESSMENT IMPROVEMENTS**

- **Robust fire risk assessment (FRA) methods, tools, and data are needed to support the move towards risk-informed, performance-based regulation. Applications include: NFPA 805, inspection findings, “hot shorts.”**
- **Important weaknesses in the current FRA state of the art allow significant variability in IPEEE and FRA qualitative and quantitative results.**
- **FRA weaknesses have been identified and work on improvements has been initiated. SECY-98-230 summarizes key research findings and important FRA needs.**
- **FRA research program involves collaboration with industry, academic, government, and international organizations. Significant improvements are expected by the end of FY 00.**

# **QUAD CITIES SAFE SHUTDOWN IMPROVEMENTS FOR RESTART**

- **Revised and Validated Safe Shutdown Analysis and Safe Shutdown Implementing Procedures**
- **Implemented enhanced fire protection compensatory measures in high risk plant areas**
- **Added one person per shift to augment shift crew; trained staff**
- **NRC conducted extensive Safe Shutdown inspection**
- **Units 1 and 2 restarted in May 1998**

# **QUAD CITIES RISK RE-EVALUATION AND CONTINUING SAFE SHUTDOWN IMPROVEMENTS**

- **Re-evaluation of risk (6 E-5 per reactor year)**
- **Improving Safe Shutdown Methodology Objectives**
- **Physical Plant Improvements (Planned to Date)**
- **Continued focused NRC involvement**

**Backup Slides**

**FPFI Program**

# **FPFI BACKGROUND**

- **SECY-93-143, “NRC Staff Actions to Address the Recommendations in the Report on the Reassessment of the NRC Fire Protection Program”**
- **SECY-95-034, Status of Recommendations Resulting from the Reassessment of the NRC Fire Protection Program”**
- **SECY-96-267, “Fire Protection Functional Inspection Program”**
- **SRM of February 7, 1997**
- **SECY-98-187, “Interim Status Report - Fire Protection Functional Inspection Program”**
- **SECY-99-???, “Second Interim Status Report - Fire Protection Functional Inspection Program”**

# **COMMISSION INTEREST (SRM OF FEBRUARY 7, 1997)**

- **Strategies for shortening time for benefits of the program to become available to all licensees**
- **Prioritize plant reviews so most vulnerable plants are reviewed first**
- **Prioritize inspection modules so most significant parts of inspection could be included with other NRC inspections**
- **Use licensee self-assessments**

# **NEI PROPOSAL**

- **Rapid phaseout of FPFIs in favor of self-assessments**
- **Approach fire protection inspections within context of new assessment process**
- **Develop fire protection performance indicators**
- **Baseline inspections where performance indicators are not available**
- **Perform self-assessment when baseline inspection or performance indicators indicate shift in performance from green to white band**
- **Plants should use NRC inspection modules for self-assessments**
- **NRC should conduct FPFIs when performance approaches unacceptable performance band**



**Backup Slides**

**IPEEE Program**

# **IPEEE PROGRAM – BACKGROUND**

- **Generic Letter 88-20, Supplement 4 issued on June 28, 1991**
- **Objectives of IPEEE**
  - **To develop an appreciation of severe accident behavior**
  - **To understand the most likely severe accident sequences that could occur at its plant**
  - **To gain a qualitative understanding of the overall likelihood of core damage and fission product release**
  - **If necessary, to reduce the overall likelihood of core damage and fission product releases by modifying, where appropriate, hardware and procedures that would help prevent or mitigate severe accidents.**

## **IPEEE PROGRAM – BACKGROUND (cont.)**

- **External Events Included in IPEEE**
  - **Seismic events**
  - **Internal fires**
  - **High winds and tornadoes**
  - **External floods**
  - **Transportation and nearby facility accidents**

## **IPEEE PROGRAM – BACKGROUND**

- **“Preliminary Perspectives Gained from Initial IPEEE Submittal Reviews”**
  - **Report to Commission - Jan. 1998**
- **Total of 74 IPEEE submittals originally expected**
  - **Completed preliminary reviews of 70 submittals**
  - **Four plants permanently shut down**
  - **Completed reviews and issued SERs for 11 submittals**

# **PRELIMINARY CONCLUSIONS**

- **IPEEE program generally successful in meeting intent of Supplement 4 to GL 88-20**
- **Many licensees implemented plant-specific modifications (procedural and hardware) to improve plant safety.**
- **Fire events can be significant/dominant contributor to total plant CDF**
- **Comparison of quantitative CDF between plants is not straightforward because of variability in: (1) methods, (2) input and modeling assumptions by analysts, and (3) level of detail in analyses.**
- **Staff reviews of submittals focused on meeting intent of IPEEE program**
  - **Examine potential severe accident vulnerabilities**
  - **Resolution of specific generic safety issues**

# **EXAMPLES OF PLANT MODIFICATIONS**

- **Hardware and Procedural Improvements**
  - Relocate cables out of fire area
  - Upgrade fire barriers
  - Improve fire suppression systems (e.g., install additional sprinkler heads)
  - Provide waterproof cabinets or splash guards for electrical equipment
  - Improve fire response procedures
  - Modify procedures to control transient combustibles
  - Modify procedures to control active fire barriers

# **RISK IMPORTANT AREAS**

- **Dominant fire risk-important areas**
  - Main control room
  - Cable spreading room
  - Switchgear room
- **Other frequently cited important areas**
  - Turbine building
  - Battery room
  - DC equipment room
  - Diesel generator room
  - Cable routing areas

## **INTERACTIONS WITH NEI/EPRI - IPEEE PROGRAM**

- **EPRI Fire PRA Implementation Guide**
  - Provide detailed methods and supporting technical information to utilities
  - Reduce “conservatism” in past fire PRAs
- **NRC review of guide:**
  - Some clarification and improvements over previous documents; some areas could mask information needed to identify potential vulnerabilities
- **NRC/NEI/EPRI interacting to resolve generic requests for additional information (RAIs) (e.g., low heat release rates in electrical cabinets)**
- **Outcome - EPRI revised guidance**



## **USE OF RISK INFORMATION FROM IPEEE PROGRAM**

- **Plant-specific improvements**
  - **About one-half of licensees have implemented or proposed plant improvements in fire area**
- **NRC/industry activities**
  - **Identify/prioritize fire research program (e.g., importance of turbine building fires)**
  - **Address certain generic safety issues (e.g., Unresolved Safety Issue (USI) A-45, Shutdown Decay Heat Removal Requirements)**
  - **Prioritize areas for fire protection plant inspections**
  - **Assess the effect of exemptions to Appendix R on fire risk**
  - **Incorporate lesson learned into NFPA 805, Performance Based Standard for Fire Protection**

## **EFFECT OF EXEMPTIONS TO APPENDIX R ON FIRE RISK**

- **Has the cumulative effect of exemptions impacted fire risk at nuclear power plants? (SRM on SECY 98-058, June 30, 1998)**
- **Outline**
  - **Identify plants with high fire CDF (based on IPEEE submittals)**
  - **Review exemptions/deviations to fire protection regulations for these plants**
  - **Review dominant fire sequences and contributors to CDF**
  - **Identify correlations (if any) between exemptions and dominant sequences**
- **Report to Commission - May 1999**

## **Backup Slides**

### **Fire Risk Assessment Program**

# **OVERALL FRA PROGRAM OBJECTIVES**

- **Improve qualitative and quantitative understanding of the risk contribution due to fires in nuclear power plants.**
- **Support ongoing or anticipated fire protection activities, including the development of risk-informed, performance-based approaches to fire protection.**
- **Develop improved fire risk assessment methods and tools (as needed to support the preceding objectives).**

# **FRAMEWORK FOR IDENTIFYING PROBLEMS**

- **Fire protection defense in depth**
  - **Prevention**
  - **Detection and suppression**
  - **Mitigation**
- **FRA analytical framework**
  - **Initiation frequency**
  - **Likelihood of equipment damage**
  - **Likelihood of plant damage**
- **Work is proceeding on improvements (data, methods, tools, understanding) for all three terms**

# **CURRENT DETAILED OBJECTIVES**

- **Improved estimates of the frequencies of challenging fires**
- **Improved fire modeling tools (including guidance)**
- **Mode-specific thermal fragilities for cables and other key components**
- **Identification of scenarios for which smoke effects may be risk significant**
- **Improved estimates of the probability of fire and fire effects containment (including active and passive barriers)**
- **Configuration- and condition-sensitive fire protection system reliability estimates, including guidance for application**
- **Improved HRA tools for fire scenarios**
- **Improved tools for assessing risk impact of circuit interactions**
- **Improved understanding of the implications of actual fire events for FRA**

# **RELATIONSHIP WITH OTHER PROGRAMS AND ACTIVITIES**

- **Needs Identification**
  - **National Fire Protection Association (NFPA) 805**
  - **Industry (e.g., NEI)**
- **Information Exchange**
  - **EPRI/NRC Memorandum of Understanding (MOU)**
  - **International Cooperative PRA Research Program (COOPRA)**
  - **OECD/NEA/CSNI Principal Working Group 5**
- **Collaborative and Supporting Research**
  - **National Institute of Standards and Technology (NIST)**
  - **University of Maryland**

# Codes and Standards Making a System

# NFPA®





# **Introduction**

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# WHAT IS NFPA?

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- ◆ National Fire Protection Association
- ◆ Founded in 1896
- ◆ Private, Non-Profit, Voluntary Codes and Standards Developer
- ◆ ANSI Accredited Organization
- ◆ Membership Organization - 69,000
  - ◆ Members in U.S. and 79 Nations



# NFPA Codes and Standards Adopted and Used By:

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- ◆ Federal Government
  - ◆ HHS - Health and Human Services Admin.
  - ◆ OSHA - Occupational Safety & Health Admin.
  - ◆ GSA - General Services Administration
  - ◆ DOD - Department of Defense
  - ◆ FAA - Federal Aviation Administration
- ◆ States, Counties, Cities, and Towns
- ◆ Architects, Engineers, and Designers
- ◆ Building Code Organizations
- ◆ Insurance
- ◆ Industry



# Federal Use of Private Sector Standards

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- ◆ OMB A-119 (since 1983)
  - Federal Government Staff Participation in Private Sector Standards Development and Urges Adoption of Standards for Carrying Out Public Policy.
- ◆ P.L. 104-113 “Technology Transfer Act”
  - Codifies OMB A-119
  - Directs “All Federal Agencies and Departments Shall use Technical Standards that are Developed or Adopted by Voluntary Consensus Standards Bodies, Using such Technical Standards as a Means to Carry Out Policy Objectives...”



# Projects Requested by Federal Regulators

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- ◆ OSHA

- ◆ NFPA 70E - Electrical Safety Requirements for Employee Workplaces

- ◆ EPA

- ◆ NFPA 2001 - Clean Agent Fire Extinguishing Systems

- ◆ Coast Guard

- ◆ NFPA 301 - Merchant Vessel Fire Protection

- ◆ CPSC

- ◆ NFPA 720 - CO Detector Installation



# NFPA Codes and Standards Process

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- ◆ Member of ANSI - American National Standards Institute
- ◆ Accredited Consensus Process:
  - ◆ ~5400 Committee Members
  - ◆ 210 Committees
  - ◆ 290 Documents
  - ◆ 1/3 Balance by Interest Category
  - ◆ 2/3 Consensus to Change Document



# Electronic Access to NFPA

- ◆ NFPA's Homepage: [www.NFPA.org](http://www.NFPA.org)
- ◆ Contains
  - News, press releases, product information, fire investigation reports, calendar of events, staff directory and E-mail addresses, ROP's and ROC's, membership information, hot links to other organizations
- ◆ ROP's and ROC's Browseable via Adobe Acrobat
- ◆ Proposals and Comments can be Viewed and Submitted Electronically





# **Review of A2000 Cycle**

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- **Nov. 25, 1998-Draft NFPA 805 available to the public**
- **Jan. 26-28, 1999-Committee acts on internal proposals**
- **Feb. 19, 1999-Public proposal closing date**
- **Mar. 16-18, 1999-Committee completes ROP meeting**
- **Oct. 8, 1999-Public comment closing date**





# **Review of A2000 Cycle, cont.**

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- **Dec. 27, 1999-Final date for ROC meeting**
- **May 14-18, 2000-NFPA membership votes on document in Denver, CO**
- **July 20, 2000-Standards Council issues document.**
- **Sept/Oct. 2000-NFPA 805 available**



# Conclusions

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- **Project is on schedule**
- **Committee still has ROP and ROC period to make changes and address concerns**
- **All public input (proposals and comments) must be addressed by committee**

## NFPA 805: Implementation Opportunities

- Provides more flexibility than current standard
- Supports increased focus of NRC and licensee resources on risk-significant areas
- Provides a context to assess significance of emergent fire protection issues

NEI

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## NFPA 805: Implementation Concerns

- Extensive changes to long-standing fire protection licensing bases will be challenging
- Licensee options of *all or nothing* to adopt the standard are too restrictive
  - Incremental application of risk information and performance bases within the current licensing bases is possible
- Regulatory acceptance criteria for licensee implementation will take time to develop

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## Conclusions

- NEI supports the NFPA 805 development process.
- The development process should be completed.
- Plants should be permitted to use insights supporting NFPA 805 to make selected changes to the existing licensing bases.

NEI

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## NEI Views on Fire Protection Standard Implementation

Ralph Beedle, NEI  
David Modeen, NEI

NRC Commission Briefing

February 9, 1999



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## NEI Support for NFPA 805 Development

- NEI represented on NFPA committee by two utility fire protection experts
- Provided opportunity for extensive discussion of draft standard at a recent information forum
- Working with NFPA to arrange a plant demonstration of the draft standard this summer



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## NEI Views on NFPA 805

- Considerable effort expended to develop high quality draft
- Process needs to continue to completion to assure best product
- Implementation of NFPA 805 offers opportunities and concerns



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**UNION OF  
CONCERNED  
SCIENTISTS**



# **Fire Protection Problems: Easiest Target in the World**

**David A. Lochbaum**  
**Union of Concerned Scientists**

**February 9, 1999**

# Introduction

- Moving target is said to be difficult to hit.
- Fire protection problems must be the easiest target to hit since there's been no discernable movement since 1980.
- If compliance with fire protection regulations were needed to generate electricity, problems would have been resolved long ago.

# **1975 Browns Ferry Fire**

- **03/22/75: Worker using candle to check for air leaks ignites combustible material in cable tray penetration.**
- **Fire alarm is not sounded for several minutes while workers attempt to extinguish flames.**
- **Fire is out of control before fire alarm is sounded.**
- **Because fire affects energized cables, management does not allow water to be used.**
- **Fire burns for over six hours.**
- **When water is finally authorized, fire is put out within 10 minutes.**

# 1995 Waterford Fire

- **06/10/95: Grid disturbance caused turbine trip.  
Worker reports heavy smoke in turbine building.**
- **Fire alarm is not sounded for 29 minutes while workers  
search through heavy smoke for flames.**
- **Fire detector alarms in control room were ignored by  
operators who were directing “search” for flames.**
- **Fire is out of control before fire alarm is sounded.**
- **Because fire affects energized cables, fire brigade  
leader does not allow water to be used.**
- **Fire burns for over an hour.**
- **When water is finally authorized, fire is put out within  
4 minutes.**



# **Inadequate Determination of Technical Bases for Regulations**

- In NUREG-1552, in response to Rep. Markey, and in meeting with NIRS and UCS, NRC staff stated that the technical basis for the non-combustibility requirement in 10 CFR 50, App. R, Section III.M was not known.
- The technical basis is explicitly specified by the NRC Commissioners during their review of the App. R rulemaking (see transcript of 10/16/80 Commission meeting with the draft final rule):
  - Commission specifically refused the industry's proposal to require penetration seals to meet same rating as wall.
  - Commission specifically required non-combustible fire barrier penetration seal material to prevent combustible cable jackets from propagating fire across fire wall (i.e., wick effect).

# **Inadequate Determination of Technical Bases for Regulations**

## **■ App. R, Section III.N, Fire Barrier Cable Penetration Seal Qualification**

- “Some commenters suggested that this entire section be deleted and replaced with the following two sentences: ‘Penetration seals shall provide the equivalent protection which is required of the fire barrier. Evaluation of the penetration seals based upon a design review and relevant test data or qualification tests may be made.’”
- “The Commission has reconsidered this issues and revised the rule to: (a) require the use of only non-combustible materials in the construction of such fire barrier penetration seals; (b) require such fire barrier penetration seals to be qualified by test; and (c) require such tests to satisfy certain acceptance criteria.”

## **■ App. R Subpart III.M matches the Commission’s express direction. The Commission specifically refuted the very policy which the NRC staff is now following.**


# **Inadequate Determination of Technical Bases for Regulations**

- **IN NUREG-1552, the NRC staff advocates that fire barrier penetration seals need not be non-combustible but merely meet the same fire rating as the wall or floor.**
- **This NRC staff position is virtually identical to that position specifically discarded by the Commission in 1980.**
- **Recommendations: Do not issue proposed rulemaking for risk-informed fire protection regulations until the technical bases for the existing regulations are fully understood. Enforce the existing rule until the rule is changed.**

# **Non-conservative Risk Studies**

- In the last decade, there have been numerous reports of missing or deficient fire barrier penetration seals.
- Within the past few years, licensees have developed plant-specific risk assessments.
- Some, if not all, of these risk assessments assume 100% fire barrier penetration seal integrity (i.e., 0% chance that fire-rated wall or floor will be breached by fire).
- Given documented history of fire barrier penetration seal problems, it is non-conservative to assume 100% effectiveness in preventing fire propagation.
- Recommendation: Do not base risk-informed fire protection rules on deficient risk assessments.

# **Non-conservative Risk Studies**

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- **If risk assessments accounted for finite probability of improperly installed fire barrier penetration seals :**
    - **relative safety significance of penetration seals could be determined**
    - **since plants have 2,000 to 10,000 penetration seals, prioritization would allow licensees/NRC to focus inspections on more important areas**
    - **if it takes 1 man-hour to examine a penetration seal, it would take 5 man-years to examine all seals in plant with 10,000 seals**
    - **with proper focus, 100 inspection hours could cover the 100 highest ranked penetrations, or the bulk of the fire risk profile**

# Summary

- Browns Ferry's lessons have not been learned and those problems were repeated at Waterford in 1995.
- The NRC staff must fully document the technical bases for existing fire protection regulations as part of the rulemaking process.
- Risk-informed fire protection regulations should not be adopted if they rely on deficient risk assessments.
- Risk assessments must reflect reality of fire barrier penetration seal problems.
- Until the final fire protection rule is implemented (some years hence), the existing fire protection regulations must be rigorously enforced.

**NUCLEAR INFORMATION AND  
RESOURCE SERVICE**

**COMMISSIONERS BRIEFING  
ON FIRE PROTECTION**

**FEBRUARY 9, 1999**

# **TIME TO RESOLUTION FOR NONCOMPLIANCE OF FIRE PROTECTION ISSUES**

- **Thermo-Lag resolution still lags**

**-1981 Appendix R was promulgated to protect safe shutdown power, instrumentation and control cables from fire.**

**-79 U.S. reactors installed Thermo-Lag fire barriers systems, many on single source contracts.**



**-Thermo-Lag failed**

- 1) combustible and constitutes a fuel for fire**
- 2) repeated fire test failures**
- 3) failed the standardized hose stream test**
- 4) claims for a low ampacity derating unreliable**
- 5) seismically inadequate**
- 6) problematic to install**

**-Office of the Inspector General reported that as early as 1982, NRC had warning that Thermo-Lag did not work**

**-A safety-conscious fire protection consultant frustrated by lack of NRC enforcement reports his concerns to NIRS in 1991**

**-Information Bulletin 92-01, June 24, 1992 declaring Thermo-Lag fire barriers “inoperable.”**

**-NIRS files 2.206 on July 21, 1992 and is rejected by NRC on August 12, 1992**

**-By the end of 1993, the nuclear industry through the guidance of NUMARC sets up a special task force to scrimmage with NRC as a Priority Issue “to re-establish the technical and licensing basis to qualify Thermo-Lag materials for use in one and three hour fire ratings as required by Appendix R.”**

**-1997 Industry drags out resolution, Confirmatory Action and Orders issued during 1998 to non-compliant utilities to set resolution dates for 1999 and 2000**

- The current NRC approach to inoperable fire barrier systems at Salem nuclear power station demonstrates a carry over of this lack of resolve to enforce policy**

**-March 18, 1981 NRC accepts Salem fire tests for 3M fire barrier product FS-195**

**-February 21, 1992 NRR receives “Referral of Potential Health and Safety Issue To NRR” for a failed fire test**

**-May 28, 1993, NRC issues IN 93-41 indicating deviations between tested and installed configurations, failed fire tests, and hose stream tests not performed.**

**-December 3, 1993, NUMARC industry-wide workshop focuses on inoperable cable raceway fire barriers at Salem.**

**-PSE&G's Salem Unit 1 is removed from service May 16, 1995 and Unit 2 on June 17 and commits not to restart without permission of NRC. Units are down for over two and a half years. IN 93-41 is not addressed as restart issues.**

**-September 23, 1998, PSE&G presents Salem Raceway Fire Barrier Wrap Project for compliance by 2002.**

- **Examples of a licensing system that simply accepts without verification and validation the licensee representation which then turns out to be inaccurate.**
- **To avoid replacement of inoperable fire barriers, industry proposes to perform a circuit analysis for alternate circuits sidestepping a key and problematic regulatory requirement for tested and rated barriers.**

- **NRC is now backing away from Appendix R altogether with a move to “risk informed” guidance for licensees despite a myriad of staff identified questions that Appendix R was intended to prescriptively address**
- **No resolution or compliance date within sight**

## **RELIANCE ON INDEFINITE AND UNRELIABLE FIRE WATCHES AS RESOLUTION TO NON- COMPLIANCE WITH FIRE PROTECTION REGULATIONS**

- **There is an appropriate role for temporary fire watch as in the case of welding operations in fire zones**
- **The use of fire watch as a “compensatory” measure for long term inoperable fire barriers is an abuse of its intended role**

- **Commissioner Ivan Selin, Fire Safety At Nuclear Power Plants, subcommittee on Oversight and Investigations (March 3, 1993):**

**“Fire watches are not new to power plants. We have always had them. If a particular system is out of repair for 6 months or 9 months, fire watches go out. People are already trained to do fire watches. They don’t expect to do them for 2 years fulltime. That’s a real strain. It’s expensive, and it’s something that takes surveillance.”**



- **Thermo-Lag fire watches now in place for <sup>18</sup>/~~56~~ months**
- **At least two reactor sites will probable close with Thermo-Lag fire watches in place**
- **Fire watches do not constitute a “compensatory” level of protection for a rated passive fire barrier system.**
  - A rated fire barrier is designed to physically protect safe shut down cables from fire by Appendix R standards for up to 3 hours in the event that fire fighting brigades maybe prevented by heat and radiation from**

**entering an area to extinguish a fire in a safety critical area.**

**-A rated and tested fire barrier system is not subject to dereliction of duty or falsification of duty logs**

**-More appropriately, fire watch personnel constitute a compensatory measure for inoperable detection systems**

## **CONCLUSION**

- **Washington Post November 8, 1998  
“FAA Missed Warning on Insulation Burn Test”  
regarding the September 2 crash of Swiss Air Flight 111  
and combustible insulation**
- **Case study of a critical safety issue buried within a  
government institution, subject to tight budgets and a  
single event**
- **The public would not tolerate the presence of indefinite  
in-flight fire watches for inoperable aircraft insulation  
as an interim solution**

- **Significantly more is riding on nuclear power stations operating with inoperable fire protection systems without timely regulatory resolution and enforcement**
- **Why should the public be anymore tolerant of the nuclear power industry and the NRC?**