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UNITED STATES NUCLEAR REGULATORY COMMISSION  
RISK-INFORMED PERFORMANCE-BASED REGULATION

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THURSDAY

AUGUST 2, 2007

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The Commission convened at 1:30 p.m., Dale E. Klein, Chairman presiding.

NUCLEAR REGULATORY COMMISSION

DALE E. KLEIN, CHAIRMAN

EDWARD McGAFFIGAN, JR., COMMISSIONER

GREGORY B. JACZKO, COMMISSIONER

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1 PANEL 1: NEI

2 TONY PIETRANGELO, NEI

3 RICHARD ROSENBLUM, Senior Vice President and Chief Nuclear  
4 Officer, Southern California Edison

5 MARK McBURNETT, Vice President, South Texas Project

6 GREG KRUEGER, Senior Manager of Risk Management, Exelon

7

8 PANEL 2: ASME

9 KENNETH R. BALKEY, Vice President, ASME Nuclear Codes and  
10 Standards

11 KEVIN ENNIS, Staff Director, ASME Nuclear Codes and Standards

12 RICK GRANTOM, Chair, ASME Committee on Nuclear Risk  
13 Management

14

15 PANEL 3: NRC STAFF

16 LUIS REYES, Executive Director for Operations

17 GARY HOLAHAN, Deputy Director, Office of New Reactors, NRR

18 FAROUK ELTAWILA, Director, Division of Risk Assessment and  
19 Special Projects, RES

20 MARK CUNNINGHAM, Director, Division of Risk Assessment, NRR

21 CHARLES ADER, Director, Division of Safety Systems and Risk  
22 Assessment, NRO

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

CHAIRMAN KLEIN: We will proceed with getting educated on risk informed performance based activities. I know that this was an issue that actually started even before Commissioner McGaffigan came on board. I was looking at in 1995 when a policy statement was created to look at risk informed performance based and I think there's a lot of accomplishments that have been made since then; a few challenges along the way. And so we look forward to hearing today about those activities. We'll hear first from industry then we'll hear from ASME and then we'll hear from our staff. Any comments before we start? Tony, do you want to start?

MR. PIETRANGELO: Mr. Chairman, Commissioners, good afternoon. We appreciate the opportunity to be here to provide an industry perspective on risk informed performance based regulation. With me to provide today's presentation is Dick Rosenblum, the Senior Vice President and Chief Nuclear Officer from Southern California Edison; Mark McBurnett, Vice President from South Texas Project; and Greg Krueger from Exelon, who is the Senior Manager of Risk Management at Exelon. We think we've got a pretty good perspective to provide you with here today.

I think our last briefing, Chairman, was just before you got here so we are going to provide a historical perspective, even before Commissioner McGaffigan started on the Commission. Also, go through progress since that briefing last May. Talk about the paper we sent the Commission in mid-July on the safety benefits of

1 PRA. That's an update to an EPRI paper that we provided to the Commission in  
2 the 2001 time frame.

3 We'll also talk about some of the recently approved technical specifications  
4 initiatives and we have two plants here who are the pilots for those important  
5 initiatives. Talk about some success paths going forward to further go forward  
6 with risk informed performance based regulation and then offer some conclusions  
7 at the end.

8 With that, I want to go to the third slide. If this looks like an old slide, it is.  
9 This was developed circa 1997 and it came out of a Chief Nuclear Officer meeting  
10 we had back then on the sole topic of risk informed performance based regulation.

11 Prior to that, we would devote an agenda item – many agenda items that  
12 the NSIAC looks at, but we thought we needed a full day to really go through what  
13 it meant to move forward with risk informed performance based concepts. As a  
14 result of that meeting, the guidance we received from the Chief Nuclear Officers  
15 was to try to make stepwise, incremental improvements and to go at a deliberate  
16 pace because there was a lot of things that had to happen to make this successful.

17 We literally interpreted that and developed a step chart, if you will, that  
18 shows the applications on the steps and the foundation blocks to the side which  
19 we needed to support those applications. So now if you look up 10 years later,  
20 we've really had a lot of success with risk informed performance based concepts.

21 We've completed most of the initiatives on here. The two exceptions; fire  
22 protection. We have an extensive effort under way on that. We'll talk about it a

1 little bit and I know the staff's going to talk about it; as well as ECCS requirements  
2 in 50.46a. But it just goes to show you that you can put your nose to the  
3 grindstone and work away at these applications and you can make significant  
4 progress over a relatively short period of time. Next slide, please.

5 Since the last briefing, the NRC staff has issued Reg Guide 1.200 that  
6 endorses the ASME standard, the internal events at power standard. We  
7 conducted an industry workshop with NRC participation in March. We had every  
8 plant in the country represented; very good participation from the staff that went  
9 into the details of the ASME standards and the Reg Guide's endorsement of that.

10 Again, we've had significant risk informed tech spec applications approved  
11 both in late '06 and recently in '07. MSPI, Mitigating Systems Performance Index,  
12 implementation has proceeded successfully. We're just starting our lessons  
13 learned on the first year of implementation of MSPI and we'll plow that back into  
14 our monthly interactions with the Reactor Oversight Process Task Force that the  
15 NRC maintains.

16 As you know, there's been a major industry effort towards developing fire  
17 PRAs and transitioning to NFPA 805. That's certainly filling our plate and we'll talk  
18 about that in some detail.

19 And then 50.46a. We still support it very strongly. We see it as an enabling  
20 rule to move forward with the concepts that were started back in the early to mid-  
21 90's. We'd like to see progress on that going forward. With that, I want to turn it  
22 over to Dick.

1                   MR. ROSENBLUM: Thank you, Tony. I want to just bring the CNOs  
2 and plant operator's perspective to this. I'm not a PRA professional or practitioner.  
3 I'm the guy who worries about how does the plant serve both my customer's  
4 needs, my community's needs and the needs of my stockholders and investors.

5                   More than anything, what we found is PRA has permeated the way we  
6 operate and manage our plant, particularly at San Onofre, but I think that's true  
7 throughout the industry. It has fundamentally sharpened and brought perspectives  
8 that we didn't have before to the operations and maintenance activities we do  
9 literally every day and every shift.

10                  Historically, the safety and operational improvements as well as the  
11 improvements in the models have come primarily from the licensees. We found  
12 many, many ways to physically change our plants that allow us to improve the  
13 level of safety at our plants. I'm just going to use a couple of quick examples.

14                  At one plant, they found an alternate cooling path for the reactor coolant  
15 pump seals; very small investment and fundamentally improving the design safety  
16 of the plant. At San Onofre, we found one of our big risk contributors was ocean  
17 fouling of our salt water cooling pumps which is our connection to the ultimate heat  
18 sink. That surprised us.

19                  That was certainly not something that came out of a deterministic view of  
20 the plant. It came out of the probabilistic view after operation and allowed us to  
21 understand that putting the backwash capability in to quickly restore them to  
22 service would fundamentally improve the safety level of the plant.

1           Those are just a few of the many, many changes that have been made  
2 throughout the industry with the insights and the precision and the greater  
3 sophistication that the PRA applications have provided us. We submitted earlier  
4 this last month the EPRI paper and I just want to talk about that for moment. If we  
5 can go to the next slide.

6           The fundamental conclusion from the paper is that PRA has allowed the  
7 industry, not alone, but in conjunction with many other activities to both improve  
8 the operation of our plants and dramatically improve the safety of our plants. Next  
9 slide, please.

10           If we want to look at what has caused that to happen, we see many factors  
11 that have contributed. Overall plant performance has improved. That's certainly  
12 improved the safety level. If we have fewer automatic reactor scrams, we have  
13 fewer transients and when we have fewer transients, we have fewer initiating  
14 events; the level of safety is higher.

15           Equipment performance as a result of many, many activities, but some of  
16 them directly attributable to PRA have improved the safety level of our plants. I  
17 think adding the backwash to the salt water cooling pumps is a pretty good  
18 example of taking what used to be an intensive, time-consuming maintenance  
19 activity and turning it into an action we can do virtually instantaneously. It takes  
20 minutes.

21           There have been improvements in the fundamental underlying design due  
22 to the PRA applications to the plant and our insights from them. Again, an

1 example here, I think, is helpful. Some of the tech spec changes that people have  
2 promulgated to actually change when we do certain activities in the plant from  
3 when the tech specs would have them done to when PRA would suggest they are  
4 more safely done have improved the safety level of the plant.

5         Again, an example would be, and I'll use San Onofre because I'm most  
6 familiar with it. We moved our diesel overhauls out of outages, a time when offsite  
7 power is somewhat fragile because of all the work that's going on in the plant into  
8 online maintenance because we could extend the outage time allowable that  
9 allowed us to do it online; that moved that activity to a time when it had a much  
10 smaller impact on the safety of the plant.

11         So there are many ways that these factors have come forward. One of the  
12 factors certainly is in improvement in overall safety as it's perceived in the EPRI  
13 report, is, in fact, we've sharpened our pencils on PRAs. We've understood them  
14 better. We've used better models that more accurately and less conservatively  
15 predict what the numbers are, but I believe that to be a fairly small contributor.

16         We took a look at NUREG 1115, updated it with some late data. That  
17 would suggest about a four-fold improvement in safety with the same models we  
18 used to use, at least in one instance. The EPRI paper suggests about a five-fold  
19 improvement in safety. So on that basis we'd say that kind of sharpening the  
20 pencil and improving our tools maybe is 20% or certainly in that range of the  
21 improvement we see in the paper.

22         More importantly than anything, though, I think it is the improved insights



1 we have from the better PRA models. In a world where we used to use tech specs  
2 to control what we did, technical specifications, we had fixed outage times. We  
3 would do things when they were allowed to be done. We didn't have the insight  
4 that allowed us to understand what the interaction of different pieces of equipment  
5 was.

6 In the world where we have online safety monitors, and many if not all of  
7 you have had an opportunity to see the ones we use at San Onofre, we have the  
8 ability to understand exactly the safety consequences of taking various pieces of  
9 equipment out, even when they're fairly subtle, and we have the opportunity to  
10 change that sequencing to obtain a much better level of safety in our plant.

11 So I think the bottom line would be that risk informed approaches have  
12 been demonstrated to be of value in both the operational realm, improving the  
13 capacity factor of the plant, and unarguably in the safety realm in improving the  
14 precision and sophistication with which we run our plants.

15 I'd like to turn it over now to Mark who will start talking about specific  
16 applications.

17 MR. McBURNETT: I'm going to start with slide nine. We are very  
18 pleased that the culmination of seven years of effort in a pilot activity on Tech  
19 Spec Initiative 4B has come to a head a couple of weeks ago, July 13th. The NRC  
20 approved and we implemented the risk managed tech specs at South Texas.

21 The technical specifications provide for basically limiting conditions for  
22 operations and surveillance requirements and a few other things, but in the case of

1 limited conditions for operation basically specifies how long a given piece of  
2 equipment can be out of service before the plant has to take action, typically shut  
3 down.

4 What risk managed tech specs has done is basically given us the tool to be  
5 able to go in and risk inform that duration that a piece of equipment can be out of  
6 service based on the actual configuration of the plant at the time. This applies  
7 during power operations and we're actually giving operators that flexibility.

8 Each one is, even though the risk-based allowed outage times would in  
9 some cases go for very long periods, depending on particular pieces of equipment,  
10 the technical specifications limit that to 30 days, so they can't go any longer than  
11 30 days on a given outage, allowed outage time extension.

12 While these are in place, while we're in that mode within an extended  
13 outage time, we put in place what we call risk-management actions, things to  
14 further mitigate the configuration of the plant. This may be items such as verifying  
15 that redundant equipment is indeed available or verifying alignments, maybe  
16 optimizing maintenance, returning certain equipment to service. Anything we can  
17 look at to help mitigate the circumstance. On to slide 10.

18 The risk-based initiative offers a number of benefits for us. Clearly, it really  
19 improves our overall safety performance by actually giving us more ability to focus  
20 on safety significant activities while at the same time providing operational  
21 flexibility. It does create fewer challenges to limited conditions for operations  
22 which will manifest itself in fewer opportunities for request for enforcement

1 discretion, fewer opportunities for emergency technical specification changes.

2 It also allows us to address tech spec 3.0.3 issues more appropriately for –  
3 if you're not familiar with 3.0.3 that's the technical specification that we call the  
4 "motherhood". It says if you're outside technical specifications, you have one hour  
5 to shut the plant down. You typically get in that configuration when you have more  
6 than one train out of service at a time. It's the common way to get into that.

7 This technical specification gives us a way to address those configurations  
8 in a way that's much smarter than just a one-hour and proceed to shutdown  
9 requirement. It gives us the ability to analyze that and determine what the real risk  
10 is to the plant and what an appropriate action is; which may be shut down or it may  
11 be correct the condition within a certain time frame and continue to operate.

12 As we prepare to initiate or implement the initiative tech spec, we  
13 conducted training at South Texas, which really further amplifying within our  
14 organization that already had extensive background in risk informed applications,  
15 but to ensure that the tech spec was well understood and well implemented. Slide  
16 11, please.

17 Note that South Texas has been a strong proponent and an industry  
18 pioneer in risk informed applications. Actually, we began in the 1980's with a  
19 developing probabilistic risk assessment. The initial driver for us to do that was  
20 the robust three-train plant design that we were looking for tools as to how we can  
21 better take advantage of the diverse design that weren't really available to us in  
22 the existing rules at the time.

1           Our initial significant tech spec application that was risk informed was a 14-  
2 day diesel allowed outage time that we obtained in the 1990's. Since that time,  
3 we've done a number of applications, risk informed applications, including tech  
4 spec changes. We've also been the pilot for the exemption from the special  
5 treatment requirements that culminated in the 50.69 rule. I just spoke to the pilot  
6 on the tech spec risk managed tech specs and we'll also plan to continue seeking  
7 risk informed initiatives.

8           The next one on our horizon is to submit later this year on the risk informed  
9 surveillance requirement test intervals that Greg will talk to in a minute. Again, we  
10 believe that the risk informed applications have significantly strengthened our risk  
11 culture; strengthened our safety of operations.

12           Ownership for these pools resides within the line organizations. The  
13 operators use it and it's ingrained in the fabric of their decision making process.  
14 It's used in the control room every day. It's used in the maintenance shops every  
15 day. It's used in work control every day. It is a fundamental tool that we use to  
16 manage the day-to-day operations of the plant. Slide 12.

17           I'll just conclude by noting that the safety benefits we believe have shown to  
18 be significantly complemented with the performance improvements. Dick showed  
19 the chart earlier with core damage frequency verses plant performance. We  
20 believe tells the story of how risk informing and safe performance in a risk  
21 informed regime support improving plant performance.

22           We believe that these tools add significant value as well as increase our

1 safety of operations and warrant further implementation within the industry, both in  
2 the current fleet and within the new plants. We encourage the Commission to  
3 continue to support further risk informed applications. With that, I'm going to turn it  
4 over to Greg.

5 MR. KRUEGER: Thanks, Mark. Exelon took the lead for the industry  
6 for tech spec initiative 5b using Limerick to demonstrate how we could take the  
7 technical specifications and the surveillance intervals defined within those and risk  
8 inform those intervals using information, history with regard to the surveillance  
9 tests themselves, and using risk insights to allow changes to those surveillance  
10 intervals.

11 Limerick, again, was the pilot for the entire industry. We used NEI 04-10  
12 and were key or instrumental in developing and refining that industry document as  
13 we took Limerick through the process. The scope of this program involves any  
14 periodic surveillance; any surveillance in which on a periodic basis be it weekly,  
15 monthly, yearly, can be examined or redefined under the program. We call this a  
16 Surveillance Frequency Control Program in that the technical specifications  
17 surveillance frequencies themselves are moved into a separate program  
18 document.

19 This was approved by the NRC last year in September. Within 60 days of  
20 that approval, we developed a procedural infrastructure to put this activity in place.  
21 The process that we go through is similar, if not exact, to the decision making  
22 process we follow at the station for all decisions; in that, as we look at the

1 candidates for surveillance interval changes, we bring those to the Plant Health  
2 Committee.

3 We evaluate the engineering history associated with that particular system  
4 were looking at. We do a risk evaluation of that. We implement through our core  
5 process and the standard processes we use for all changes at the plant to change  
6 this interval. We also have a performance monitoring aspect to this program such  
7 that we continue to look back at the insights we're getting with regard to the  
8 frequency change. I'm on page 14.

9 What's required to develop and support Initiative 5b are a number of items.  
10 One, the PRA insights are input into an integrated decision process. Again, it is  
11 not the numbers that drive the results, but it's the insights from the PRA that help  
12 along with all the other technical information to provide a package that allows us to  
13 change the surveillance interval.

14 What we did from a PRA perspective is we performed a gap analysis, both  
15 to the Reg Guide 1.200 and ASME standard. Just to review, we did a peer review  
16 of the Limerick PRA. We did that in the late 1990's. The NRC also during this  
17 pilot process came in and took a look at the PRA and the quality of the PRA being  
18 used to make the decisions. And again, looked at the standards that were out  
19 there and used those standards and regulatory guides as an enabler, which  
20 defines the set of conditions that we need to meet in order to apply the PRA.

21 We've put considerable investment not only in the Limerick PRA but all the  
22 Exelon PRAs in terms of capability and documentation. What I mean there is

1 we've increased the granularity or the level of detail within these models to allow  
2 us to evaluate specific details and issues, compared with those PRAs from 10  
3 years ago.

4 We've also considered external events qualitatively, both from a fire and  
5 seismic perspective. Just want to point out that as we changed the PRA over a  
6 number of revisions, the overall answer or the core damage frequency hasn't  
7 radically change, but the level of detail in which we can discern changes in risk  
8 has. Next slide.

9 So what are the benefits, the safety benefits of this initiative? It affects all  
10 aspects of plant operation. We have reduced reactivity management events. We  
11 have dose reduction as a result of not being next to equipment or going into areas  
12 that have higher dose. There's resource optimization, work management  
13 simplification, and reduced production risk.

14 To give you an example, we change the frequency of control rod notching  
15 at a BWR. Every week there was a requirement to notch the control rods; one  
16 notch in, one notch back up. One hundred eighty-five control rods over two units;  
17 370 reactivity or potential reactivity management events. That process took five  
18 control room operators four to five hours on a Sunday afternoon to complete.  
19 During which time no other activities were taking place because of the potential for  
20 any reactivity management events.

21 The cascading effect of being able to take this weekly surveillance to a  
22 monthly surveillance was that it freed the operations and the control room up to do

1 the clearances and the evaluation of risk for the upcoming work week. So it's  
2 totally changed the way we can assess where we're going to in terms of a plant  
3 configuration for the coming week as well as the organizational interfaces that  
4 occur with the control room. So it's been a very, very successful change in that  
5 one surveillance frequency.

6 And finally, briefly, I'd like to just reflect on the changing role of risk  
7 management. As mentioned before, it is very integral into the decision making  
8 process we have today. I've been in risk-management for a long period of time  
9 and I've observed that over the last seven years we've drastically changed how we  
10 use the PRA.

11 If I look back to the '90s, we used PRA as an engineering tool to prioritize  
12 work, to look at programmatic issues and work on the more significant items.  
13 Today, it is a 24/7 job. We are involved heavily in the operational decision making  
14 and support of many of the activities across the Exelon fleet. As such, the PRA  
15 resources to support that broad range of activities reflects the fact that everybody  
16 is using it.

17 We are stretched, but on the other hand, I reflect on that in terms of  
18 everybody from maintenance to operations to licensing is using risk in an informed  
19 way to make decisions both from an engineering perspective and from a licensing  
20 perspective. And with that, I'll turn it back over to Tony.

21 MR. PIETRANGELO: Slide 17, please. I want to talk about three  
22 specific success paths we see going forward to further risk inform performance



1 based activities and I'll touch on each of these three bullets in the subsequent  
2 slide. So, if you can go to slide 18.

3 First, I want to talk about infrastructure. The industry PRAs infrastructure,  
4 the PRA community if you will, is really saturated over the next several years.  
5 Some of the activities are listed here below. Trying to meet Reg Guide 1.200  
6 Revision 1, doing peer reviews on model revisions, the fire PRA development to  
7 support NFPA 805, ongoing application support activities like Greg just described,  
8 including the significance determination process which I'll come to in a second,  
9 and then new plant PRA development.

10 All this is a stressor on the infrastructure for PRA that we've got to be really  
11 selective in identifying our priorities for what we want to focus on. There's also a  
12 challenge for the NRC. First to maintain the SPAR models on their internal event  
13 at power models. This is a significant investment and as the industry expands its  
14 modeling capability, that's also going to be a challenge for the staff as well.

15 We have industry training programs under way and personnel development  
16 under way, but it's going to take several years to see an appreciable difference in  
17 the support necessary. We have an EPRI training program. I know the staff's  
18 going to talk about a joint program with ASME. They're both complementary. I  
19 just wanted to stress that now. We all need to be working on training and getting  
20 new people involved.

21 Next slide: capability versus expectations. The Commission has laid down  
22 a marker to have all the standards development organizations are working on

1 endorsed by the NRC by the end of 2008. Further in that SRM, I think there was a  
2 statement about if a licensee didn't have that capability, that the staff could de-  
3 prioritize any submittals supporting that. Bottom line, we think the expectation to  
4 do this is really not realistic anymore and all we have to do is look at the  
5 developments of what it took to get the ASME internal events at power standard.

6 That standard was issued in 2002. Reg Guide 1.200 Revision 1 which  
7 endorses that now is five years later. We had an industry pilot program in  
8 between that with five plants, two of which are sitting here. It just takes a long time  
9 for the standards development process to play out, to road test the standard that's  
10 being developed at the state of the art, apply it, get the lessons learned plowed  
11 back in and then be able to move forward on an industry-wide basis with those  
12 standards. So we really need to understand what happened and be patient with  
13 going forward with the other standards.

14 Internal events and fire are going to remain our priorities because they are  
15 the most significant contributors and we need to be risk informed. We're going to  
16 focus on what's most significant. Next slide, please.

17 I made reference to this SDP issue. I'll call it risk based versus risk  
18 informed on this slide. This comes from our acknowledgment that the SDP is  
19 really a risk-based process. They are no qualitative considerations or backstops, if  
20 you will, in the SDP.

21 It's problematic because for one, it's at a very low risk level that's within the  
22 uncertainty bands of most PRAs. And two, the threshold for the action matrix

1 within the ROP are pretty low. The result of that is a licensee really can't take a  
2 pitch on a finding. That is, they have to evaluate all of them because one white  
3 finding moves them over one column; two white findings in the same cornerstone  
4 moves them into the degraded column condition.

5 Therefore, that consumes a lot of PRA resources on the licensee time at a  
6 time when resources are precious with regard to PRA and trying to meet 1.200  
7 and trying to do fire and trying to do plant PRAs. It's obvious why licensees pay  
8 close attention to the action matrix, but really we're consuming a lot of PRA  
9 resources on these de minimis risk evaluations. Our conclusion is to move toward  
10 successfully, we have to make some process improvements to the SDP.

11 I already talked a little bit about regulatory expectations, but again, it was a  
12 long development period to endorse the internal event standard. In fact, the  
13 clarification just came out last Friday. That's really the final piece of that such that  
14 we can go forward.

15 Now with regard – we're in a situation now where we have many licensees  
16 trying to quickly develop fire PRAs to support implementation of NFPA 805 in  
17 advance of the fire PRA standard. Certainly, that's not the way we prefer to do  
18 business here. You'd like to have the standard first and then do the PRAs. So I  
19 think what we learned, again, trying to heed lessons learned from the past.

20 We're going to get insights out of the fire PRA development that's under  
21 way and the standard when it does come out is certainly going to add value in  
22 terms of the granularity and level of understanding. It may not change or at least

1 based on our experience with the internal events at power, it's not going to  
2 fundamentally change the insights we get, but it will improve the level of detail and  
3 granularity of the models. That will be an improvement.

4 Again, the bottom line here is the endorsement expectation and the  
5 implementation schedules for fire protection are really not in sync here. With that,  
6 I want to turn it back to Dick for our conclusion.

7 MR. ROSENBLUM: Thank you. On slide 22, I'm just going to make  
8 a couple of points. Our plants spend about 90% of their time at power. PRAs  
9 have shown that both for large early release and core damage, roughly 70% of our  
10 risk comes from at power. That's where we continue to want to focus our time. It's  
11 where we think the time ought to be focused and our attention.

12 Fire PRAs are a potential solution to a problem which has bedeviled both  
13 the Commission and the industry with the deterministic tools we have available to  
14 us today. It has the opportunity to lead us to a much better outcome and much  
15 better insight into fire issues. We think that's another area that the industry is now  
16 focusing and we need to continue to focus.

17 In the end, PRA is a long-term proposition. I left the nuclear industry for  
18 about 10 years to run a different part of our company and the change I saw over  
19 that 10 years was dramatic. Because when I left, to an extent, PRA was pointy-  
20 headed guys in the back room giving you the divine answer to your question.  
21 When I came back, maintenance people had embedded in their minds the lessons  
22 from the PRA in how they did their everyday life. It takes time for that to happen.

1           It takes experience and it takes continued work for the true value and the  
2           sophistication of PRA to serve the needs of the operating plants and our  
3           communities. We need to, as we go forward, make sure we don't forget one of the  
4           primary lessons of Three Mile Island; to focus on what's important, do not get  
5           diverted by technically interesting but very low significance issues. The tale of the  
6           curve is not where our focus needs to be. The high safety significance is where  
7           we need to continue to focus both as regulators and as the industry.

8           Industry thinks that 50.46 can fundamentally bring the regulatory  
9           underpinnings and foundation into a risk informed world and set forward for us in  
10          the future a way to rationalize many of the actions we're taking now with the  
11          regulatory underpinnings and we think that's an important item.

12          And finally, the risk informed tech specs add tremendous value in safety  
13          and in operation to the industry as a smarter, more sophisticated, more insightful  
14          way to operate our plants. Thank you.

15                   CHAIRMAN KLEIN: Thank you for that good explanation and  
16          background. I think a couple of Commissioners had a discussion this morning on  
17          50.46a so I know it's a lively discussion going on. We'll start our questioning with  
18          Commissioner Jaczko.

19                   COMMISSIONER JACZKO: I guess there's two comments I'd make  
20          very briefly and then I have a couple of questions. The first thing is I think –  
21          certainly, I think there's a lot of value to the risk insights and I think from some of  
22          the things you've said there's clear areas where this has been a useful tool and

1 given useful insight.

2           The crucial point to me that I think a lot of this is really the credibility and  
3 reliability of the models. The numbers that we get ultimately matter and I guess to  
4 some extent I've heard some things that cause me some concern, I think, in terms  
5 of resources and the potential resource challenges for further use and further use  
6 of risk informed regulation or risk informed activities in a way that further stresses  
7 the modeling resources and the modeling capabilities.

8           I certainly think that isn't the direction we should be going in. If we want to  
9 do more and more this we would clearly have to have the resources from a PRA  
10 perspective to do it. So fundamentally, I guess for me the biggest issues really  
11 come down to quality of the modeling and the quality of the models. I'm not yet  
12 quite convinced of the state of that enterprise yet.

13           One of the questions I have. First question is this chart you showed me on  
14 CDF versus capacity factor. Obviously, there are uncertainties in the CDF  
15 numbers. And I always get – when I was a graduate student, I used to teach  
16 science labs and the first thing you always taught people in a science lab was  
17 whenever you plot data, you've got to put errors down because that kind of is what  
18 matters in the end. I always get a little skeptical when I see numbers that have  
19 trend lines that go down on things that I'm not exactly sure what the error bars are.

20           Certainly, Mr. Rosenblum, you talked a little bit about some improvements  
21 in these numbers could be simply because we're narrowing the bands a little bit on  
22 the numbers on the modeling itself. As I said, I think this is an interesting chart,

1 but I'm not sure if it says much without knowing what those uncertainties are and  
2 what the uncertainties – if we're talking in 1992 the uncertainties bound the levels  
3 that we've gotten down to, I'm not sure that we've really achieved anything.

4 So I looked at what I think is a much more useful chart and this was in the  
5 EPRI policy statement and I think it's Figure 2 in there. I can't find it right in front of  
6 me with all my paper. Not on the EPRI policy, but on the safety study. There I  
7 think there's a much more useful chart that shows a reduction in safety significant  
8 events. There we're actually talking about data.

9 This number is a calculated number versus a calculated number. It's not  
10 necessarily that useful. I looked at that and that to me is much more significant in  
11 terms of showing that perhaps there's improvement. However, looking at other  
12 data, if you look just over the last four to five years, if you look at the plants that  
13 we've had in Column 3 and 4, we've roughly got about the same number of plants  
14 in Column 3 and Column 4.

15 On the one hand, we've got what appears to be this declining trend line in  
16 changing core damage frequency, yet on average we still have about the same  
17 number of plants, certainly discounting this year over the last four years. It's really  
18 been about the same. We haven't necessarily seen an improvement in  
19 performance there.

20 So I guess maybe perhaps there's a question in all of this. I guess that  
21 question would be fundamentally do you think we're at the limiting end here for  
22 what we can do in terms of ultimate plant performance? Have we gotten

1 everything we can out of the PRA from that perspective and are we always going  
2 to see about three or four plants in Column 4 and about four to five in Column 3?

3 MR. ROSENBLUM: That's kind of a long question. It is a long  
4 question and of course it's a difficult one because you're asking me to polish up  
5 my crystal ball and look into the future. I think the core question is have we gotten  
6 as much as we can get out of PRA? And my answer is no. I think there's more to  
7 be learned. It can be learned by a broader group of people.

8 My partners up here talked about the granularity of the PRAs. What that  
9 really means is we're answering much more detailed questions. We're answering  
10 questions not of what happens if a subsystem is not available, which is sort of an  
11 interesting question for an engineer, but the real world questions that the plants  
12 have and the operators and the maintenance people have of, "Gee, my automatic  
13 start is not available, but the pump can still start and I can do it manually". Really,  
14 how big a deal is that? So I can gauge what I ought to be doing to respond.

15 COMMISSIONER JACZKO: Do you think we'll eventually see that in  
16 trends with Column 3 that we eventually move away. We haven't changed the  
17 threshold for green to white to yellow determination. I would just naively expect  
18 that if you're seeing average core damage frequency go down, that we should be  
19 seeing fewer plants – ultimately which is kind of our way of judging safety – fewer  
20 plants moving in Column 3 and Column 4. That doesn't seem to have changed.

21 MR. PIETRANGELO: Maybe one reason is, and I hope we captured  
22 it in that SDP slide, is that again the threshold levels are at a pretty low level.



1 That's what drives the movement end of the column. You're within the uncertainty  
2 band of the PRAs, so maybe that's why we haven't seen any large reduction in  
3 plants moving that way because we are still in the noise level.

4 COMMISSIONER JACZKO: In terms of declining CDF average  
5 values, what are the uncertainty bands here? Is this trend a real trend? Are we  
6 within the uncertainty bands?

7 MR. PIETRANGELO: I'm going to ask Ken Canavan who's one the  
8 authors of the EPRI paper.

9 MR. CANAVAN: Ken Canavan with EPRI. Just real quick. The short  
10 answer to your question is "yes, it's a real trend". The uncertainties exist  
11 irrespective of the data that's used. The data that goes into these models is real  
12 data that comes from real equipment performance. So the short answer to your  
13 question is the uncertainty band probably hasn't changed, it probably moved with  
14 the trend.

15 COMMISSIONER JACZKO: But it's not big enough that the trend is  
16 a trend within the uncertainty bands. This is what I'm asking. Those uncertainty  
17 bands are narrow enough that you can see a trend in that data. I get a little bit  
18 uncomfortable because to some extent it's a self-fulfilling prophecy. We make  
19 plant changes based on what the models are telling us. So of course the models  
20 should show improvement because the changes we made have been based on  
21 what the models say the concerns are. But if fundamentally those models are not  
22 accurate, we may be changing things in a way that we are comparing the data to

1     itself. We're not adding new information necessarily.

2                   MR. CANAVAN: Actually, the model has changed very little. What's  
3     really changed these numbers is data.

4                   COMMISSIONER JACZKO: But the data changes because of what  
5     the model tells us to change. You do a PRA, you get PRA insights. It tells you a  
6     certain piece of equipment is risk significant from a PRA standpoint, so we make  
7     changes to the data based on the model.

8                   MR. CANAVAN: I think I understand what you're saying, but in  
9     reality what's happening is all those changes and insights aren't affecting direct –  
10    they're affecting a very small portion of the data. The data pool is very broad and  
11    wide, so it is actually a true physical trend of a very broad set of equipment; 1,000,  
12    2,000 components, all trending down and getting more reliable. So the short  
13    answer is it's a true trend.

14                  COMMISSIONER JACZKO: Thank you.

15                  CHAIRMAN KLEIN: Commissioner Lyons?

16                  COMMISSIONER LYONS: Thank you. Thanks to all of you for a  
17    very good briefing. I thought I might start my questioning on the general question  
18    that's certainly implicit in several of the comments; Tony in yours, probably in  
19    some of the others of you, but it also came up very strongly – it was a June 19th  
20    meeting, I believe, staff and industry also discussing PRA issues.

21                  The general question of the extent to which NRC staff can or should rely on  
22    plant specific PRAs as opposed to SPAR models. I guess I'm very torn on that

1 point because on the one hand I do recognize that the Commission and the staff's  
2 suggestions to industry to improve the quality of the PRA models certainly implies  
3 that there should be greater use, greater attention paid to them. That to me is  
4 very, very logical.

5 But I also see a pretty substantial host of challenges if the NRC agreed  
6 tomorrow to use plant specific PRAs. I noted out of the June 19<sup>th</sup> meeting that  
7 there are plans for a workshop on that in the future between staff and industry. I  
8 think that could be very, very useful. Some of the kinds of questions I have and  
9 then I'd be interested in any of your comments on this, too.

10 It seems to me that it is important that our staff have models that they can  
11 run, that they can run on our systems, that they have in that case unfettered  
12 access to the codes; under appropriate circumstances they could be subject to  
13 FOIA. And these all strike me as substantial challenges with the use of the plant  
14 specific PRAs.

15 I'm certainly no expert in this, but I gathered that there's enough variability  
16 in the way the plant specific PRAs are constructed that it would be quite difficult for  
17 our relatively small staff to embrace and understand all the variations in the plant  
18 specific PRAs. All I'm doing really is sharing my confusion.

19 On the one hand, I think it would be certainly advantageous for us to take  
20 more benefit, more use of the plant specific PRAs, but I also see the substantial  
21 challenges. I realize you've got the workshop coming up, but could you add any  
22 comments on this?

1 MR. PIETRANGELO: We had an excellent discussion on this. The  
2 was the meeting of our working group with the PRA Steering Committee. The idea  
3 we were discussing was the use of licensees' models in the SDP process as a  
4 way of trying to eliminate at least a little bit of the differences we see in the  
5 green/white determinations. We use the SPAR model; you get a number like two  
6 times 10 to the minus six. Then you use the licensee's model and you get nine  
7 times 10 to the minus seven. You're on either side of the line. Everybody knows  
8 it's the same number and then we start spending more resources trying to figure  
9 out which side we're on.

10 This is kind of the de minimis risk evaluations we're talking about that really  
11 weren't intended by the initial process at all. So we thought using one model that  
12 met the Commission's standard at least for quality should be the model of record  
13 for that as a way of at least taking one of the areas of uncertainty out of this.

14 Quite frankly, I don't think this proposal is going any place fast. It was clear  
15 to me that the staff was not in favor of this approach. We're a little frustrated with  
16 the SDP process. It works better. It's an improvement over what we had, but I  
17 think Greg would tell you Exelon spends 30% of their PRA resources doing SDPs.  
18 You can't take a pitch. You've got to evaluate every one. At this low level  
19 threshold in the uncertainty bands and with one white moving you over, that's why  
20 it gets a lot of attention.

21 Our first take on this is acknowledge it's risk based and maybe we should  
22 add the numbers; maybe we should add the whites together to see if they cross

1 the yellow/white threshold as a way of at least taking some of the pressure off  
2 having to look extensively at every single one of these things.

3 So we're open to suggestions. We see it as a resource issue. That's why  
4 we raised it today and in terms of how our infrastructure is challenged in this area  
5 it's a diversion on a de minimis risk evaluation that's not helping.

6 COMMISSIONER LYONS: Anyone else want to comment?

7 MR. ROSENBLUM: I'd like to add something. I was the industry  
8 push for this. I did it primarily because it shifts both the plant and the regulator  
9 from talking about what can be meaningless differences in numbers to talking  
10 about what are the underlying issues, causes and corrective action and how broad  
11 are the problems and puts our site exactly where it ought to be.

12 The issues you talked about, about the difficulty of moving it forward I think  
13 are exactly the right issues. They're going to be tough issues. I personally believe  
14 we ought to go down that path and see where the issues stop us because they're  
15 insurmountable; not shy away from the challenge. It's worth pursuing to see if we  
16 can get there because fundamentally it directs us to the right questions and the  
17 right use of our resources.

18 COMMISSIONER LYONS: I guess what you're hearing from me is  
19 strong encouragement of the process between staff and industry to proceed in this  
20 area. You've accurately described significant benefits that could come out of it  
21 and you also agreed that I described some substantial challenges. To me that's  
22 not a reason to give up, though. So I guess my time is up.

1 I would just encourage that those discussions continue to the extent we can  
2 find – I don't even know; I hate to call it a middle road, I don't think its close  
3 enough to know where the road is. I do think it's an important journey and it could  
4 have some important benefits, I think certainly to us, certainly to you.

5 CHAIRMAN KLEIN: Thanks. I think the concept of risk informed  
6 performance based is clearly a good way to go. I think it's one in which I certainly  
7 support the concept. You mentioned in your comments about the Three Mile  
8 Island event where the structure tells you where to focus. I think what's  
9 encouraging is that in general we don't have a conflict, that it basically helps both  
10 your safety and your performance. It's nice to have one that's a win/win as  
11 opposed to one side wins and one side loses. I think that's a good characteristic.

12 I think the concept is good. I think what you'll probably hear is how do we  
13 go forward? Where do we invest the resources to get the maximum input and  
14 what does it tell us? A couple of questions at a more generic level.

15 Mark mentioned in your slide 12 and Tony mentioned in his summary  
16 comments that you'd like some guidance from the Commission in terms of a  
17 signal. What signal are you looking for?

18 MR. McBURNETT: Looking to continue to emphasize the importance  
19 of risk informed applications and moving ahead with providing the resources and  
20 time and energy to further the process.

21 MR. PIETRANGELO: Said in another way, if it takes another seven  
22 years to do the next initiative 4b, you're not going to see a lot of people do it. I

1 mean, we've got standards now. We've got a Reg Guide that endorses it. That's  
2 supposed to streamline the process. We think the initiatives have a safety benefit  
3 and they need to be processed effectively and efficiently. We have the tools to do  
4 that now. That's what we meant by support.

5 CHAIRMAN KLEIN: One of the – obviously, we've got three utilities  
6 here and any time that you have Exelon in the room, you have a lot of plants. But  
7 in terms of what's the sentiment of industry overall? You're three. Is industry  
8 putting enough resources into this area?

9 MR. ROSENBLUM: It's difficult to speak for industry on the whole,  
10 but I'll give it a shot. I think the industry is putting a lot of resources here, but we  
11 would be foolish to not believe that PRA doesn't compete for all the rest of our  
12 priorities and resources. There are many, many issues in the plants. Is it  
13 enough? Personally, I have encouraged the industry to put more focus on the use  
14 of PRA in our plants and to be more aggressive in pursuing a number of the  
15 initiatives.

16 I think it's a site by site determination of where they perceive their  
17 improvement is, their bang for the buck is highest. As an industry as a whole, I  
18 think we're putting about the right amount of emphasis on it, but as has been  
19 mentioned here, it's going to get harder and harder. People are becoming  
20 scarcer. They're becoming more expensive.

21 We had the interesting experience of losing some people to the tire  
22 industry, which is now using PRA as they look at what their risks are. So it's going

1 to be harder and harder to sustain the level of focus and level of effort we have  
2 right now. I believe as the industry sees that the Commission is strongly behind us  
3 and is strongly aligned to it, the industry will also continue to devote resources and  
4 an appropriate level of resources.

5 CHAIRMAN KLEIN: I think one of the issues from our perspective  
6 and it will come as no surprise to Tony, but the industry supports 90% of the  
7 NRC's budget. Therefore, we need to look at signals from industry as to where do  
8 we allocate resources because we also have to make trade-offs. And so it's one in  
9 which we – while you say that you want to see signals from us, we need to see  
10 signals from the industry as well.

11 MR. ROSENBLUM: I would like to respond to that for a second. I  
12 think that's obviously correct, but from the position of a CNO, it's very difficult for  
13 us to allocate resources speculatively. And until we know that the Commission is  
14 going to be pursuing something and in some cases is taking a leadership role and  
15 moving initiatives down the road that the industry is interested in and devoting  
16 resources to it, then from our perspective we're putting resources into something  
17 that's entirely speculative versus something that we know we're going to get a  
18 return on.

19 There really is a partnership here and I think we're going to have to work  
20 together and be sensitive to the signals we send each other.

21 CHAIRMAN KLEIN: We're going through this minor process now of  
22 looking at an '09 budget, so where we allocate resources impacts us as well.



1 Commissioner McGaffigan?

2 COMMISSIONER McGAFFIGAN: Could I clarify before we start?

3 Are we going through a second round with these folks?

4 CHAIRMAN KLEIN: I think we will.

5 COMMISSIONER McGAFFIGAN: Good. I haven't lost time asking  
6 that question. Tony, I've been here long time and it's not surprising to me that you  
7 brought Southern California Edison and South Texas with you because I've always  
8 had – I learned probably two or three years into my tenure that they were the very  
9 best in terms of the quality of their PRAs and the investment they had made in it.  
10 I'm glad that Exelon has caught up.

11 We continue to have a feeling among the staff – it was reflected in the  
12 paper that came to us about the annual review of the reactor oversight process  
13 that among the people we internally poll, there's significant concern about quality  
14 of PRAs. That may come from the MSPI stuff. It may come from other things.

15 Help me, aside from these folks at the table, there are continual anecdotal  
16 tales, particularly – you yourself told us that you were surprised at some of the  
17 language in the industry kept the MSPI from being implemented at least three  
18 months.

19 How widespread – it's really the same question the Chairman asked – how  
20 widespread is the real interest in this and should we be doing things like we did  
21 with South Texas on two occasions now, the 50.69 predecessor exemption, this  
22 effort that was described, maybe we should just work with the folks who have

1 really good PRAs and do what we can with them and not try to bootstrap everyone  
2 else because if what I understand happens in the process of coming up with the  
3 standards, it's the laggards who keep this stuff going for years and years getting  
4 the standard.

5 MR. PIETRANGELO: Let me address the first part of your question.  
6 First of all, while South Texas and San Onofre have excellent PRAs and people  
7 who work at the stations, they're not alone. To suggest that they are leading the  
8 industry, they are industry leaders, but there's a lot of others, too. I almost  
9 purposely didn't want to bring representatives so you wouldn't ask that question.

10 Dick chairs our working group and South Texas was a pilot on a very  
11 important initiative, so they're here. But back to your real question about  
12 industry-wide quality of PRAs. Every PRA in the industry has been peer reviewed  
13 at least once. I think applications like maintenance rule A4, like MSPI, like some  
14 of the other tech spec initiatives drive improvements to the models. If you're not  
15 using the model, there's no reason to improve it.

16 COMMISSIONER McGAFFIGAN: That has been my approach here.  
17 Maintenance Rule A4 was a big deal and these guys have the monitors that can  
18 be looking –

19 MR. PIETRANGELO: Lots of people have monitors, Commissioner.

20 COMMISSIONER McGAFFIGAN: You told us back in '98 don't make  
21 everybody have monitors because we had to have flexibility. So we didn't.

22 MR. PIETRANGELO: In fact, the maintenance rule doesn't even

1 require a PRA, but every licensee uses the PRA to do maintenance rule A4, even  
2 though there's no requirement.

3 COMMISSIONER McGAFFIGAN: Okay.

4 MR. PIETRANGELO: Back to the answer, we've all been peer  
5 reviewed. We've got a standard now so there's a common terminology and target  
6 to shoot at. We're continuing to do applications. That's why these tech spec  
7 applications are so important. It gives people another reason to invest in the tool  
8 to the level of granularity and quality they need to be able to do those initiatives.

9 And really from where we started, back to the historical perspective, we  
10 were doing kinds of 'onesies' and 'twosies' back in the mid 1990's on tech spec  
11 initiatives. These bigger applications, we've always said the PRA quality has to be  
12 commensurate with the application. Well, when you get an exemption from 11  
13 different special treatment requirements or you have an alternative to the  
14 completion times in the tech specs or the surveillance test intervals on the tech  
15 specs, you better have a really good PRA that meets the standard. They do and  
16 some of the other pilots do. So now we've got the target to shoot at and it's not so  
17 much of the –

18 COMMISSIONER McGAFFIGAN: I'm trying to do the same thing the  
19 Chairman did in his last question. We're working on budgets. We're trying to  
20 figure out priorities. Reading your testimony and something we haven't discussed  
21 in detail in this first round, it looks to me like the most important thing is to get fire  
22 PRA right and to be able to proceed on NFPA 805 in a rational framework

1 because there's such wide interests in the industry. I'm not trying to put words in  
2 your mouth, but am I reading you right that that is a very high priority for limited  
3 resources?

4 MR. PIETRANGELO: When resources are scarce you have to  
5 prioritize and fire is a top industry priority.

6 COMMISSIONER McGAFFIGAN: Is *a* top or *the* top.

7 MR. PIETRANGELO: We also want to meet the level one internal  
8 events. You kind of need both to do fire. You have to do both. So those are our  
9 two.

10 COMMISSIONER McGAFFIGAN: When do we get to the rest?  
11 Seismic?

12 MR. PIETRANGELO: We get to them when we get to them. It's a  
13 long-term proposition. I don't know what I'd do, quite frankly, what can a licensee  
14 do with the seismic PRA in terms of some of the applications? We haven't used it  
15 in any application yet.

16 COMMISSIONER McGAFFIGAN: It might not hurt to have when  
17 questions come along after Japanese events. Is the U.S. better or is the U.S.  
18 worse than others?

19 MR. PIETRANGELO: Even shut down risk. One of the things I  
20 worked on when I came to work in D.C. was the shut down risk. We had so much  
21 operating experience from events past, we knew how to develop the guidelines  
22 and what the higher risk evolutions were. Now PRA comes along and confirms

1     them, but we already knew them.

2             The insight Dick gave you from diesel overhauls from outages to online.  
3     You didn't need a PRA to tell you that. There's some pretty basic insights you can  
4     get and the PRA really confirms that in addition to giving you something where if  
5     you move something over here, you can see the effect over here. That's the real  
6     value of the tool.

7             COMMISSIONER McGAFFIGAN: So you want the SRM from this  
8     meeting to change whatever SRM currently tells the staff to try to have  
9     comprehensive PRA models or standards in place by the end of 2008 and say that  
10    that Commission was overly ambitious and we hereby let you off on everything  
11    except fire and internal events? I just want to clarify.

12            MR. PIETRANGELO: Long term, integrated is the way to go, but the  
13    priorities now are meeting the Reg Guide Rev 1 that just came out and getting  
14    those fire PRAs developed in a way we can use them to support 805. That's the  
15    two priorities.

16            COMMISSIONER McGAFFIGAN: Mr. Chairman, I'm finished for this  
17    round.

18            CHAIRMAN KLEIN: Commissioner Jaczko?

19            COMMISSIONER JACZKO: I have a brief comment on the  
20    discussion on the SDP. Sometimes I like to try and solve problems in the easiest  
21    way. We go back and forth on the SDPs. I think there's an easy way to not go  
22    back and forth, which is to not go back and forth.

1           We have two numbers. We are not a risk-based agency. We take the  
2 higher number. If it gives us a white finding, it gives us a white finding. White  
3 findings are low safety significant findings. That's what they mean. I get frustrated  
4 –

5           COMMISSIONER McGAFFIGAN: What they are saying is you're one  
6 step if you get a second white; you're one step from being in Column 3.

7           COMMISSIONER JACZKO: Absolutely, but that's the way the ROP  
8 is set up and that's perfectly acceptable. That's the way it was designed. That is  
9 not a reason why we're arguing and taking so long with the SDPs. The reason  
10 we're taking so long with the SDPs is because you don't want white findings. I  
11 look at that and I think the solution to that is to improve plant performance so that  
12 we're not in the margins on that white boundary or the white to yellow boundary.

13           Again, I think the problem is, quite frankly, is it is too risk-based and the  
14 reality is we have two numbers. If you're number doesn't agree with ours and  
15 they're within the errors of these two things, then we take the higher number or  
16 average them or whatever. I think that there's a way to accomplish that and to  
17 move the SDP process forward.

18           I think part of it is a concern with white findings and multiple white findings.  
19 That's the way the ROP is set up. Now we can go and overhaul the ROP, but that  
20 still wouldn't get at the problem of how we deal with these findings. I actually have  
21 a question, so I want to get to my question. It's not on this.

22           CHAIRMAN KLEIN: You only have one minute and five seconds.

1                   COMMISSIONER JACZKO: I guess this isn't really a question, but  
2   it's a different topic. I'm not so sure, again, fire PRA I think from our perspective in  
3   looking at resources, we're in good shape, I think, from an agency standpoint from  
4   my understanding. We've done a lot of work in the last two years with EPRI, with  
5   NIST to develop very good fire models. I think its four different models that are  
6   applicable in a range of situations and depending on what level of detail is needed.

7                   So when Commissioner McGaffigan makes the point maybe we need to  
8   look at some of these – I certainly don't think that from an agency budget  
9   perspective we need to do a lot more or we need to dump a lot of resources into  
10   the fire PRA. I think we're moving forward at a good pace. It seems like the work  
11   needs to be done on the industry's side.

12                  It gets me back to the point that I made earlier that on the one hand what  
13   we hear is more things need to be risk informed. We want to do 50.46a and we  
14   also hear that we're not there with the models and don't make us get the models,  
15   the kinds of models that we'll need to do more sophisticated PRA work in the  
16   future.

17                  Fundamentally to me this comes down to the fact that I need to see more  
18   from your end about getting these models done before we do more and more work  
19   on a regulatory side to put in place new regulations that require more and more  
20   burden on the models if the models aren't really there yet. It seems like that's the  
21   first thing that needs to get done is the models. It seems like that is a long-term  
22   trend or long-term process on your part, which is acceptable. I don't think there's a

1 problem with that.

2 I think it's unfortunate because I think we can get a lot out of these things.  
3 Fire PRA from an agency perspective and perhaps when the staff panel is here,  
4 we're in pretty good shape from where we are and I don't think from a research  
5 standpoint and maybe from NRR standpoint we need to do a little bit more work on  
6 that. But I think we are in good shape there. Again, there wasn't a question there.

7 COMMISSIONER McGAFFIGAN: Tony should answer that last  
8 point. Are we close on having a fire PRA that could support the license  
9 applications for NFPA 805?

10 MR. PIETRANGELO: Is who close?

11 COMMISSIONER McGAFFIGAN: The combined group of people  
12 who have to get close. The folks who – we are told by the 1996 act – I forget the  
13 name, but it was done by the Commerce Committee – to rely on consensus codes  
14 where possible. We are involved in the consensus code bodies. You're involved  
15 in consensus code bodies. When is there going to be a consensus code for fire  
16 PRA? Is this the standard?

17 MR. PIETRANGELO: I'll let the code folks answer that, but just back  
18 to your point. There was a joint effort between EPRI and the Office of Research to  
19 develop NUREG 6850 on fire that's really the baseline for the models that are  
20 being developed now. That was input into the standards development process.  
21 So hopefully we're going to be pretty consistent with what was developed earlier  
22 and not change it a lot. The process can take you anywhere.



1                   COMMISSIONER JACZKO: Looking at it from a resource  
2 perspective from the agency, and again maybe the staff can answer this. I don't  
3 get a sense that we're under budgeting and under resourcing in this area from an  
4 agency perspective.

5                   MR. PIETRANGELO: I can't answer that.

6                   COMMISSIONER McGAFFIGAN: We may be over budgeting – I  
7 think we're fully budgeted for as many PRAs, as many NFPA 805 applications as  
8 you all are telling us that are going to come in in 2009. That's a big number, I  
9 think. We'll have too much in a way of licensing resources if they don't come in.  
10 Are they going to come in or is this getting the right standard going to hold it up?

11                   MR. PIETRANGELO: This is a broader question because the  
12 standard development process as you said includes the NRC. It includes industry,  
13 other folks. You mentioned the law that says the NRC should take a consensus  
14 standard and go with it. We have a Reg Guide process; that's kind of another bite  
15 at the apple on the standard.

16                   In many ways, it's good because at least with the ASME standard it allowed  
17 a five unit pilot program to really road test the standard which the staff observed,  
18 did their own visits. It just takes time. Or you could say issue the standard and we  
19 are not going to do the Reg Guide or the pilot and we're going to go with what  
20 we've got for the application using the insights we have at the time and go forward.

21                   And then let the rest of the process play out over time and hopefully not  
22 change everything you just did. But if you want to get it done quickly, I think that's

1 the quicker approach.

2 COMMISSIONER McGAFFIGAN: The fire PRA standard is how  
3 close?

4 MR. PIETRANGELO: I believe it's supposed to be issued by the end  
5 of this year, but the folks will correct me if I'm wrong. You could simply endorse it  
6 at that time without the process we went through on the ASME internal events  
7 standard. That's probably the only hope of meeting the 2008 expectation. The  
8 other process takes time.

9 COMMISSIONER JACZKO: Is there anyone from the staff – can we  
10 get someone just to comment on that while we're on this discussion.

11 MR WEERAKKODY: I am Sunil Weerakkody, Branch Chief of Fire  
12 Protection. We've got 42 plants right now implementing 805 including two pilots.  
13 You mentioned a couple of key documents Commissioner Jaczko, NUREG-CR-  
14 6850 and several other NUREG-1824, which form the fundamental technical  
15 acceptance that the staff is happy with. I know we talked a lot about the standard,  
16 but if somebody would ask me are there things out there that the industry can use  
17 to give the NRR the reasonable confidence, my unambiguous answer would be  
18 yes.

19 COMMISSIONER McGAFFIGAN: Today?

20 MR. WEERAKKODY: Yes, today. However, though, the two pilots  
21 are very, very actively using NUREG CR-6850 to trial and test run. We are finding  
22 little gaps here and there and we are working it through. Our optimal solution is if

1 you follow the existing process we have already followed is to get the industry  
2 standard by the end of the year, endorse it with the Reg Guide and then have the  
3 licensees, the non-pilot, simply meet those things so that the staff can have very  
4 little effort to review them.

5 Realistically, though, what has happened is a couple of times the ANS has  
6 been slipping and I've been talking to my boss, Mark Cunningham, because we  
7 don't want to put the industry in a bad place where they can't close out their fire  
8 program because of the standard. We are – right now I'm talking with Mark,  
9 what's the alternative if the standards skip again?

10 I think Tony made one proposal that we should consider. But I think the  
11 main point is – then there's another thing we are doing. In fact, we'll be coming to  
12 the Commissioner within the next few months with a proposal because the  
13 industry has a legitimate concern that there's a lot of fire PRA resources needed  
14 and to give some relief on the discretion in terms of when this is coming and right  
15 now we have them coming in 2008 and late 2008. We have 17 of them. We're  
16 trying to give the industry some relief there.

17 CHAIRMAN KLEIN: Commissioner Lyons?

18 COMMISSIONER LYONS: Two quick comments and hopefully a  
19 couple of questions. I started the first round jumping right in on the plant specific  
20 PRA issue. I never really made the point as the Chairman clearly did, I too  
21 strongly support risk informed regulation. If you're looking for a Commission  
22 endorsement on the importance of PRAs and risk informing, please count me in.

1           Another comment. I find your suggestion on perhaps adding white findings  
2 as opposed to counting two white findings; I find that to be a very interesting  
3 proposal. I hope that in the course of the working group that comes up, that's  
4 considered. At least it made sense to me when you said it.

5           Questions. Both Tony and Dick referenced 50.46 and referenced the  
6 strong industry interest in it and Ed already spilled the beans that two of us spent  
7 all morning on that with a large number of staff. I'm just curious if you would  
8 comment on how you see 50.46 most useful to industry, whether it is from the  
9 perspective of improved safety, opportunities for improved safety, or uprates since  
10 they've both come up.

11           MR. ROSENBLUM: I'll start and then I'll ask Tony to weigh in, too. I  
12 think it has the biggest value in harmonizing the regulatory base we operate with.  
13 That's my simplest way of saying it. We have a regulatory base that looks largely  
14 at risk, but in one area, the ECCS acceptance criteria, we have a completely  
15 deterministic base that tends to drive the industry to – I don't want to use the word  
16 I was going to use, so I won't – to confusion about what really is the right thing to  
17 do.

18           I don't believe you will see as a result of 50.46 changes a massive rush to  
19 the door with licensee amendments in hand. What you're going to see, I think  
20 over time, is an increasing use of that harmonized base to understand where to go  
21 with our plants. I don't see people running in with lots of uprates. I just don't  
22 believe that will happen.

1           We don't have the resources. It's not the most productive use of our  
2 resources. But the inconsistency in the underlying regulatory base for all of our  
3 plants causes confusion and causes a bifurcation of how we apply our resources  
4 in many cases that can only be harmonized by the new 50.46a look at the world.

5                       MR. PIETRANGELO: The other point I'd add and Commissioner  
6 McGaffigan you will remember this part, this was borne out of SECY-98-0300.  
7 This was Option 3: risk informing the technical requirements in 10CFR50. We had  
8 a fairly minor change to 50.44, the San Onofre pilot on hydrogen recombiners,  
9 which was viewed as almost too little to even challenge.

10           But if you really – unless you wanted to have 50 different rulemakings, the  
11 fastest way to risk inform the technical requirements in Part 50 is by risk informing  
12 the mother of all assumptions behind those technical requirements and that's the  
13 double ended instantaneous break of the largest pipe in the reactor coolant  
14 system.

15           The other part of the policy decision at that time by the Commission was we  
16 had an ROP going forward that was risk informed on the back end, at least with  
17 the significance determination process in some of the looks at inspection, so it was  
18 recognized that if there wasn't something that risk informed the underlying  
19 technical regulations, you would have this gap between the ROP and the Part 50  
20 regulations and then Option 3 was supposed to close that gap.

21           If we don't move forward with 50.46a, it's basically an acknowledgment that  
22 we're going to live with that gap going forward ad infinitum. That was one of the

1 main rationales for going forward with that.

2 It's taken a long time. Research has done an extensive job on this. They  
3 had a lot of interaction with the rulemaking folks here and with NRR and there  
4 would be a lot of guidance that would need to be developed as a result of it, but it  
5 was really supposed to be an enabling rule, as Dick said, to harmonize the design  
6 basis with risk insights. That's the fundamental improvement that 50.46a offers.

7 COMMISSIONER LYONS: Not for BWRs?

8 MR. PIETRANGELO: There's some work to do on BWRs. I'll  
9 acknowledge that.

10 COMMISSIONER McGAFFIGAN: Literally none of them.

11 COMMISSIONER LYONS: Those we're very interesting answers. I  
12 appreciate it. I do not have time for another question.

13 CHAIRMAN KLEIN: You can always ask the staff.

14 COMMISSIONER McGAFFIGAN: And force these guys to come to  
15 the table.

16 CHAIRMAN KLEIN: As indicated, we do as an agency have a lot of  
17 things on our plate and we do have to make choices. Where do we put both  
18 people and attention? So I guess I'd like to hear from Tony first and then from the  
19 people that have to run plants second.

20 What are the top three things that we need to do to move the issues  
21 forward on risk-based, risk informed performance based? What are the top three  
22 things that we need to do to really make a difference to move the issues forward?

1 MR. PIETRANGELO: I think we want to build on the success of the  
2 tech spec initiatives. We want to kind of get into a production mode on those, if  
3 you will. If someone comes in with a PRA that meets Reg Guide 1.200 that should  
4 take the quality issues off the table and focus solely on the application.

5 We see a lot of benefits in 4b and 5b. It took a long time to develop  
6 them, so we would like to see the Commission move forward with an effective,  
7 efficient process for the processing of those amendments that are going to come  
8 in.

9 You heard South Texas is getting ready to do 5b and others will as well. I  
10 think we've got some others looking at 4b very closely and Exelon is going to apply  
11 5b across their fleet. You're going to see a lot of these soon.

12 I think the second one is, again, we would like to see the Commission move  
13 forward on 50.46a. It's really very important. It kind of underscores the whole risk  
14 informed performance based concept that was in the policy statement in '95 that  
15 went into the ROP and really needs to follow through on the regulations.

16 Third, SDPs. Thank you, Dick. It's not the outcome that's wrong, it's just  
17 trying to make that process more efficient and effective.

18 COMMISSIONER JACZKO: That's what I offered the solution to.

19 MR. PIETRANGELO: We won't do any analysis. There's reasons  
20 why people do analysis and we've made some recommendations. Just let me  
21 counter this with MSPI, which is kind of risk-based, but we put some qualitative  
22 considerations in. There's a risk cap on MSPI. There's a performance based

1 threshold on MSPI. And there's a rule that you can't change the PRA in the  
2 quarter in which you're reporting. It has to go in after you've submitted the data.

3 We need something akin to that on the SDP so we're not spending man  
4 years and six figures on green/white findings, tying up the SRA time in the regions  
5 and our PRA resources on it. It's not the outcome necessarily; it's the process to  
6 get there.

7 COMMISSIONER JACZKO: That's what I thought I fixed.

8 MR. PIETRANGELO: We're in agreement.

9 CHAIRMAN KLEIN: You were talking like a physicist instead of an  
10 engineer.

11 COMMISSIONER JACZKO: That's probably true.

12 CHAIRMAN KLEIN: Any comments from those that make electrons?

13 MR. ROSENBLUM: I would just reiterate what Tony said, but  
14 particularly with an emphasis on working on the SDP. It is hard. It's going to be a  
15 trouble strewn path to find a way to improve that process and use common  
16 models. There is a very, very high reward at the outcome if we can find a way to  
17 do that.

18 The SDP process is fundamentally the sieve we use on both sides to  
19 separate the wheat from the chaff. To know what's a big deal and where we really  
20 have to focus senior management and other attention and if it's giving us the  
21 wrong answers, we're putting our attention in the wrong issues. That's a very big  
22 deal for the safety of our plants.



1                   MR. McBURNETT: I'd say Tony has list of the right three. Top of my  
2 list would be 50.46. We've been in an industry leader position on that. Not that we  
3 have any particular application that we're pushing it for, but we just believe it's a  
4 fundamental change to the regulatory base. It's important to allow us to go  
5 forward in the future.

6                   CHAIRMAN KLEIN: So you have the same top three, just different  
7 order.

8                   MR. McBURNETT: Yes.

9                   CHAIRMAN KLEIN: Thanks. Commissioner McGaffigan?

10                  COMMISSIONER McGAFFIGAN: I'm shocked that NFPA 805 is not  
11 on that list and having an efficient and effective process for the handling of the 50-  
12 odd folks that have indicated that they're going to come in. If I were on your side  
13 of the table, that's upon us. It will fix this problem we've had since the early '80s.

14                  I think it was around 1980 we did the major change in fire protection. The  
15 industry brought us to the Appeals Court. In front of the Appeals Court we said  
16 we're going to give out exemptions like candy. They said okay, if you're going to  
17 give out exemptions like candy, then I guess its okay. We proceeded to give out  
18 exemptions like candy. The only way we are ever going to rationalize this is to do  
19 NFPA 805. I'm a little surprised that that's not one of the top three.

20                  MR. PIETRANGELO: It could be in there. Give us four. Let me just  
21 caveat that with your reciting of the history is very accurate, but it's really kind of  
22 an unknown commodity right now. That's why we're paying very close attention to

1 these first two pilots and how they do because PRA is complex. It's got a lot of  
2 moving parts. Fire protection is complex and now you're putting two those  
3 together as your silver bullet. We kind of don't know what the outcome is yet until  
4 we see it done in the pilot. I can't overemphasize the importance of the pilots.

5 COMMISSIONER McGAFFIGAN: On the issue that seems to be on  
6 everybody's list and I don't have a problem with it, the SDP thing. I will tell my  
7 colleagues that I was troubled early on in certain cornerstones. This isn't a  
8 problem everywhere. It's a problem in a couple of the cornerstones where we can  
9 use these very precise calculations.

10 We inevitably, because you get to white with the second thing, the second  
11 event, it sets up this inevitable game playing of whether it's 1.1 times 10 to the  
12 minus six or there's .9 times 10 to the minus six. That's not useful. I think I agree  
13 with those folks and like Commissioner Lyons, I'm not sure I'd want an infinite  
14 number. You get the nine 1.1's and you might have a problem if you come up with  
15 nine 1.1's and you still haven't tripped.

16 I think changing the structure there makes some sense. I think there are  
17 other problems in the SDP process in some of the areas like emergency  
18 preparedness and whatever; it's very hard to risk informed, but that's an issue for  
19 another day. You're talking only about certain cornerstones where a lot of your  
20 people can do calculations and battle with us.

21 I'm also with Commissioner Lyons on we have to make the investment in  
22 our SPAR models. I think we have to make the calls ourselves. In the case of

1 Yucca Mountain, DOE has this enormously complex TSPA model and we have a  
2 TPA model which is a baby model which we think is going to be good enough for  
3 us to make our regulatory decisions, but we have to make regulatory decisions  
4 based on our own products.

5 We can't rely on applicant's products, I don't believe, without questioning  
6 us. 50.46 could be the – as Commissioner Lyons and I discovered this morning  
7 and the relationship between 50.46a and 50.46b which is going to be a mandatory  
8 rule and whether those have to finish at about the same time could be a very long  
9 discussion and we probably can't enter into it because we spent about two hours  
10 on that issue.

11 I wouldn't be as optimistic that you're going to get that done in a short  
12 period of time nor do I believe you necessarily need to get that done in a short  
13 period of time compared to rationalizing SDPs, building on the tech spec initiatives  
14 and making sure that this enormous effort that we're about to enter into based on  
15 NFPA 805 and the Commission's rule change a few years ago is successful.

16 If it ain't successful, then we'll all regret it in 2013 or whoever's around here  
17 in 2013 will regret it.

18 CHAIRMAN KLEIN: Thank you very much. I think in the elements of  
19 time we have two more panels yet to go. You can tell this has a lot of interest and  
20 I appreciate your participation. Thanks.

21

22

PANEL 2 DISCUSSION

1  
2 CHAIRMAN KLEIN: Obviously, you can tell that this is a subject that  
3 has a lot of interest, so we're looking forward to hearing from ASME. Ken, do you  
4 want to start?

5 MR. BALKEY: Thank you Chairman Klein and good afternoon to  
6 your fellow Commissioners. On behalf of ASME's Nuclear Codes and Standards,  
7 we thank the Commission for giving us the opportunity to meet with you this  
8 afternoon to specifically address PRA and other related standards.

9 I am Ken Balkey. I am the Vice President of ASME's Nuclear Codes and  
10 Standards and I also chair ASME's Board on Nuclear Codes and Standards and  
11 I'm joined here today by Mr. Kevin Ennis, who is an ASME Staff Director for  
12 ASME's Nuclear Codes and Standards and Mr. Rick Grantom, who chairs our  
13 Committee on Nuclear Risk Management. This is really the technical group that  
14 pulls the standards together.

15 And I should mention that Rick is also a manager of risk management at  
16 South Texas and I'm a consulting engineer at Westinghouse in our engineering  
17 services organization. Rick and I are both senior volunteer leaders to ASME and  
18 Kevin is an ASME employee in New York City.

19 Our nuclear codes and standards are developed by 900 volunteers using a  
20 formal consensus process that's established by the American National Standards  
21 Institute and we get input from key stakeholders from all around the world  
22 including the NRC staff and that NRC staff support and contribution is actually a

1 very key element to success of development and acceptance of those standards in  
2 the industry, not only in the U.S. but around the world.

3 I really would like to thank the Commission and the staff at this time for their  
4 continued support of our ASME nuclear codes and standards activities. My next  
5 statement – hopefully there's nobody in the room that goes back when I say that  
6 our consensus standards go back to 1884 – where we developed our first  
7 performance test codes for boilers, but I think everyone is very aware that the  
8 beginning of 1914 we issued the first ASME Boiler and Pressure Vessel Code that  
9 is used here and also in a hundred countries for many industries and it actually  
10 eradicated a very serious problem 100 years ago where we were having boiler  
11 explosions on a daily basis.

12 The consensus process that we used to build that is an underpinning that  
13 we've used for 95 years and we use it in developing our PRA standards as well.  
14 With that experience, we believe that with that much use around the world that we  
15 have fairly good handle on what's efficient and effective to develop, implement and  
16 maintain the standards and some of those questions just came up in the industry  
17 presentation. We'll try to address those.

18 We feel like we have a sense of what works and what doesn't work and  
19 when you use standards to stabilize particular applications. The Committee on  
20 Nuclear Risk Management is our newest group that was formed in 1997,  
21 specifically to develop the internal events PRA standard. Next slide, please.

22 As Tony Pietrangelo mentioned our ASME standard for PRA for

1 applications was first issued in April 2002 and it specifically addresses internal  
2 events at power for level one core damage and large early release frequencies  
3 that I think everyone knows as LERF. The purpose of that standard is really to  
4 provide requirements to judge the technical adequacy or the quality of the base  
5 PRA at power to support risk informed applications.

6 So in practice, the standard is used to ensure that decisions that are made  
7 using risk information has a level of technical adequacy that's commensurate with  
8 the decision being made.

9 In going back, looking back at the last 95 years or so, standards really  
10 reflect the agreement across the industry and the stakeholders on products,  
11 practices and operations. In many cases standards are developed after there is  
12 early introductions of a product, practice or operation.

13 Now with our PRA standard there was a significant amount of time spent  
14 because a lot of work already had been done in building PRA models beginning  
15 back with Generic Letter 8820. So in effect, we were kind of back fitting  
16 developing a standard after significant work was already done and we ended up  
17 spending a lot time trying to come up with a set of requirements that everyone  
18 would agree to after there had been numerous and different approaches that had  
19 already been developed.

20 But in fairness of the situation, it really wasn't clear what level PRAs were  
21 really going to be needed until the NRC issued the PRA policy statement in 1995  
22 and of course the issuance of the four Reg Guides that supported that. That was

1 a very significant underpinning that realized the need to have a PRA standard in  
2 the first place.

3 As Tony appropriately mentioned, we issued it; we had trial use; we actually  
4 had the standard used for peer review at San Onofre. As the staff was doing its  
5 endorsement of Reg Guide 1.200, we have had to do two addenda to bring the  
6 standard up to reflect some of that early experience in its trial use plus the  
7 endorsement by the Reg Guide.

8 The other big challenge we've had, and actually Chairman Klein it goes  
9 back to the comments you made last year to industry on the need for education  
10 and resources. We've taken a specific effort to get a training program on the  
11 standard itself working with the Nuclear Regulatory Commission and industry  
12 because as the industry indicated the resources are really stretched and the  
13 aspect of doing courses we have realized we had to put a special effort to get the  
14 right people to develop a course that everyone could use to understand the  
15 standards and that we've been working on here for the past year.

16 We are ready to roll that out. It is being done in coordination with EPRI's,  
17 Electric Power Research Institute, their PRA training programs. They're also  
18 under development. Next slide.

19 The next challenge has been that while back in late 1990's ASME took the  
20 lead on the internal events and ANS, the American Nuclear Society, in parallel  
21 took the lead to develop the other parts to make the full level one PRA elements.  
22 That being the external events and ANS has issued an external event standard

1 they published earlier this year, so that's already there.

2 The fire standard is in its third round of consensus ballot and we're working  
3 closely with ANS and we're hoping that ANS will have that standard available  
4 definitely this year, but they are actually expediting their work to have it to us in the  
5 beginning of fall. There's another reason and in just a minute I'll explain why we  
6 need that.

7 The low power shut down standard is going back for consensus ballot later  
8 this year and would be published early next year. That is what we're hoping in  
9 ANS in carrying out their efforts. ASME and ANS about three years ago realized  
10 that we had to collaborate better with the two societies plus all of our stakeholders,  
11 so we formed a nuclear risk management coordinating committee that includes  
12 key management from NRC and NEI as well as IEEE and the Department of  
13 Energy and the owners' groups and EPRI.

14 We came to a decision that having four separate standards may  
15 sound okay, but if you go out in time and we bring new people into the industry  
16 and the people that write them are retired or no longer involved, having four  
17 standards with a regulatory guide with industry guidance is now a significant  
18 number of documents for people to keep track of.

19 So we thought that it would be good to bring them together into one  
20 standard; have a joint ASME and ANS standard so we have consistency in format,  
21 definitions, terminology, language, but more importantly interpretation,  
22 maintenance, and it would provide stability and coherence over time rather than



1 have four separate documents being worked by four different organizations. It  
2 would bring it under one place.

3 We have ASME. My colleague, Kevin Ennis, has worked with his  
4 counterpart at ANS and the two sides have agreed to develop this joint standard.  
5 We would publish it with the two logos of the two societies and we really believe  
6 this is a beginning of a collaborative effort we need to do on other areas as well,  
7 just not the PRA standards itself.

8 We have been working the standard in parallel as the individual standards  
9 from the American Nuclear Society are being done, so as the individual standards  
10 have been coming out, Mr. Grantom has actually been leading a team, where  
11 we're bringing the ASME, the ANS external events and the ANS fire to bring those  
12 together and we're trying to have that done here by the end of the year so that all  
13 the requirements would be in one standard rather than have them in two or three  
14 different documents at that point.

15 Relative to Level 2 and Level 3, ANS is going to take the lead in pulling  
16 together the Level 2 and Level 3 Standard with our help and we have the lead in  
17 pulling together the joint standard with ANS's help for the Level 1. That's a very  
18 significant development we have underway and new break through for our  
19 organization.

20 On some related developments, ASME issued code cases allowing the trial  
21 use of risk informed methods for inspection and testing back in the 1990's and  
22 those Reg Guides 1174, 1175 and 1178 really provided regulatory stability for

1 those applications. We're continuing to get new information as applications. The  
2 ISI one, in particular, has been implemented in more than 90% of plants and it has  
3 been used in at least eight countries that I'm aware of.

4 We are currently interfacing with the staff on how to fold Reg Guide 1.200  
5 requirements into the PRA that are used to support that application. We've also  
6 developed and approved code cases for risk informing repair/replacement that ties  
7 in with 10CFR50.69 initiative that includes risk informed safety classification for  
8 pressure retaining components.

9 And for new and future reactors, Mr. Grantom has put together two working  
10 groups to look at what gaps we may need to address in PRA standards for the  
11 new reactors. We have risk informed classification process for design on new  
12 reactors under way and we also have research work on probabilistic design  
13 methods, such as reliability based load resistance factor design methods that have  
14 been used in the civil structural engineering community for many years. We're  
15 interfacing with ANS on those efforts as well.

16 And finally on these new reactor developments, we've been working closely  
17 with the Multinational Design Evaluation Program, particularly a team of us have  
18 gone to Paris and gone to Korea to discuss global standards and regulatory  
19 activities related to new reactor component manufacturing oversight.

20 So in summary, last slide please, slide five. We've been working in  
21 cooperation with NRC and the industry on these activities for nearly 20 years,  
22 beginning with the risk informed ISI in-service testing. We've had a significant

1 interface with those organizations and our sister society on the PRA standards  
2 development.

3 Our board has a risk management strategic plan that we update every four  
4 months to reflect all the activities, both of NRC and industry, to make sure our  
5 standards effort is locked in step with those two major stakeholder needs.

6 We definitely realize that standard development, this is a long-term  
7 commitment, particularly for the risk informed initiatives, but the benefits for ASME  
8 stakeholders, both industry and NRC, derived from making sure we are consistent  
9 in our format, our definitions, our terminology and language and making sure that  
10 the appropriate standards interpretation, maintenance and implementation will  
11 hopefully reduce the burden on the regulatory endorsement process. We believe  
12 this is all well worth the effort.

13 In closing, I'd like to again thank the Commission for the excellent NRC staff  
14 support and active participation in our nuclear codes and standards activities.  
15 Those contributions greatly assist our success for longstanding consensus  
16 standards and those efforts are deeply appreciated. And relative to PRA  
17 standards developed, at this time I'd like to particularly acknowledge the dedication  
18 and excellent contributions of Mary Drouin at the Office of Research who spent a  
19 decade – she's been with us from day one making sure the standards are coming  
20 in place. Thank you very much.

21 CHAIRMAN KLEIN: Thank you for those comments; very helpful.  
22 Commissioner Jaczko?

1                   COMMISSIONER JACZKO: I guess I would maybe start off where  
2 we left off. You heard some of the discussion about priorities and various activities  
3 that would be most important to get done. From your perspective, which of the  
4 standards do you think are really most important to get finalized?

5                   You touched on – we really haven't touched on Level 2 and Level 3 PRAs  
6 at all. You mentioned that a little bit, but maybe you could just comment on where  
7 that fits in with getting fire standards in place and other types of Level 1 PRA work.

8                   MR. BALKEY: Obviously, the internal events was critical to get done  
9 first. We have done that. I think because it was first that actually – it was new for  
10 the staff also in developing Regulatory Guide 1.200 to address that application.  
11 But clearly, the folks from the industry – I'm from industry as well, too – I'm a  
12 volunteer. The fire PRA standard is actually a critical item we have to get done.

13                   We also view – one of the colleagues on our Board is a fellow named  
14 Dr. Sid Bernsen. He's been in the industry for 56 years and he was involved in  
15 writing the first standards for our industry. He said it's quite important that it's okay  
16 to have the individual standards, but if we let them go too long it will be harder to  
17 bring them together to bring them into one document so you can truly integrate the  
18 requirements.

19                   Because we have instances back when we built plants from a design  
20 standpoint that could have gone that way, but they were all brought under the  
21 ASME Broiler and Pressure Vessel Code. All the requirements were brought in  
22 one set of books so users don't have to go to many different places. That's really

1 what we're striving for.

2 Right now, the two priorities are supporting ANS in their effort to get the fire  
3 standard done and we're feeling the pressure to get these all together in one  
4 document in a timely manner so the staff can do its endorsement process. We  
5 don't definitely want to get in a way of the industry being able to move forward  
6 particularly in that fire PRA application.

7 COMMISSIONER JACZKO: What is your forecast for when you think  
8 the fire standard will be completed?

9 MR. BALKEY: I can only speak for the information that has been  
10 provided by my colleagues from ANS, they're going through a third ballot. They're  
11 expediting that ballot. Hopefully, we'll have the answers here in a couple of weeks  
12 and we'll know if they can be able to turn that over here very shortly or it may need  
13 a couple more months to get it done.

14 So I think that's why they've indicated in schedules I believe to the staff who  
15 are working on the endorsement that by the end of the year for sure, but they're  
16 definitely trying to expedite it to pull it up earlier than that.

17 COMMISSIONER JACZKO: The next question I have, this is  
18 probably a little bit more of a technical question, but it was something my staff had  
19 come across. I thought it was an interesting issue, which perhaps shows might my  
20 naiveté about how some of these models work. Fundamentally, I'm not sure this is  
21 an ASME standard or part of the Reg Guide 1.200 or just general practice for  
22 these models work. It gets to the question of when we decide a model run is

1 done. What is the end state?

2 I guess as I understand it, essentially we have a 24 hour model system, I  
3 guess if you would, that if the plant is in a certain configuration for 24 hours then  
4 we consider it to be complete. I don't know if that's something you can comment  
5 on or any of you might – what is the basis for that 24 hours or how we use that?

6 MR. GRANTOM: This is Rick Grantom, South Texas. Typically, the  
7 determination of a final plant damage stage or in-state is usually characterized  
8 around the 24-hour period. This is usually about the time that emergency  
9 operating procedures have run a full course. The emergency response  
10 organization has responded and we typically say that at this point in time whatever  
11 the characteristics of the station are at 24 hours is where we'll stop because we're  
12 very uncertain after 24 hours what happens.

13 So if you could think in terms of a real event, many resources would befall a  
14 station that had some type of event. We're very uncertain as to how that would  
15 work with local authorities or with government agencies and that type of thing. So  
16 we typically have a 24-hour period to say here's where our state of knowledge of  
17 what we're certain about or more certain about ends and we become less certain  
18 so we stop there at 24 hours.

19 COMMISSIONER JACZKO: That's 24 hours from core damage or  
20 where is that 24 hours measured from?

21 MR. GRANTOM: Twenty-four hours from the initiating event.

22 COMMISSIONER JACZKO: Initiating event, okay. Are there events

1 that progress over longer than 24 hours?

2 MR. GRANTOM: There could be events that could go longer than 24  
3 hours.

4 COMMISSIONER JACZKO: What happens with those events? Do  
5 they get thrown out?

6 MR. GRANTOM: Usually they're conservatively binned at that point  
7 time. If we were to say, for example, there was late containment over-  
8 pressurization, we would bin it in that category at that point time. It would be  
9 conservatively quantified to be what it is if it goes larger or goes to some other  
10 statement. But then again at 24 hours we would say this is where we are and we  
11 would bin it in that category.

12 We also realize that if we were to do additional analysis and try to carry that  
13 further out, we'd have to start collecting a lot more information about what in fact  
14 would really happen at that point in time. We're uncertain at that point so we stop.

15 COMMISSIONER JACZKO: Thank you.

16 CHAIRMAN KLEIN: Commissioner Lyons?

17 COMMISSIONER LYONS: First, thank you very much for the  
18 presentation and thank you for the excellent work that ASME work does  
19 throughout the whole range of standard development. I was interested in the  
20 comments you made on the last slide about your coordination with global industry.  
21 You also mentioned MDEP as another area you're working in. I was curious what  
22 you might be able to say as far as that global coordination, specifically in PRA

1 standard areas?

2 MR. BALKEY: In fact, I'll make a statement. I'll probably ask  
3 Mr. Grantom to help out, too. Actually, thanks to Mary Drouin from NRC; Mary  
4 was very helpful in getting also Dr. Pamela Nelson from the University of Mexico to  
5 be a member of the Committee on Nuclear Risk Management and also Dr. Irina  
6 Kuzmina from the International Atomic Energy Agency who is located in Vienna.  
7 She's also a member. We also have representation from Japan and the United  
8 Kingdom on the technical consensus committee.

9 So when we bring – for instance, we brought the addendum forward as a  
10 result of the peer review that was at San Onofre and then the comments in dealing  
11 with Reg Guide 1.200. When they went to ballot, those international  
12 representatives vote and provide input just the same way as anyone here from the  
13 United States and it's part of the consensus ballot.

14 So we are trying to build our international representation knowing that this  
15 movement that's already moving forward with new construction in China and  
16 Korea and other parts of the world in Europe and even South Africa, that we have  
17 that representation tied in a standards development. Rick, you could probably cite  
18 specific instances and also at your meetings the input from the international  
19 members.

20 MR. GRANTOM: They are very active. Dr. Nelson works with us on  
21 the integration team and they've all been very active. Irina Kuzmina, as a matter  
22 of fact, has taken the existing ASME PRA standard that we have right now and is



1 looking to apply that to be VVER reactor designs. They had a pilot project over  
2 there that appears to be successful.

3 She will probably come forward with some changes possibly along that line,  
4 but it's that kind of thing that we're engaging the international community on and it  
5 takes a really active involvement in order to be able to do that. They are active  
6 and we're very pleased about the VVER project that was going on with that.

7 COMMISSIONER LYONS: Thank you.

8 CHAIRMAN KLEIN: Just curious, are there any gaps or differences  
9 between the ASME standard and NRC's Reg Guide 1.200?

10 MR. BALKEY: Not now. Not with Revision 1 that's come out. When  
11 we first issued the standard and the staff came out with Reg Guide 1.200 there  
12 were gaps or clarifications that were needed and that's why we went back and did  
13 the addenda. I'll ask Mr. Grantom, but I'd like to believe we have and I think that's  
14 what Tony Pietrangelo was getting at is now we have the standard, we had a trial  
15 use.

16 The staff has been able to bring it up and now we have things fairly well in  
17 lockstep on the internal events where the Reg Guide 1.200 Revision 1 and our  
18 PRA standard are locked together. Rick, you could probably speak more  
19 specifics.

20 MR. GRANTOM: I think we have harmonized now over the time, but  
21 as Tony mentioned it takes some time to get those dispositioned and get those  
22 resolutions when the fire PRA standard comes in and the others, you'll see the

1 same interaction that will occur as we go to Revision 2 of Reg Guide 1.200. But  
2 there will be some time as we resolve many gaps or differences that occur, but I  
3 believe Level 1 certainly right now are very well harmonize for internal events.

4 CHAIRMAN KLEIN: There was a comment made earlier about other  
5 industries now looking at PRA. From your perspective from ASME, are you seeing  
6 a movement other industries following the nuclear activities in PRA?

7 MR. BALKEY: Yes, for certain. ASME, we're a 120,000 member  
8 worldwide organization and we have over 1,000 volunteers that belong to a Safety  
9 and Engineering Risk Analysis Division. Those experts come from all the  
10 industries; the airline industry, aerospace, NASA, the petroleum and chemical  
11 processing industries and many others.

12 From an ASME code standpoint, probably the best example is I made  
13 mention of all the hard work we did working with NRC and industry on risk  
14 informed ISI. As that was taking hold, the other industries, particularly the process  
15 industries for petroleum and chemical, they developed an equivalent effort, it's  
16 called Fitness for Service and they have a risk informed process that they have  
17 developed or risk based prioritization.

18 They haven't gone to the risk informed terminology, but it's still the same  
19 concept of using risk insights to prioritize which equipment in these refineries or  
20 what parts of refineries are safety significant and then focusing the inspection and  
21 repair methods on the areas of high risk; so a number of standards. In fact my  
22 colleague Kevin Ennis – you can probably speak to that, you were specifically

1 involved.

2 MR. ENNIS: The petroleum refining industry and also the coal, the  
3 fossil side of power industry has also gone, we use the term risk informed, they  
4 just use risk. It's fundamentally a way on how they maximize the use of resources  
5 for in-service inspection. We have to remember on that side of the house they  
6 didn't have the same kind of in-service inspection code that we have in Section 11.  
7 They do it a different methodology.

8 That started probably at about the same time as the risk informed process  
9 in nuclear started. The industry came together on the consensus of broad base  
10 that risk insights had to be used. They just used two different methodologies.

11 CHAIRMAN KLEIN: Great. Thanks. Commissioner McGaffigan?

12 COMMISSIONER McGAFFIGAN: Can I follow up on that? The  
13 nuclear industry often time looks to me fairly unique. It has the sharing protocols,  
14 it has INPO and the mother of all – if you read the EPRI paper – the mother of risk  
15 informing is really the maintenance rule, because it produced hard data from which  
16 other things could flow. These other industries don't have some of those  
17 preconditions we have in the nuclear sector. They don't have the shared  
18 information about operating experience or maybe they do. I don't know.

19 MR. ENNIS: They do. It's regulated through the states. All pressure  
20 equipment as a practical matter is regulated in the United States.

21 COMMISSIONER McGAFFIGAN: Okay. Just not by a Federal  
22 agency.

1 MR. ENNIS: Not by a Federal agency.

2 MR. BALKEY: I just wanted to add that there's a North American  
3 Reliability Council and I can't remember what GADS means, but there's a NERC  
4 GADS database that tracks all failures in all of the fossil fuel fired power stations  
5 and it is an extensive database of events.

6 In fact, when we are doing the early research work on risk informed ISI, it  
7 was not just nuclear, we had nuclear, fossil, aerospace, civil structural engineering  
8 and the insurance industry. The insurance industry are very significant users of  
9 that database in terms of ensuring – from an industrial insurance standpoint.

10 COMMISSIONER McGAFFIGAN: I just learned something. The  
11 FAA will only tell you who's on time and whatever. It doesn't get into whether the  
12 plans are well maintained or what things might break down first. They have a  
13 private database that they have in aerospace, that's good.

14 You talked about harmonizing four separate standards and I understand –  
15 which four are you talking about? I need to understand what they are. Does that  
16 include shutdown and external events?

17 MR. BALKEY: ASME Internal, ANS External, ANS Fire, ANS Low  
18 Power Shutdown. They're the four. There's three ANS standards and one ASME.  
19 They are the four we're working to bring together. The low power shutdown we  
20 won't be able to fold that in right now, we're working to bring the other three  
21 together right at this moment.

22 COMMISSIONER McGAFFIGAN: You think the external events one

1 is far enough along in the voting process that it could be finished sometime soon?

2 MR. GRANTOM: The external events standard is published now. It  
3 is available now. We're in the process of folding that into the combined standard.  
4 We're currently waiting the fire, our top priority is to begin that item.

5 COMMISSIONER McGAFFIGAN: In one of your slides, you talked  
6 about risk informed ISI and IST and you bragged about ISI in 90% of the plants.  
7 You skipped past IST. IST I don't think has been very widely used – in-service  
8 testing. It probably was the previous panel I should have asked this of, but where  
9 was, in comparing those two now 10-year old plus efforts, where did we go astray?  
10 What did we do right on one and what did we do wrong on the other that it was  
11 almost never used?

12 MR. BALKEY: I think it really comes down to – I happen to be  
13 involved in both because my history goes back to chairing the research efforts for  
14 both the risk informed ISI and the IST. They were both done consistently. I think  
15 the staff went to great lengths in the two Reg Guides the 1.175 and 1.178 to be  
16 consistent with 1.174 that was providing the fundamental criteria.

17 I think it really comes down to what you gain from the application and I felt  
18 there was a real strong feeling in the industry for the in-service inspection that  
19 we're building a lot of scaffolds and there's a lot of radiation exposure in putting  
20 examiners next to those pipes. We showed it through the risk informed ISI that we  
21 weren't necessarily – we could go to a smaller population and move the  
22 examinations to other areas.

1           As a result of it, they were radiological benefits to the workers and actually  
2 when we did the risk calculations there were definitely risk benefits from that case.  
3 On the risk informed in-service testing, we were essentially looking at moving  
4 intervals out, but I think the licensees were gaining benefits from the tech spec  
5 work. There was risk informed tech specs going on at the same time. I'd probably  
6 look to Rick can help me out here on that because he can speak as a plant  
7 practitioner.

8           It's just a matter of where you're getting the most benefit for the investment  
9 you have to put in to do the effort. In the IST there was some plants that did do it  
10 and other insights that just didn't grab hold. But they were both done the same  
11 way. If you look at the ASME code and our code cases, there are consistent  
12 requirements. It wasn't that one missed the mark and the other one didn't.  
13 They're both very solid standards.

14           MR. GRANTOM: Ken's answer is basically the same answer.  
15 There's other benefits that came through. Technical specifications, even the  
16 exemption from special treatment requirements for South Texas provided some  
17 benefits in terms of testing and removing certain items from scope. It tended to  
18 dilute the overall effectiveness of what just strictly a risk informed IST program  
19 would be. It kind of was subsumed in others.

20           COMMISSIONER McGAFFIGAN: It was subsumed in other things.  
21 The ISI program on the other hand, you mentioned some of the benefits, but one  
22 of the main benefits was doing more online maintenance and shortening outages.

1 I think the EPRI paper brags about that as an ISI result.

2 MR. BALKEY: We have not done ISI online.

3 MR. GRANTOM: No. Not online.

4 COMMISSIONER McGAFFIGAN: I may have gotten it wrong. Mr. Chairman,  
5 we've got to get on to the next panel.

6 CHAIRMAN KLEIN: We do. We have one more panel. I'd also like  
7 to, as Commissioner Lyons indicated, to thank both you and Rick for your  
8 volunteering. We know that Kevin gets a lot of money full-time from ASME. But I  
9 think your volunteering really does provide an assistance to society. Thank you for  
10 that. Thank you very much for your presentation.

11 COMMISSIONER McGAFFIGAN: From just looking at the discussion  
12 in the EPRI paper the conclusion of one paragraph was this translates to fewer  
13 inspections to be performed during outages and lower personnel exposures, but I  
14 had it wrong. Thank you.

15

16 PANEL 3 DISCUSSION

17

18 CHAIRMAN KLEIN: Obviously, we've had a lot of questions, but I  
19 think we probably saved some for the staff. So we would like to now hear from the  
20 staff on your activities. So Luis, you ready to start?

21 MR. REYES: Chairman and Commissioners the staff is here to talk  
22 about risk informed regulatory activities. The last time we did that in partnership

1 with the industry in front of the Commission was May of 2006, so we would like to  
2 bring the Commission up to date on some of the activities and the progress that  
3 we made.

4 We believe we have made steady progress in implementing the  
5 Commission PRA policy related to risk informed and performance based activities.  
6 Today we'll only discuss the progress in the areas of reactors, but we have a lot of  
7 other activities where we have made progress also in the materials and waste  
8 areas. I just wanted to point that out.

9 I'd like to introduce the speakers today. Gary Holahan is here in his  
10 capacity as senior management level PRA Steering Committee member. Are you  
11 a member or the Chair?

12 MR. HOLAHAN: Member.

13 MR. REYES: Okay.

14 MR. HOLAHAN: The Chairman is on vacation.

15 MR. REYES: Farouk Eltawila who is the Director of the Division of  
16 Risk Assessment and Special Projects Office of Nuclear Regulatory Research.  
17 Mark Cunningham who is the Director of the Division of Risk Assessment, Office  
18 of Nuclear Reactor Regulation and Charlie Ader who is the Director of Division of  
19 Safety Systems and Risk Assessment Office of New Reactors.

20 I think one of the earlier panelists referred to pointy headed geeks. These  
21 individuals next to me used to be pointy headed geeks, but they have spent a lot  
22 of their career involved in risk related activities. I think we're going to bring to you



1 the summary of their experiences and the staff progress up to date. With that,  
2 Gary?

3 MR. HOLAHAN: Thank you. Some of the points have worn off with  
4 stress. Can I have the second slide, please? The second slide lists the acronyms  
5 and the one I might point out as the one that may be unfamiliar and new is RPP  
6 which is a reflection of the fact that the staff has reformed the old risk informed  
7 regulation plan into a new plan for risk informed and performance based plan,  
8 referred to as RPP. So if you hear that, that's the new and different acronym. Go  
9 to the third slide.

10 I'm just going to make some introductory remarks and then we'll go on to  
11 the meat of the presentation. As Luis said, I'm here representing the NRC's PRA  
12 Steering Committee which is a collection of office level representatives of all the  
13 program offices, OGC, Research and both in the materials and the reactor  
14 programs, multiple offices. The purpose is to provide an office level coordination  
15 and communication activity to interface with internal stakeholders to coordinate  
16 activities among offices and also to meet with industry and other representatives.

17 In fact, you heard it referred to earlier there was a PRA Steering Committee  
18 meeting with industry and some public participation. I think that was very useful in  
19 discussing and laying out some of the issues and I think in fact it pretty well  
20 informed today's meeting. You'll see the issues were discussed fairly well and laid  
21 on the table and I think it was very helpful in getting to where we are today.

22 What I'd like to do today is just provide a few introductory remarks and then

1 go on and have Farouk Eltawila from Research represents staff activities in the  
2 area of PRA quality; Mark Cunningham will speak to risk informed activities as  
3 they apply to operating reactors; and Charlie Ader will discuss risk informed  
4 activities in the new reactor forum. And then I'll come back for very short  
5 summary. Can I have the fourth viewgraph?

6 As Luis said, the last Commission meeting on this subject was in May 2006.  
7 It was a fairly long time ago. A fair amount has happened in the meantime. In  
8 response to some Commission direction, the staff has taken activities in two main  
9 areas, one being the reforming of the plan to deal with risk informed and  
10 performance based activities into a more integrated and goal oriented plan.

11 The second is at the Commission's direction take additional steps to better  
12 communicate what we are doing in the risk informed area. Two of those steps  
13 have to do with reforming the PRA Steering Committee and a PRA Leadership  
14 Team which is a collection of division directors representing the program offices  
15 who coordinate activities at a more detailed level and they also interface with their  
16 counterparts on working groups in the industry and other external stakeholders.  
17 That plays a very important part.

18 Lastly, the staff is in the process of revamping and updating the website  
19 associated with Probabilistic Risk Assessment. That ought to be put into place  
20 over the next several months, hopefully by the end of this fiscal year. At the  
21 moment, there is risk information on our website. You have to drill down about  
22 three levels to get it.

1           We agree with the Commission and see the need to enhance that activity.  
2           So that's right in the development stage now. So let me go right on to Dr. Eltawila  
3           to deal with PRA quality issues.

4                       MR. ELTAWILA: Thank you. As Luis indicated we have been  
5           making continuous progress in implementing the Commission direction to have a  
6           phased approach toward PRA to ensure that risk informed activities continue to be  
7           going on and at the same time ensure that the staff and the industry develop the  
8           quality for the PRA.

9           Toward that end, we briefed the Commission in March of 2007. We sent  
10          the Commission paper to update the Commission about the status of our  
11          accomplishments and the additional information that we need to achieve the  
12          Commission guidance. I'm going to talk in this viewgraph about what we have  
13          accomplished thus far and the next viewgraph I'm going to talk about the  
14          information that we need to have or the document that we need to produce to  
15          achieve and implement the phased approach for PRA quality.

16          As you've heard before, we have issued Revision 1 to Reg Guide 1.200 and  
17          at the same time we issued Standard Review Plan 19.1. Reg Guide Revision 1 to  
18          Reg Guide 1.200 is intended to provide guidance to the industry that when  
19          implemented it will minimize the staff resources in reviewing these PRAs in detail.  
20          So any application that follows that will result in significant savings in terms of staff  
21          review and industry responding to the additional questions for information.

22          Rev 1 of the standard endorses the ASME Level 1 and LERF PRA. It also

1 endorsed the NEI document about the self assessment which will identify the gap  
2 between the peer review and the standard. It goes on the lesson learned that we  
3 have from the five pilot application.

4 After we issued the Reg Guide in January of 2007 earlier this year, the staff  
5 became aware of a requirement about treatment of uncertainty. At that time we  
6 felt that the issue could cause difficulties for the licensee to be able to implement  
7 the requirement about uncertainty. So last month we held a public meeting,  
8 interacted with EPRI, NEI and other stakeholders and we issued a Federal  
9 Register Notice last month and provided additional clarification about staff intent of  
10 the treatment of the uncertainty.

11 Actually it's less burdensome than what was written in the standard right  
12 now. The staff right now proposed that the industry or the licensee have to identify  
13 what are the sources of uncertainty and assumption and not have to assess their  
14 significance on the PRA. So we want identification at this time.

15 As I mentioned earlier, we also completed the developmental update of  
16 Standard Review Plan 19.1 which provides guidance for the staff to be able to  
17 review any risk informed performance based application that's based on Reg  
18 Guide 1.200.

19 COMMISSIONER McGAFFIGAN: I think it's a clarifying question.  
20 Merrifield isn't here to police me. On this thing you just asked, you mentioned that  
21 this treatment of uncertainty. You have some breaking news since January. Is  
22 that something that's going to have to feed back into the ANSI process and they're

1 going to have to change? Are we stable or are we not?

2 MR. ELTAWILA: I think we are stable with the issuance of the  
3 Federal Register Notice. We're stable because we actually provide additional  
4 guidance to existing guidance to the industry. So I do think we have to go back to  
5 recycle the process again.

6 The second standard that we're working with the ANS on is the internal fire  
7 standards. As you've heard before, there been two drafts of the standard. NRC  
8 worked with the ANS on developing the standard. We provided substantial  
9 comments to the committee on both standards. The Chairman of the ANS has  
10 announced that they find that the new standard based on incorporating all the  
11 comments received from all stakeholder comments has substantial changes from  
12 the original standard and then he went for a third ballot.

13 But the words that we hear that they are going to produce the standard by  
14 the end of this year and that will meet our schedule that we promised the  
15 Commission to endorse all the standards, except for low power shutdown, by the  
16 end of 2008. If we get the ANS standard by the end of this year or early next year,  
17 I think we'll still be on schedule to endorse the fire PRA standard.

18 The third bullet related to Level 1/LERF integrated standard and that is the  
19 standard that you heard about earlier. I'm not going to elaborate on that, but we  
20 are pleased that ASME and ANS have agreed to combine the standard. We  
21 believe it will provide stability, consistency and efficiency in updating the standards  
22 and maintaining them. That's a step toward.

1           Our position is very clear about this issue. If the integrated standard is not  
2 ready by December of this year or early next year, we are going to endorse the  
3 individual standards. We are not going to hold until the integrated standard is  
4 complete.

5           Again, we have a collaborative agreement with ASME about developing  
6 training for the industry and we have under that cooperative agreement would  
7 provide them with financial aid and manpower. So hopefully we will be benefitting  
8 out of this training too. Next slide, please.

9           In order to accomplish what we set out to do to issue Rev 2 to Reg Guide  
10 1.200 by December of 2008, we are working with EPRI about development of the  
11 uncertainty methodology and we are developing a NUREG report which would be  
12 issued by the end of this month which would try to provide guidance to the industry  
13 about how to do PRA uncertainty in terms of model uncertainty and completeness  
14 issue.

15           So that Reg Guide because of the importance of uncertainty in PRA, we are  
16 going to have several workshops scheduled and we are going to allow for a month  
17 of public comments on that NUREG report. Once that NUREG report is finalized,  
18 we are planning to endorse the EPRI uncertainty methodology as part of that  
19 NUREG report.

20           Rev 2 to Reg Guide 1.200, we are again as I indicated earlier we are on  
21 track to produce that revision by December of 2008 and it will endorse the ASME  
22 and ANS integrated standard or the individual standard as the case may be. We

1 are working very closely with ANS to ensure that there will be no additional delay  
2 on the fire standards so we can meet the schedule.

3 In addition to the industry support on PRA training, we are also developing  
4 training here for the NRC staff and management and that training will be rolled out.  
5 For example, about how to use Reg Guide 1.200 and the Standard Review Plan.  
6 We are going to have one training which will be happening at the end of this year  
7 and that would be on Rev 1 to Reg Guide 1.200 and then another one at the end  
8 of next year and that would be related to Rev 2 of the Reg Guide.

9 Also, we are planning to update all the revisions to the Reg Guide series  
10 17.4, 17.5 and 17.6 to ensure they have the correct reference to Reg Guide 1.200  
11 Revision 2 and we're going to start that process immediately after we issue the  
12 NUREG 1.200 Rev 2.

13 Finally, we have signed a memorandum of understanding between NRC  
14 and EPRI about developing a common methodology to ensure that this SPAR  
15 models are robust and we'll not have these difficulties between our SPAR model  
16 and PRA model so we're going to come up with a systematic set of criteria to be  
17 applied for the development of the PRA model. We are also going to cooperate  
18 with them on Digital I&C PRA. So that completes my remarks. Mark?

19 MR. CUNNINGHAM: Next slide, please. I'd like to summarize recent  
20 accomplishments in the area of technical specifications, fire protection, special  
21 treatment requirements and the reactor oversight process.

22 In the past year or so with respect to technical specifications, progress has

1 been made with respect to the tech spec initiative 4b and 5b as was talked about  
2 earlier. Initiative 4b allows licensees to use their plant specific PRAs to determine  
3 the appropriate allowed outage times for equipment.

4 In our mind this better focuses plant staff on risks associated with specific  
5 configurations. This approach was documented in an NEI guidance document and  
6 was approved by the staff in May of 2007 and as was noted earlier, the South  
7 Texas pilot application amendment was approved in July of 2007.

8 The other area of technical specifications is area 5b. This allows licensees  
9 to use risk information to make changes in their surveillance test intervals. Again,  
10 this aligns tests intervals with the risk importance and it focuses the plant's staff on  
11 more risk important tests.

12 Like the case for 4b, this approach was documented in an NEI guidance  
13 document that was approved by the staff in September of 2006. The Limerick pilot  
14 application for that was approved in September 2006.

15 With respect to fire protection, in May 2006 the staff issued Reg Guide  
16 1.205. This endorses an NEI guide for the implementation of NFPA 805. As you  
17 know, NFPA 805 specifies standards for fire protection requirements and uses risk  
18 assessment to help focus on the most important fire issues. To date, 42 units  
19 have indicated their intent to use NFPA 805.

20 We are working with the industry at two pilot plants now to observe and test  
21 implementation of 805 and to discuss the results and prospectus from this in public  
22 meetings. After the completion of the pilots, we expect that NEI will update their



1 guide and we will update Reg Guide 1.205.

2 With respect to special treatment requirements, in May 2006 the staff  
3 issued Revision 1 to Reg Guide 1.201 for trial use. This endorses industry  
4 guidance for implementing 10 CFR 50.69 which permits licensees to use a risk  
5 informed categorization process.

6 Right now the principal activity in this area of special treatment  
7 requirements is the staff review of a topical report submitted that refines the  
8 categorization process and defines the needed level of detail needed by a licensee  
9 in their application. This topical report is based in part on pilot experiences at the  
10 Wolf Creek station.

11 With respect to the oversight process, we're continuing to improve the tools  
12 that are used in that process. We've updated 51 of the 72 SPAR models. We've  
13 completed four additional external event models and two second generation low  
14 power and shutdown models. We're also incorporating into the models the  
15 alternative mitigating strategies that have been introduced into the plants as a  
16 result of the B5b activities. Next slide, please.

17 In terms of near-term activities, a big one is the implementation of fire  
18 protection requirements. The staff continues to work with the industry to risk  
19 inform the fire protection requirements. I'll note that this work is not really  
20 constrained now by the technology of fire PRA. We're in more of a trial  
21 implementation phase. We're learning a great deal as was mentioned earlier from  
22 the two pilot plants and the issues that are in the future are going to be what we

1 learned from those trials, how we capture that in new guidance and then how to  
2 best deal with the set of 42 or 40 license amendment submittals so that we can be  
3 risk informed in the sense of those submittals and get them in over time and don't  
4 overwhelm the staff resources in this area.

5 We are developing or planning to develop new inspection procedures.  
6 We're developing a Standard Review Plan section that will be used for 805 related  
7 amendments. We're maintaining a list of what we call Frequently Asked Questions  
8 that as we do the two pilots so that other licensees who are going to be using 805  
9 will have kind of an on-line, real-time sense of what's changing in the applications.

10 And also note that we probably need to request additional enforcement  
11 discretion time because of the delays in completing the fire standards, because of  
12 the constraints in the industry resources and fire PRA and a variety of things. So  
13 we'll be coming to the Commission in the next couple of months to request an  
14 additional enforcement discretion time.

15 With respect to the maintenance rule, we are developing a Regulatory  
16 Information Summary to send out later this fall. In staff inspections of the  
17 maintenance rule, we have identified inconsistencies in the scope of the PRA that  
18 was used in the A4 work. In some cases, the fire risk analysis specifically was not  
19 included in the analysis for being done for A4. So we're issuing a risk that would  
20 clarify the intent of the rule which was that fire risk in particular and it's an all scope  
21 review, not necessarily quantitative, but the scope is all aspects of the PRA.

22 We'll probably be going to CRGR this month or next month on this and

1 expect to get it out later in the fall. And finally, we have two proposed rules or two  
2 rule related activities; one related to emergency core cooling requirements which  
3 was discussed earlier where staff is waiting for an SRM to know how to proceed  
4 and then the Commission also has a proposed rule on pressurized thermal shock.

5 This proposed rule would amend the requirements to permit an alternative  
6 voluntary approach to meeting PTS requirements that's more realistic in its risk  
7 information base. Again, when we have an SRM we'll proceed with that  
8 rulemaking. We'll follow the guidance. With that, I'll turn it over to Charles Ader.

9 MR. ADER: Thank, Mark. Slide nine, please. Most of the  
10 discussion today has been on operating reactors and use of PRA in operating  
11 reactors, so I don't want to lose sight of the success and the use of PRA in new  
12 reactors, an accomplishment we wouldn't take credit for.

13 You've been hearing of modifications to plants based on PRA insights. The  
14 designers have been using PRA up front to come up with much safer designs.  
15 We're seeing that in the reviews that have been completed and that are under  
16 way. As far as recent staff accomplishments, the revision to Part 52 will further the  
17 Commission's goal on PRA policy statement by the changes that were made there  
18 to require a living PRA, essentially it will enhance and ensure the quality in the  
19 maintenance of PRA into the future. That regulation is very near publication.

20 In support of that regulation, the staff has modified the PRA portions of a  
21 Reg Guide 1.206 and the SRP Section 19. Both of those have been issued to  
22 provide guidance on the information we're looking for in submittals for design certs

1 and COL holders for new reactors.

2 In that regard, we recently had a public meeting. We were apparently not  
3 as clear as we could have been in the guidance because there were some  
4 questions coming up very early in the design centered working groups about some  
5 of those requirements and how they fit in with the PRAs that are being developed  
6 by staff. So we did have a public meeting on July 19<sup>th</sup> with some clarifications.

7 There's some questions we're still reviewing and we'll need to be getting  
8 back to provide a little bit additional information on that in the next month or so.  
9 Slide 10, please.

10 Some of our near and actually longer term activities. We will be reviewing  
11 the PRAs for the designs. We're reviewing the ESBWR PRA. The PRA for  
12 AP1000 ABWR have already been reviewed as part of the previous certifications.  
13 We'll be reviewing the PRAs for EPR and APWR when we receive those.

14 One thing that we are trying to do that I did want to highlight here. As I  
15 mentioned, where industry has taken, the designers have taken PRA insights and  
16 tried to and factor them into the design very early on. We're trying to take the  
17 insights from our PRA reviews instead of doing the review as just a separate part  
18 of the review; trying to get some early insights that we can provide to the technical  
19 staff, technical reviewers to help and focus them on what may be important or less  
20 important so they can really focus their review effort there.

21 We're trying to do it also as part of the acceptance review process and  
22 inform what's significant with that and the time, I'll turn it back to Gary.

1 MR. HOLAHAN: In summary, the staff continues to make progress  
2 in continuing the implementation of the Commissions' PRA policy statement and  
3 the direction from the Commission in various SRMs. A lot has been  
4 accomplished. You've heard about them today, but there are still significant  
5 number of areas where staff attention and industry attention are needed.

6 As we go in the future, the Commission will see the staff activities  
7 presented in the new risk informed and performance based plan with the objective  
8 and goal oriented approach and also there should be fairly shortly our enhanced  
9 communications put in place to the website. And with that, I think we are prepared  
10 for questions.

11 MR. REYES: Chairman, Commissioners that completes our  
12 prepared remarks and we're ready for questions.

13 CHAIRMAN KLEIN: Thank you for a good presentation.  
14 Commissioner Jaczko?

15 COMMISSIONER JACZKO: Now that we have Reg Guide 1.200  
16 Revision 1 in place, where do you – and whoever wants to answer – where do see  
17 most of the PRA right now, the Level 1 PRA that would fall under that Reg Guide?  
18 Do you think that they'll meet Reg Guide 1.200 right now or is there work that has  
19 to be done to get them to meet those quality standards?

20 MR. CUNNINGHAM: I suspect there's a large number of them that  
21 will be very close to meeting the standard already, but it won't be the entire set.  
22 There'll be some that will have to do some work in terms of the internal events part

1 of it to get to the 1.200 standard.

2 COMMISSIONER JACZKO: And the ones that have to do work, is it  
3 a lot of work or little bit of work, do you think?

4 MR. CUNNINGHAM: It's hard to tell. It's hard to tell at this point.

5 COMMISSIONER JACZKO: Okay. The last two questions that I  
6 have, well I'll make one brief comment because I can't go through asking  
7 questions without commenting on something. I certainly personally would look  
8 skeptically on an additional request for an extension of enforcement discretion on  
9 the fire issues. The Commission already wants the original paper that came up to  
10 the staff – I'm sorry, to the Commission – was initially for, I think, a two year period  
11 of enforcement discretion.

12 The Commission approved a three-year period of enforcement discretion so  
13 this would really be for some plants a fourth year of enforcement discretion  
14 perhaps. As I said, I think fire protection is an area where we do not have a good  
15 regulatory program in place. There's a lot of reasons for that.

16 I think in my view the bulk of which is really the fact that plants were never  
17 really built with fire protection in mind. It's been a challenge. I think we have to  
18 get on to the business of moving forward with bringing people into compliance in  
19 the way we want them to. I will look skeptically on additional requests for  
20 extension in that.

21 I certainly think that NFPA 805 is a good approach. My sense from the  
22 pilots we have right now is that Shearon Harris is doing a pretty good job of doing

1 some things and Oconee has got some more work to do. I think I would probably  
2 say we have the 40-some plants that are coming in and I would say there's  
3 probably a high uncertainty factor, maybe plus or minus 10 plants, 20 plants that  
4 will actually move forward ultimately.

5 Again, I certainly think that at some point we have to get on to the business  
6 of bringing people into compliance. I'm not sure that more enforcement discretion  
7 is going to help. Back to a couple questions. These are more broad based  
8 questions, I think.

9 The very first slide that NEI showed, kind of showed a step graph. There  
10 was a block at the bottom there. I think two really important blocks at the base of  
11 that step was education, NRC education, education of licensees, Congressional  
12 education and public education. I'm wondering, as more and more of these  
13 activities involve more and more risk information and more and more PRA use, I'm  
14 wondering if you can comment on what the staff is doing to even enhance and  
15 improve on our ability to educate the public about these methods and these kinds  
16 of techniques because as that step shows, it's really a bedrock for ultimately  
17 having a successful risk informed program, we ultimately have to have strong  
18 public buy in to what we're doing. I don't think we're quite there yet.

19 MR. HOLAHAN: I guess we'd agree that we're not quite there and  
20 we're thinking that the primary mechanism for getting there will be the website. It's  
21 the fastest way to get to the most people. I think we made much better strides  
22 internally.

1           We have training programs and we've put hundreds of NRC staff through  
2 training courses at various levels, but that sort information or even explanatory  
3 information at that level, right now I suspect you'd have to read NUREG reports or  
4 Commission papers for the public to try get to that level of information.

5           There is some information on our website and you can dig it out, but I think  
6 we're looking towards an enhanced website as the best way to get there.

7           MR. REYES: We put a pamphlet together, a color brochure, a tri-fold  
8 on how to communicate risk. One is designed for internal communication of risk  
9 so we can train ourselves and communicate ourselves and one for external. The  
10 question is in what forums – it's hard to walk to the corner of Marinelli and stop  
11 somebody and say I want to explain to you about risk.

12           COMMISSIONER JACZKO: Have we tried that?

13           MR. REYES: No. I'd probably get arrested. So we have some tools  
14 and the question is how do you motivate, engage the public in general to be  
15 interested enough for us to communicate that and we have some work to do.

16           COMMISSIONER JACZKO: I appreciate that and I certainly think it's  
17 an import issue and I think if we are ultimately going to get to a really truly risk  
18 informed regulatory program we have to have that public buy in in the end. That's  
19 certainly going to require a lot of education.

20           I certainly think perhaps next year if we do a similar meeting that it might be  
21 useful to try and bring some people into the meeting, into this meeting who can  
22 offer that perspective and maybe we'll just pull them off the street, Marinelli, and



1 set them down and ask them to tell us what they think.

2 It wasn't something the Commission focused on this year, but I think we did  
3 certainly get a good variety of people talking this year. We certainly have to  
4 broaden it to the non-practitioners and the non-users in the future to really get  
5 where we want to go.

6 The last really brief question I'd ask is just again kind of a philosophical  
7 question. Certainly, an important issue for the Commission right now is security.  
8 Of course, we don't have a good way to incorporate security and terrorism type  
9 events into the PRA modeling and I think it's certainly, if nothing else, reminds us  
10 why we should move toward risk informing our regulations and not risk basing our  
11 regulations.

12 Maybe again, if any of you want to comment on how you eventually see us  
13 keeping track of those issues and not losing track of them as we start making  
14 more and more risk informed decisions.

15 MR. HOLAHAN: I'll take a shot at it and then Dr. Cunningham looks  
16 eager to speak, too. I think it's clear that there is a problem with risk informing  
17 security activities from the point of view that the first element of a risk assessment  
18 is usually establishing some initiating event frequency and that's the part that you  
19 can't do very well from a security point of view. Who's going to do what, on what  
20 frequency, and how they are going to do it. It really doesn't lend itself to the kind  
21 of traditional risk activities.

22 I think beyond that point, security and risk assessment are very tightly tied.

1 When we talk about mitigation strategies that the Commission ordered for  
2 operating plants, every one of those strategies is a risk informed strategy. Those  
3 are strategies placed to deal with the kinds of events that a terrorist activity could  
4 initiate, but largely those events look just like reactor accidents with a different  
5 cause.

6 A kind of mitigation strategies and events used and operator actions and all  
7 of those things that we don't talk about so publicly are really very well risk informed  
8 activities. I think likewise when we talk about security features for new reactors,  
9 there's quite a bit of risk thinking into what's a reasonable level of protection and  
10 what kind of features would be sensible to put in place.

11 I think the last thing I'd like to say is we're always sensitive to the fact that  
12 when we do have security requirements, they should not interfere inappropriately  
13 with a safety requirement for the plant so this sort of integrated safety and security  
14 view, I think, has developed fairly very well over the last few years and risk insights  
15 are an important part of that.

16 MR. CUNNINGHAM: I would just add my main point was Gary's last  
17 point. Security requirements and safety requirements can sometimes work in  
18 unusual ways in the other context. There is an established mechanism within the  
19 offices to look at those things, so we systematically try to examine if a security  
20 requirement might introduce an odd safety aspect to it and that sort of thing.

21 COMMISSIONER JACZKO: Thank you. I appreciate that answer. I  
22 apologize, but I have to run to another meeting, but I think it was a very good

1 meeting and I appreciate everybody being here and I apologize that I won't be able  
2 to hear the rest of the discussion from my fellow Commissioners.

3 CHAIRMAN KLEIN: Let me just make a little comment on  
4 Commissioner Jaczko's comments about education on risk and probability. That  
5 is, having been one that's given a lot of talks to general audiences on risk and  
6 probabilities, that is one in which people's eyes close over, not just on Marinelli but  
7 in a lot of other places. That's a very tough issue. People just don't understand  
8 risks and probabilities.

9 There are a lot of examples that we can relate to, Las Vegas being one and  
10 the other is lotteries. If people really understood – I always liked the description on  
11 lotteries as voluntary taxation for people who are not very good at mathematics.

12 As we go down to try to communicate risk and probability, it's going to be a  
13 tough issue, but we have to do it in terms that they can understand. I think that's  
14 the key that we have to do. Is not, say,  $10^{-x}$ . We have to give it in  
15 terms that people can better understand. That will be our challenge.

16 COMMISSIONER McGAFFIGAN: Mr. Chairman, just before Greg  
17 leaves, I'd also add that this stuff – the PRAs aren't available because of concerns  
18 of how they might be used by terrorists and also for proprietary reasons  
19 historically. The key tool we're describing qualitatively to people and its probably  
20 still going over their head, what we did many years ago, it's got to be five now, we  
21 got Dave Lochbaum, I think it was to Surry or North Anna for one of these peer  
22 reviews. I think he came back impressed.

1 I don't know what agreements he signed that he wouldn't disclose certain  
2 things, but I think it was a beneficial sort of thing to do. There aren't that many  
3 Dave Lochbaum's out there. He's worked in the industry for 17 years.

4 MR. REYES: He's a degreed engineer that has worked in the  
5 industry for a long time.

6 COMMISSIONER McGAFFIGAN: It isn't just communication  
7 because I think the Chairman is right. A lot of it is going to go over people's  
8 heads. It's very, very difficult stuff, but if we can find members of the public who  
9 have a different constituency from us, who can verify some of these things, that  
10 was a technique we used and used once successfully. We don't have Dave in the  
11 room to say whether it was successful, but my impression it was successful.

12 CHAIRMAN KLEIN: Commissioner Lyons?

13 COMMISSIONER LYONS: I know Greg is trying to leave, so go  
14 ahead and leave. I, too, wanted to comment on the importance of the educational  
15 aspects and really just echo the comments that have already been made. I was  
16 also going to add that in looking at what's currently on the website, I wasn't real  
17 impressed. I'm really happy, Gary, to hear you say that it's not intended to be the  
18 final answer.

19 MR. HOLAHAN: I checked also and was not very impressed.

20 COMMISSIONER LYONS: It's probably been well said by my fellow  
21 Commissioners. It has to be communicated in terms that the public can  
22 understand, perhaps by taking an example from daily life and treating that in a

1 PRA based framework to try to give folks the idea of what it means to do a PRA  
2 analysis along with putting things as much in context of other risks that people  
3 face every day.

4 I think by now you've heard from four of us on that point. I wanted to ask  
5 and I'm honestly not sure who I'm asking, it may be Gary, it may be Mark, it may  
6 be Luis. The point that I raised with industry, on the one hand, I certainly want to  
7 encourage plant specific PRAs to be improved. That's important for any number  
8 of reasons and I also understand the importance of our SPAR models. I  
9 understand the importance of our staff being able to do their own calculations in a  
10 PRA setting.

11 I'm just curious if you have any ideas how to bring together these two points  
12 of view. Can we ever get to the point? Is it an admirable goal to be trying to use  
13 the plant specific PRAs at some point in the future? I think it is, but I don't quite  
14 see how to get there.

15 MR. HOLAHAN: I'd like to complicate the question before I help with  
16 it. I'm not sure that it's an inherent problem that there are two independent people  
17 calculating the same event with two different models and getting maybe somewhat  
18 different answers and insights that they can go and discuss. What you heard is  
19 some discussion of the back and forth as though that's a problem. Well, maybe it  
20 takes time, but my experience with going back and forth is usually you get a better  
21 answer when you have two things to deal with and some dialogue. So first is I'm  
22 not so sympathetic to the problem.

1 COMMISSIONER McGAFFIGAN: The green and white boundary?

2 MR. REYES: That's a different issue. That's how it's being used.

3 COMMISSIONER LYONS: Are we forcing them to be related? I

4 don't disagree with what you just said. Yes, having different perspectives is

5 always useful. Discussing them is always useful, but it doesn't mean you have to

6 agree either.

7 MR. HOLAHAN: What I think the real problem is if there is a

8 deficiency in our model or theirs, which is leading to these disagreements, then I

9 think we have a technology problem and that we should make the models better

10 so that the disagreements are less frequent.

11 So I think our energy ought to be focused on both sides having good

12 models and not on saying that all of us using one model versus two models is the

13 problem. I think we're poking at the wrong part of this problem.

14 COMMISSIONER LYONS: But you're focusing in a different area. You're

15 focusing on the insights that you can gain from the two models, whereas I think

16 Tony in his comments was focusing on the specific numerical value as Ed was

17 referencing. To me those are slightly different.

18 MR. REYES: Let me add to that because from my time in the field

19 when I used to earn an honest living, I dealt with this. I agree with Gary. I think

20 that two different groups with two models checking things back and forth is the

21 right thing to do. But what you end up getting – you never have an argument in

22 the industry if both models have a green and you never get an argument with

1 industry if both models say its white or both models say its yellow. Okay?

2 When you get into a disagreement with the industry is when each group  
3 comes slightly on the other side of the line because it has an implication for them.

4 The big issue is the utilities, for a lot of reasons, do not want to have a white  
5 finding. Period. Even if they are never going to get another one. Forget about  
6 that part, a lot of implications.

7 The companies are willing to spend a quarter of a million dollars or more  
8 just to address that. So we feel we have to spend a quarter of a million dollars to  
9 make our point. Here ensues the resources.

10 COMMISSIONER McGAFFIGAN: You're arguing about on green  
11 light threshold 10 to the minus 6 event.

12 MR. REYES: I know. But you have to as a regulator put in a position  
13 and out position is this and their position is that. My point is that it's not the  
14 process, it's what you do with the process. In other words, the outcome of process  
15 and how you treat it. I think that that's a better discussion than whether you have  
16 two models and two groups because we have found out and I think the industry  
17 has found out a lot of good insight by having two groups with two models because  
18 that exchange does a lot of good and people learn a lot and actually good insights  
19 come out of it.

20 So the question is when you get into the situation where they're both slightly  
21 on the other side of the line, what do you do with that? What is the right thing to  
22 do with that? I think that's a better –

1                   COMMISSIONER LYONS: My question to your final question. I don't  
2 disagree with you that having two approaches gives you two sets of insights can  
3 be very, very important. But I guess I would be very interested, not necessarily  
4 today, but asking the question in the future of are there ways in which we can  
5 restructure how we're using the output so that we don't you get into let's say too  
6 much emphasis on the differences that may be within uncertainties?

7                   MR. REYES: I think so. I think that's where we have to put the  
8 energy on. Once you come up with this kind of situation, how to deal with it.  
9 What's the right thing and do?

10                  COMMISSIONER McGAFFIGAN: I'm going to use Pete's time. You  
11 heard some proposals in this particular cornerstone, singular or plural, where this  
12 comes up. Could we do some of the things that we did with the MSPI which the  
13 staff as a general matter – I've been bringing up for years should two get you to  
14 yellow or two gets you to yellow and therefore to the third column?

15                  If the SPAR model says its 1.01 times 10 to the minus six, therefore it's a  
16 white, and the next one comes along and it's 1.2, they're still nowhere near yellow  
17 in the combined events and there's got to be some judgment there or something.

18                  MR. REYES: I don't know what the answer is, but I think that's an  
19 issue we need to work on.

20                  COMMISSIONER LYONS: Count me in as agreeing.

21                  MR. REYES: I think we just have to engage with the industry and  
22 deal with that and see what can we do.



1 COMMISSIONER LYONS: I'm over time. Can I ask one more?

2 CHAIRMAN KLEIN: Yes. Ed took part of your time.

3 COMMISSIONER LYONS: Probably for Mark. On the NFPA 805,  
4 I'm curious as we're working towards this, as industry is working towards this, this  
5 may not be a completely fair question for you, but are we also working on the  
6 inspection procedures that we're going to use as these analyses start coming in?  
7 And as part of our evaluation of the industry's product on 805, will we be looking at  
8 their PRA model?

9 MR. CUNNINGHAM: The answer to the first part is with respect to  
10 inspections, the answer is yes.

11 COMMISSIONER LYONS: We're thinking ahead towards  
12 inspection?

13 MR. CUNNINGHAM: We're thinking ahead toward two steps; one is  
14 the actual amendment application and review. So we're thinking SRP and that  
15 sort of thing. And then we're also thinking about after that in terms of inspection.

16 MR. REYES: Sunil is going to talk a little bit about what we are  
17 actually doing. Mark is right; yes.

18 MR. WEERAKKODY: What we are doing is we basically define the  
19 805 as the completion of the first triennial of a plant that has completed transition  
20 to 805. That's why you look at the who package and the inspection procedure, the  
21 SRP and the license amendment review as the path to completion. They are all  
22 tied together. 805 licensees want the certainty at the inspection level.

1           So what we do is through our pilots and observations when we disposition  
2 issues we say this will be handled under the license amendment request. This will  
3 be handled under the inspection. And then we have discussions. We have had  
4 four workshops. So that's all integrated.

5           With respect to your second question, it's a resource issue. I think the  
6 staff's plan is to not to get ourselves into a situation where we review each PRA of  
7 each licensee. We would hope the licensees commit to meet the standard and  
8 that would be good enough for us. We might do follow up inspections here and  
9 there, but that's the plan.

10           MR. REYES: The verification procedure is going to have to be  
11 updated.

12           COMMISSIONER LYONS: That's at least the point I was hoping to  
13 make, too. I do think that there should be some degree of verification. I don't  
14 know quite how you'd do it, certainly not taking it apart piece by piece, but I do  
15 think we should look at the PRA model on which the conclusions are based.

16           MR. WEERAKKODY: There will be some and how they need to be  
17 done is again these are all in the integrated plan. We have another where NEI is  
18 working on a peer review guide on the fire PRA. We would use basically their – to  
19 do a peer review and those peer reviews would identify what we call FAQs. So  
20 when the staff goes on a verification plan, their focus would be what were the  
21 identified deficiencies by your peers and how did you disposition them.

22           MR. REYES: Let me give you a real life example that I envision is

1 not only true, but it would be more on the 805. On the PRA you're looking into  
2 assumptions and you assume a particular area doesn't have a lot of combustibles  
3 in it and doesn't have a lot of ignition sources, et cetera, et cetera. If the Inspector  
4 is walking around and they just happen to put a pallet there with 200 gallons of  
5 diesel fuel lube oil that they are going to replace and they just stage it there, you're  
6 just outside your assumptions on the PRA. In our field verifications, we're going to  
7 move our procedures to what we did today to make sure it matches that. We will  
8 field verify that those things remain on a periodic basis.

9 COMMISSIONER LYONS: Thank you. I went way over thanks to  
10 Ed.

11 CHAIRMAN KLEIN: I have a question for both Gary and Mark and  
12 since I know Gary is quick on his feet, I'll ask him first.

13 MR. HOLAHAN: I might refer it to Mark.

14 CHAIRMAN KLEIN: You heard the industry's top three. What should  
15 we do for moving the issues forward? What's your top three?

16 MR. HOLAHAN: My list came out to be four, so I cheated and made  
17 it three.

18 CHAIRMAN KLEIN: We'll let you have four.

19 MR. HOLAHAN: You want to hear the four? Okay. It's possible to  
20 condense four into three. Risk informed tech specs; 50.69 implementation and if  
21 you want to cheat, you could make those both implementation of related  
22 operational risk informed activities; fire protection and 50.46a.

1                   COMMISSIONER McGAFFIGAN: You're dropping their concerns  
2 about SDPs?

3                   MR. HOLAHAN: I don't think SDPs, in my mind, is that big a  
4 problem. There are issues to be worked, but I don't think they are as important.  
5 We have a program I think the ROP and the SDP portion are working very well  
6 compared to our oversight programs at any time in the NRC history.

7                   MR. REYES: A white finding is not an issue. It's only an issue when  
8 you have a finding. I'm going back to my issue. It's – how do you deal with it?

9                   CHAIRMAN KLEIN: Mark?

10                  MR. CUNNINGHAM: 50.46a, tech specs, fire protection. And then  
11 the fourth one would be SDP, if I had four.

12                  CHAIRMAN KLEIN: Thanks. At least I think in all of these there's  
13 some commonality. So I think we have a way forward. I think, Farouk, you  
14 mentioned there's a December '08 deadline that's contingent on meeting a  
15 December '07 deadline. Are we going to make December '07?

16                  MR. ELTAWILA: I think it's the ANS and ASME are the ones that  
17 need to provide us with the information. We are working with them, but the  
18 deadline is to have either the integrated standard by December of '07 or have the  
19 fire standard by December '07 and then we would be able to incorporate it in our  
20 process and endorse either the integrated standard or the fire standard by  
21 December of '08.

22                  That's the major obstacle right now is the fire standard. As you heard

1 earlier, the external event standard is already available so we'll be able to  
2 incorporate that into the process without any problem.

3 CHAIRMAN KLEIN: You think we'll make both of them.

4 MR. ELTAWILA: I think we can make both of them, yes.

5 CHAIRMAN KLEIN: A question for Luis, since you have all the staff.  
6 What do you do to motivate people to keep pushing the frontiers on risk informed  
7 performance based?

8 MR. REYES: I think the best way to do that is to show the safety  
9 improvements. I know Commissioner Jaczko had an issue with the curves and the  
10 numbers. I deal with it in a real life way. I was not a pointy headed person like  
11 these were. I came from the hands-on and I'll give you a couple of examples that I  
12 think that's what you show people.

13 You take some pressurized water reactors that have realized that if they put  
14 an additional make up pump to make up water, non safety related, but  
15 nonetheless gives them a lot of operational flexibility, and when you look at the  
16 accident scenarios, a significant reduction in the core damage frequency and you  
17 go out there and you see example after example of utilities investing money in this  
18 equipment to be added to the facility that gives them both safety and operational  
19 flexibility, all that came out of the PRA. I don't think that would have really come  
20 out.

21 You go and show them how safety has really been enhanced by physical  
22 changes out there in the field, clearly connected to this tool and this insight. I think

1 that speaks for itself. You get away from the charts and the numbers and you go  
2 down and put the hands on the pump and say this equipment would not be here if  
3 it was not because of risk insight. That to me is the easiest way to communicate  
4 to engineers what this is all about and in my personal view that's how I get it.  
5 That's how I think this is a very, very good improvement in safety.

6 CHAIRMAN KLEIN: And then internal, since we are the regulator,  
7 what you do to motivate your staff to keep pushing those frontiers?

8 MR. REYES: I think the understanding of the safety enhancements  
9 can be achieved. I think the managers to my left and to my right do that all the  
10 time in terms of talking to their people. I think we point to them why this is a good  
11 tool for improving safety.

12 CHAIRMAN KLEIN: Okay. Good. Commissioner McGaffigan?

13 COMMISSIONER McGAFFIGAN: Let me first say that this  
14 enforcement discretion issue that Commissioner Jaczko laid down Mark on, I am  
15 not in that camp. It's one/one and I'll let my two colleagues decide it. It strikes me  
16 that you're going to make a very compelling case for enforcement discretion.  
17 Enforcement discretion is the practitioner out there, Luis, a lot of these guys  
18 haven't been, but that doesn't mean that things are not documented.

19 MR. REYES: Correct.

20 COMMISSIONER McGAFFIGAN: They're fully documented, its just  
21 that we don't spend a lot time on enforcement actions and deciding how bad to  
22 penalize people who are simply caught by the fact that the infrastructure didn't

1 come along in time for them to get their amendment done.

2 MR. REYES: All I ask is wait until we give you the paper. I think we'll  
3 make some rational arguments and the Commission can be the judgment on that.

4 COMMISSIONER McGAFFIGAN: The paper I think you forecasted,  
5 it's going to ask for an additional period of enforcement discretion. My colleagues  
6 have to understand that doesn't mean that we're not writing up inspection findings  
7 and asking people to fix things if there's a compelling case. It's just that we don't  
8 get into the additional scoring of it and asking for fines or whatever it is that we're  
9 avoiding.

10 COMMISSIONER LYONS: I will assure you that I have not pre-  
11 judged the paper.

12 COMMISSIONER McGAFFIGAN: I haven't totally prejudged it  
13 either, but I just wanted to balance what was said earlier.

14 With regard to the infrastructure we have for SPAR models, are we putting  
15 adequate resources into updating it? Are we going to have fire and external into  
16 the SPAR model in a finite period of time once those standards are available?

17 MR. ELTAWILA: The answer is yes. We have adequate resources  
18 to support the update of the SPAR models and keeping them representing the  
19 plant as designed and as operated. We are working on several models for  
20 external events right now and we are going to be planning for the fire models in  
21 the next fiscal year.

22 COMMISSIONER McGAFFIGAN: Is that enough to keep pace with

1 requirements of NRR for processing licensing actions or whatever other ways the  
2 SPAR models are used?

3 MR. ELTAWILA: I would hope that we'll be supportive to them so  
4 whatever they need we'll provide them with that information.

5 MR. REYES: We budgeted money. What the Commissioner is  
6 asking is there enough money.

7 MR. ELTAWILA: There is enough money to update the SPAR  
8 models, yes.

9 COMMISSIONER McGAFFIGAN: Tony is expressing some surprise  
10 with his facial motions, but –

11 MR. REYES: He hasn't seen the increase in fees yet.

12 COMMISSIONER McGAFFIGAN: Okay. The question of priorities. I  
13 will, and I'm not going to go into a long discussion because I have 1:50 left. The  
14 staff who briefed us this morning, and Gary was there, feels very strongly that the  
15 50.46b rulemaking which is going to be a mandatory rule has to catch up defacto;  
16 whatever we do in trying to get it 50.46a finished before anybody's going to want to  
17 implement it. You heard that repeatedly.

18 MR. HOLAHAN: But not from me.

19 COMMISSIONER McGAFFIGAN: Okay. You think that they could  
20 do useful –

21 MR. HOLAHAN: I think they can be done in parallel with the existing  
22 requirements as separate issues.



1                   COMMISSIONER McGAFFIGAN: What do we put in the 50.46a  
2 rule? Do we put the existing 50.46b we don't believe in or do we put –

3                   MR. HOLAHAN: We put the existing 50.46b which is being  
4 researched.

5                   COMMISSIONER McGAFFIGAN: This isn't being researched. The  
6 research is over. Research is providing the results at the end of September and  
7 the staff is then going to launch into a rulemaking which is a significant change  
8 from the current 50.46b and we talked about them during this period of  
9 uncertainty. If licensees hear this, if you come in during that period where we're  
10 intending to do 50.46b, your first RAI is going to be tell us why you would be in  
11 compliance with this part of the rule as we're proposing it.

12                  MR. HOLAHAN: I think the distinction between the existing 50.46b  
13 and what might come out of the research effort is a relatively small difference.  
14 You're talking about 15% versus 17%.

15                  COMMISSIONER McGAFFIGAN: This additional phenomenon.

16                  MR. HOLAHAN: It could very well be that for a lot of applications in  
17 doesn't make any difference. So I think staff would have to judge that on a case  
18 by case basis as presumably it does today. If there's any safety concern, the staff  
19 will deal with them on a case by case basis.

20                  MR. ELTAWILA: I agree with Gary.

21                  COMMISSIONER McGAFFIGAN: All the folks who love PRAs and  
22 think they're perfect think we should plow ahead as we did with 50.69 and I'll point

1 out that we don't have any applications three years later, we won't have one till  
2 next year, expend resources on that for theoretical reasons so that we have it on  
3 the books. We make some sort of grand statement.

4 My bet would be that if we make that grand statement on too fast a horizon,  
5 it'll be 2015 or 2025 before somebody comes in with an application. We did that  
6 once. We made that mistake once. We followed theoretical thinking and we got  
7 precisely nowhere in the last three plus years. Whatever.

8 MR. HOLAHAN: I don't think I agree with that characterization of the  
9 situation.

10 COMMISSIONER McGAFFIGAN: I'm amazed that 50.69 is on your  
11 list and it's not on the industry's list and we don't even have – I guess we might get  
12 an application sometime in the middle of next year. But okay.

13 CHAIRMAN KLEIN: Do you want to give your counterpoint?

14 MR. HOLAHAN: My own counterpoint was I think that the cladding  
15 oxidation issue, which I think will change the way we characterize cladding  
16 performance during LOCAs will be different, but in practice the difference will not  
17 affect plant operation or plant safety set points or plant risk assessments.

18 It's an important detail that we need to work out, but I don't think it has such  
19 a large effect on the acceptance criteria for LOCAs that it needs to be settled as a  
20 precondition to moving forward on 50.46a.

21 COMMISSIONER McGAFFIGAN: The other staff seems to think it  
22 was important for small break LOCAs.

1 MR. ELTAWILA: It is important if you compare it to the conservative  
2 analysis of Appendix K, but if you do a realistic analysis, it might not be that  
3 important.

4 COMMISSIONER McGAFFIGAN: Okay. Thank you.

5 CHAIRMAN KLEIN: Commissioner Lyons?

6 COMMISSIONER LYONS: I'm just debating here. I'm not sure we  
7 should be discussing this morning's meeting at all, so I think I will refrain from  
8 saying that I don't quite agree.

9 COMMISSIONER McGAFFIGAN: I don't mind talking about how  
10 we're trying to resolve SRMs in public. These are hard issues. I almost would  
11 have had this morning's meeting down here. Probably not invited everybody to  
12 speak, but we're trying to learn and we're trying to figure out what's going on. That  
13 can happen in public or it can happen in private.

14 CHAIRMAN KLEIN: One thing that I think from my perspective,  
15 there's a lot of consensus on the importance of 50.46a, both from the industry and  
16 the staff. I think there are some nuggets that we're hearing. Honorable individuals  
17 can have little tweaks, but I think at the 50,000 foot level –

18 COMMISSIONER McGAFFIGAN: The position that I was hearing  
19 this morning from most of the staff which apparently the PRA analysts don't agree  
20 with, but the NRR position is that it would be very useful to get 50.46b done  
21 approximately concurrently with 50.46a.

22 MR. HOLAHAN: I agree. I heard that this morning.

1 COMMISSIONER McGAFFIGAN: Those people –

2 COMMISSIONER LYONS: We also discussed ways around that that  
3 had some degree of support from those same people.

4 CHAIRMAN KLEIN: Just since Mark is a victim and I see that NRR is  
5 on his tag, he also had 50.46a. Anyway, we will do our due diligence on these  
6 issues as we go forward.

7 I'd like to thank all the panelists for their participation. This obviously is my  
8 first discussion of the PRA and I think you can tell from the interest in the  
9 questions, it's something that certainly all the Commissioners have some strong  
10 feelings and would like to see it push forward in a well constrained way because it  
11 is important and I think the important thing is that it is nice that we don't have to  
12 compromise safety and operation. The fact that they complement each other and I  
13 think that technology and looking at the important things is very helpful.

14 Any other comments? Meeting is adjourned. Thank you.

15