



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

June 15, 2015

MEMORANDUM TO: ACRS Members

FROM: Michael R. Snodderly, Senior Staff Engineer /RA/  
Technical Support Branch, ACRS

SUBJECT: CERTIFIED MINUTES OF THE ADVISORY COMMITTEE  
ON REACTOR SAFEGUARDS RELIABILITY AND PRA  
SUBCOMMITTEE MEETING ON FEBRUARY 20, 2015

The minutes for the subject meeting were certified on June 7, 2015, as the official record of the proceedings of that meeting. Copies of the certification letter and minutes are attached.

Attachment: As stated

cc w/o Attachment: M. Banks

cc w/ Attachment: ACRS Members



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

MEMORANDUM TO: Michael Snodderly, Senior Staff Engineer  
Technical Support Branch, ACRS

FROM: John W. Stetkar, Chairman  
Reliability and PRA Subcommittee

SUBJECT: CERTIFICATION OF THE MINUTES OF THE ACRS  
RELIABILITY AND PRA SUBCOMMITTEE MEETING ON  
FEBRUARY 20, 2015, IN ROCKVILLE, MARYLAND

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meeting are an accurate record of the proceedings for that meeting.

<b>R/A</b>	<b>6/ 7 /15</b>
John W. Stetkar, Chairman	Date
Reliability and PRA Subcommittee	

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
MINUTES OF THE ACRS RELIABILITY AND PRA SUBCOMMITTEE MEETING  
FEBRUARY 20, 2015

The ACRS Reliability and PRA Subcommittee held a meeting on February 20, 2015 in TWFN 2B1, 11545 Rockville Pike, Rockville, Maryland. The meeting convened at 8:33 a.m. and adjourned at 11:30 a.m.

The entire meeting was open to the public.

Ed Lyman of the Union of Concerned Scientists requested time to make oral statements. No written comments were received from members of the public related to this meeting.

ATTENDEES

ACRS Members

John Stetkar, Chairman  
Ronald Ballinger, Member  
Dennis Bley, Member  
Charles Brown, Member  
Joy Rempe, Member  
Michael Ryan, Member  
Stephen P. Schultz, Member  
Gordon R. Skillman, Member

NRC Staff

Michael Snodderly, Designated Federal Official  
Ed Hackett, ACRS  
Michel Call, NMSS  
Mary Drouin, RES  
Rich Correia, RES  
John Nakoski, RES  
Richard Dudley, NRR  
Joseph Giitter, NRR  
Lawrence Kokajko, NRR  
Aby Mohseni, NRR  
Natreune Jordan, NRR  
Donald Harrison, NRO  
Mark Lombard, NMSS  
Meraj Rahimi, NMSS  
Joseph Rivers, NSIR  
Randy Sullivan, NSIR

Other Attendees

Michael Tschiltz, NEI  
John Butler, NEI  
Jana Bergman, Curtiss-Wright/Sciencetech  
Stanley Levenson, AREVA  
Tom Hiltz, DOE

Other Attendees (Continued)  
Jim O'Brien, DOE  
Ed Lyman, UCS

## SUMMARY

The purpose of the meeting was to discuss the status of the staff's plans for responding to direction from former-Chairman Jaczko to review NUREG-2150, "A Proposed Risk Management Regulatory Framework," and provide a paper that would identify options and make recommendations, including the possible development of a Commission policy statement. The meeting transcripts are attached and contain an accurate description of each matter discussed during the meeting. The presentation slides and handouts used during the meeting are attached to these transcripts.

SIGNIFICANT ISSUES	
Issue	Reference Pages in Transcript
1. J. Giitter, Director of Division of Risk Assessment, provided an opening statement for the staff where he outlined the presentation, provided introductions and mentioned the key objective to inform the Subcommittee on the staff's efforts in evaluating a possible Risk Management Regulatory Framework.	6-9
2. R. Dudley discussed background and implementation options the staff is considering for a possible Risk Management Regulatory Framework for power reactors. He also discussed plans for moving forward.	10-69
3. Member Bley asked the staff to confirm that the Commission's direction was to perform an agency-wide evaluation.	11
4. Member Skillman asserted that security is a subset of safety.	13
5. Member Schultz asked about establishing goals and objectives to allow for evaluation of comparative risks.	20
6. Chairman Stetkar asked about a previous draft policy statement. R. Dudley confirmed that one was published and a public meeting was held to solicit feedback but the staff has moved on from that version.	23
7. Member Brown asked what distinguishes Option 2 from the Risk Prioritization Initiative. Member Rempe asked about the PRA needed to support Option 2 versus Option 3.	29
8. Member Skillman and the staff discussed the importance of plant configuration control and how the plant is modeled in the PRA.	32-38
9. Chairman Stetkar questioned the staff about the specified criteria used to support Option 2 versus Option 3.	39
10. R. Dudley begins discussion of Option 3.	44

11. Member Skillman asked what a hypothetical Option 3 plant would look like compared to a currently operating 10 CFR 50 Appendix A plant.	47
12. Member Brown, the staff and various ACRS Members discussed the ability of the PRA to model potential self-approved changes to digital I&C systems that may appear to be less than the $10^{-7}$ $\Delta$ CDF acceptance criteria but may not be because they violate certain firewall design criteria.	52-59
13. Member Rempe asked if the staff considered additional specified criteria that potential changes not exceed 5 percent or 10 percent of overall plant risk to address advanced plants like the AP-1000 with relatively lower core damage and large early release frequencies.	60
14. D. Harrison reminded the Subcommittee that at some point the staff's going to have to address the ideas of defense-in-depth, safety margins and that type of thing when developing specified criteria. R. Dudley mentioned that the Commission Paper to address NTTF Recommendation One had some substantial recommendations for improving the definition and criteria for adequacy of defense-in-depth. He suggested that the staff would likely include that effort into one or more of the proposed options.	68
15. J. Rivers provided insights into NSIR's activities to risk-inform security.	70-102
16. In response to a question from Chairman Stetkar on uncertainty, J. Rivers described the activities of the Intelligence Liaison and Threat Assessment Branch. He described how this branch assesses terrorist activities worldwide and informs the Commission on whether the design basis threat needs to be revised. These activities include estimating likelihood and relative risk rankings. Member Bley extolled the benefits of relative risk rankings in this area.	76
17. Chairman Stetkar asked about a cyber security risk model being developed at Pacific Northwest National Laboratory. This model also includes the physical plant.	81
18. J. Rivers stated that ARES Corporation has developed simulation models of two or three nuclear sites. He mentioned that the staff is trying to determine what role these models could play in supporting a risk-informed regulatory framework.	84
19. Member Rempe asked if the material attractiveness model considered adversaries who may just want to wreak havoc.	87
20. Member Brown asked about the application of Regulatory Guide 5.71.	91
21. J. Rivers mentioned the three-day workshop on vulnerability assessment tools scheduled for September 2015. Member Bley asked about Department of Energy involvement.	98
22. Member Brown and Member Schultz asked about access points and barrier evaluation.	100
23. M. Call provided insights into NMSS activities to risk-inform spent fuel storage and transportation. These activities include investigating adequate defense-in-depth.	103-113
24. Member Ballinger asked if NMSS was interfacing with NRR license renewal staff to evaluate cask performance during extended periods and long term dry storage.	107

25. M. Tschiltz of NEI provided his perspective on the staff's RMRF efforts and his concern about limited public and industry involvement in the development of the potential options.	114-118
26. M. Tschiltz suggested that RMRF should be considered and prioritized through the joint Risk-Informed Steering Committee along with issues such as: treatment of uncertainty in decision making, aggregation of risk and development of external event PRAs.	117
27. E. Lyman of the Union of Concerned Scientists provided his perspective on the staff's RMRF efforts including the concept of risk minimization versus risk management.	119-123
28. Chairman Stetkar asked for public comments. There were none.	124
44. Chairman Stetkar asked the subcommittee for final comments.	125-127
45. Chairman Stetkar adjourned the meeting.	127

ACTION ITEMS	
Action Item	Reference Pages in Transcript
1. The Subcommittee suggested that the next meeting on this matter would be after the NRC staff's white paper has been issued and they have held the proposed public meeting.	127

#### Documents provided to the Subcommittee

1. NUREG-2150, "A Proposed Risk Management Regulatory Framework," April 2012 (ML12109A277)
2. Memorandum from Gregory B. Jaczko, "Evaluating Options Proposed for a More Holistic Risk-Informed, Performance-Based Regulatory Approach," June 14, 2012 (ML121660102)
3. SECY-13-0132, "NRC Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report," December 6, 2013 (ML13329A336)
4. SRM-SECY-13-0132, "NRC Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report," May 19, 2014 (ML14139A104)
5. Memorandum from Michael Snodderly, "Certified Minutes of the Meeting of the Reliability and PRA Subcommittee on October 17, 2014," dated January 20, 2015, Closed Meeting Not Publically Available
6. Federal Register 78 FR 70354, "Conceptual Example of a Proposed Risk Management Regulatory Framework Policy Statement," dated November 25, 2013 (ML13273A493)

# **Official Transcript of Proceedings**

## **NUCLEAR REGULATORY COMMISSION**

Title:                   Advisory Committee on Reactor Safeguards  
                              Reliability and PRA Subcommittee Meeting

Docket Number:     (n/a)

Location:             Rockville, Maryland

Date:                 Friday, February 20, 2015

Work Order No.:     NRC-1400

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
(ACRS)  
+ + + + +  
RELIABILITY AND PRA SUBCOMMITTEE  
+ + + + +  
FRIDAY, FEBRUARY 20, 2015  
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ROCKVILLE, MARYLAND  
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The Subcommittee met at the Nuclear  
Regulatory Commission, Two White Flint North, Room  
T2B1, 11545 Rockville Pike, at 8:30 a.m., John W.  
Stetkar, Chairman, presiding.

COMMITTEE MEMBERS:

JOHN W. STETKAR, Subcommittee Chairman  
RONALD G. BALLINGER, Member  
DENNIS C. BLEY, Member  
CHARLES H. BROWN, JR. Member  
JOY REMPE, Member  
MICHAEL T. RYAN, Member  
STEPHEN P. SCHULTZ, Member  
GORDON R. SKILLMAN, Member



DESIGNATED FEDERAL OFFICIAL:

MICHAEL SNODDERLY

ALSO PRESENT:

EDWIN M. HACKETT, Executive Director, ACRS

MICHEL CALL, NMSS

MARY T. DROUIN, RES

RICHARD DUDLEY, NRR

JOSEPH G. GIITTER, NRR

DONALD G. HARRISON, NRO\*

MARK D. LOMBARD, NMSS

ED LYMAN, UCS\*

JOSEPH RIVERS, NSIR

MICHAEL TSCHILTZ, NEI

\*Present via telephone

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

8:33 a.m.

CHAIRMAN STETKAR: The meeting will now come to order. This is a meeting of the Advisory Committee on the Reactor Safeguards Subcommittee on Reliability and Probabilistic Risk Assessment. I'm John Check -- John Stetkar, Chairman of the Subcommittee.

(Laughter)

CHAIRMAN STETKAR: It's cold and the mouth doesn't work well under optimum circumstances. Members in attendance today are Steve Schultz, Dick Skillman, Dennis Bley, Mike Ryan, Ron Ballinger and Joy Rempe. And I've been told we will be joined by Charlie Brown.

The purpose of today's meeting is to continue discussions on the status of the staff's plans for responding to direction from Chairman Jaczko to review NUREG-2150, a proposed Risk Management Regulatory Framework. And provide a paper that would identify options and make recommendations, including the development of a Commission Policy Statement.

The meetings are open to the public. This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act.

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1 Rules for the conduct of and participation in the  
2 meeting have been published in the Federal Register as  
3 part of the notice for this meeting.

4 The Subcommittee intends to gather  
5 information, analyze relevant issues and facts and  
6 formulate proposed positions and actions as  
7 appropriate for deliberation by the full Committee.  
8 Mr. Michael Snodderly is the designated Federal  
9 Official for this meeting.

10 A transcript of the meeting is being kept  
11 and will be made available as stated in the Federal  
12 Register notice. Therefore, it is requested that all  
13 speakers first identify themselves and speak with  
14 sufficient clarity and volume so that they can be  
15 readily heard. And I'll remind all of you to please  
16 silence all of your little beeping devices.

17 We have received a request to make oral  
18 statements from Michael Tschiltz of the Nuclear Energy  
19 Institute and Ed Lyman of the Union of Concerned  
20 Scientists. I understand that there may be  
21 individuals on the bridge line today who are listening  
22 in on the proceedings.

23 The bridge line will be closed and placed  
24 on mute so that those individuals may be listen in --  
25 may listen in. At the appropriate time later in the

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1 meeting, we'll have an opportunity for public comments  
2 from the bridge line and from members of the public in  
3 attendance. And also, we'll open the bridge line  
4 periodically.

5 I understand that there are members of the  
6 NRC staff also on a separate line that we'll make sure  
7 that we open that to have comments from you. Also, if  
8 any of the presenters want help from any of the staff,  
9 just let me know and we'll get that line open.

10 We'll now proceed with the meeting and I'll  
11 call upon Joe Giitter of the Office of Nuclear  
12 Regulation -- Reactor Regulation, to open the  
13 presentation. Joe?

14 MR. GIITTER: Thank you John. I  
15 appreciate the opportunity for the staff to come here  
16 and discuss their efforts in evaluating a possible Risk  
17 Management Regulatory Framework.

18 Since the NRC Commission issued PRA Policy  
19 Statement nearly 20 years ago, the staff has been slowly  
20 moving towards a more risk-informed approach to  
21 decision making. In the oversight area we rely on the  
22 significance determination process to determine the  
23 appropriate level of inspection.

24 In the licensing area we have made strides  
25 in risk-informing fire protection requirements and in

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1 improving change to allow outage times and surveillance  
2 frequencies. However, many of our regulations are  
3 still based on deterministic criteria that do not  
4 consider risk insights.

5 One of the main recommendations of the  
6 National Academy's report on the Fukushima accident is  
7 that the NRC should incorporate modern risk concepts  
8 into the regulations. And that the NRC and industry  
9 should strengthen their capabilities for identifying,  
10 evaluating and managing risks from beyond the found  
11 basis of that.

12 There may be no better time for the Agency  
13 to move toward an approach that would allow us to  
14 consistently consider risk in our decisions. We last  
15 discussed the Risk Management Regulatory Framework in  
16 the Subcommittee on October 17, 2014. At that meeting  
17 we described a two-phase effort focusing first on power  
18 reactors.

19 Then after obtaining Commission feedback  
20 on RMRF Options for power reactors, we planned to  
21 evaluate the merits of an Agency wide RMRF Policy  
22 Statement. And my understanding is that the  
23 Subcommittee was concerned that addressing power  
24 reactors first, might ultimately limit or constrain  
25 potential options for an Agency wide Policy Statement

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1 addressing all NRC regulated program areas.

2 Since last October, we've had a number of  
3 senior management meetings on this topic and are now  
4 pursuing a slightly different approach. We still plan  
5 to propose several RMRF power reaction implementation  
6 options to the Commission in the initial RMRF SECY  
7 paper. But we've also decided to ask for a Commission  
8 decision on whether we should also pursue an  
9 overarching Agency wide Risk Management Policy  
10 Statement. And you'll hear more about that from the  
11 staff today.

12 So, today we plan to present a brief  
13 overview of what an Agency wide Risk Management Policy  
14 Statement might contain. And an update on our power  
15 reactor implementation options. And then finally a  
16 summary of our plans to move forward.

17 And also, because we're now considering an  
18 Agency wide Policy Statement, we're also providing  
19 presentations on the status of risk-informing the  
20 program areas of security, spent dry fuel storage and  
21 other areas within our regulatory purview.

22 With that I'm going to ask Dick to go ahead  
23 and start the staff's presentation.

24 MR. DUDLEY: Thank you Joe. Starting  
25 with slide two. What I'm going to talk about is just

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1 the background and the current approach. First I'll  
2 describe a little bit of what we're thinking on the  
3 Agency wide policy statement. Then I'll discuss the  
4 implementation options for Risk Management Regulatory  
5 Framework for Power Reactors that we're currently  
6 considering. And Then I'll briefly touch on our plans  
7 to move forward.

8 After I speak, Joe Rivers will talk about  
9 the status of risk-informed activities regarding  
10 common defense and security. Following him Michel  
11 Call will talk about the status of risk-informed  
12 activities regarding dry spent fuel -- spent fuel dry  
13 storage. And also Michel Call will speak about the  
14 status of risk-informed activities regarding nuclear  
15 materials licensing.

16 Michael is sitting in for Dennis Damon who  
17 was on official travel. So detailed questions might  
18 not be -- if you have a detailed question and we can't  
19 answer it, we'll take it down and we'll get the answer  
20 back to Mike Snodderly to distribute to the  
21 Subcommittee.

22 On slide three, as Chairman Stetkar said,  
23 the Chairman's Tasking Memo of June 2012 directed the  
24 staff to review NUREG-2150 and provide a paper to the  
25 Commission that would identify options and make

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1 recommendations, including the potential development  
2 of a Commission Policy Statement.

3 Furthermore, the Commission's May 2004 SRM  
4 on Near Term Task Force Recommendation One, directed  
5 the staff to reevaluate our proposed Improvement  
6 Activities -- Improvement Activity One to establish a  
7 new design basis extension category of regulations.  
8 And Improvement Activity Two to define and establish  
9 criteria for adequacy of defense-in-depth to  
10 reevaluate those Improvement Activities within the  
11 context of the Commission's direction on a long term  
12 risk management regulatory framework.

13 The Commission's SRM also closed Near Term  
14 Task Force Recommendation One and it increased the  
15 scope of the RMRF SECY paper by adding a requirement  
16 that we describe the relationships between the ongoing  
17 risk-informed activities. As a result in the change  
18 of scope, the staff requested an extension of the due  
19 date for the RMRF SECY paper until December 2015.

20 And as Joe said, since we talked to you last  
21 in October, management has reevaluated our approach to  
22 evaluating an Agency wide risk management regulatory  
23 framework. And now we're currently considering three  
24 power reactor specific implementation options for a  
25 risk management regulatory framework. But we will

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1 also in parallel with that, this paper will ask the  
2 Commission to consider an overarching Agency wide risk  
3 management policy statement.

4 The next few slides are sort of an overview  
5 of what this policy statement might look like.

6 MEMBER BLEY: Dick, excuse me. Wasn't  
7 that part of your original charter?

8 MR. DUDLEY: To?

9 MEMBER BLEY: The Agency wide aspect of  
10 this.

11 MR. DUDLEY: I mean, that was -- that was  
12 the Chairman's Tasking Memo.

13 MEMBER BLEY: Yes.

14 MR. DUDLEY: Said to make recommendations  
15 regarding an Agency wide policy statement. That's  
16 correct. Or to consider that.

17 MEMBER BLEY: Okay. But now you're going  
18 back to the Commission to say there's a way we could  
19 do that or something?

20 MR. DUDLEY: Yes.

21 MEMBER BLEY: Okay.

22 MR. DUDLEY: And so what I'm going to  
23 describe in the next few slides are just of -- it's sort  
24 of a bulletized summary of what this might look like.  
25 We didn't want to spend too many resources developing

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1 a detailed policy statement and find out that the  
2 Commission didn't want us to spend all the resources  
3 to do that.

4 So, we're sort of walking a fine line  
5 between trying to get enough detail to describe to the  
6 Commission what such a policy statement might look like  
7 to allow them to make an informed decision. But yet  
8 not use up all -- expend a lot of resources on something  
9 and have them say well no, that's really not what --  
10 we didn't want you to do that. So, that's the balance  
11 we're trying to strike in evaluating the policy  
12 statement.

13 So, what we have is we believe that this  
14 policy statement of course would be applicable to all  
15 NRC regulated program areas, applying both to  
16 radiological safety and to security. We believe that  
17 -- a risk management approach would be used to ensure  
18 adequate protection of public health and safety and to  
19 promote the common defense and security for all Nuclear  
20 Regulatory activities.

21 In a risk management approach, safety and  
22 security are ensured by understanding the risks and the  
23 hazards associated with NRC regulated activities. And  
24 using that information to make regulatory decisions.  
25 Onto slide five.

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1           The risk management approach would use a  
2           structured process to identify issues, develop and  
3           analyze options and make decisions and monitor the  
4           effectiveness of Regulatory programs to -- and make  
5           appro -- go back and make improvements to them if we  
6           found that to be necessary.     It would ensure  
7           appropriate Regulatory controls and oversight are in  
8           place that recognize the variety of risks associated  
9           with the different uses of radioactive materials.

10           And it would employ risk-informed decision  
11           making in which risk insights of both qualitative risk  
12           insights and quantitative risk insights would be  
13           considered together with other non-risk factors  
14           commiserate with their importance to public health and  
15           safety and common defense and security.

16           MEMBER SKILLMAN:   Dick, may I ask you to  
17           go back to slide four please.

18           MR. DUDLEY:   Yes.

19           MEMBER SKILLMAN:   In your second bullet,  
20           you've identified safety independently from security.  
21           Isn't security a subset of safety?

22           MR. DUDLEY:   There is a safety/security  
23           interface where actions that you take to ensure  
24           security of a facility from external attacks or that  
25           sort of thing, there is a relationship between the two.

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1       Ultimately, a security event, the consequences would  
2       perhaps be radiological. Joe, do you want to --

3               MEMBER SKILLMAN: I'm well aware of that.  
4       What I'm trying to do is get clear in my mind what I  
5       think is a distinction that you're drawing here between  
6       safety, in terms of nuclear safety, SSCs, CDF, LERF,  
7       that type of thing. Contrasted against force on force,  
8       bad guys, terroristic threat to the facility or to fuel  
9       facilities. Is that the distinction you're making  
10      here?

11             MR. DUDLEY: It would -- well, we would --  
12      this policy would apply to both.

13             MEMBER SKILLMAN: But are you trying to  
14      have two policies or one policy?

15             MR. GIITTER: Dick, maybe I can take a stab  
16      at that. You know, the Agency's traditionally talked  
17      about safety and security separately. But of course  
18      we understand that security can be a subset of safety  
19      especially when you're looking to design basis threats.

20             For some facilities, Cat 1 facilities for  
21      example, for reactors it's radiological sabotage. But  
22      for Cat 1 facilities, you're concerned about theft and  
23      diversion of special nuclear material.

24             So, we do understand the nexus, the point  
25      you're raising. But traditionally, the Agency has

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1 discussed security, although it can be a subset of  
2 safety as you indicated, as something separate and  
3 distinct from security -- safety and security is two  
4 separate and distinct things. Although we understand  
5 the interrelationship.

6 MEMBER BLEY: Mr. Giitter though, it is  
7 traditional, I agree with you. But on at least three  
8 occasions over the last six, seven years, the  
9 Commission has issued SRMs urging the staff to  
10 integrate their concerns with safety and security.

11 MR. GIITTER: Yes, we agree.

12 MEMBER BLEY: Okay.

13 MEMBER SKILLMAN: Joe thank you.  
14 Understand. Dick, thank you.

15 MR. DUDLEY: Okay. On slide six now,  
16 under an Agency wide policy statement, the technical  
17 analysis supporting the risk management approach  
18 should be based on sound data, information and  
19 methodologies, including the consideration of  
20 uncertainties. It should use techniques or  
21 combinations of techniques that are appropriate for the  
22 hazards and the complexity of the issue.

23 It should be as realistic as practicable  
24 considering the specific application. And it should  
25 promote and utilize advances in science and technology

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1 as practicable.

2 MEMBER SKILLMAN: Dick, back to six  
3 please. Items one and two, at least in my view, have  
4 the attribute of metrics. You can measure them. You  
5 can figure out what you're talking about. You can put  
6 numbers, percentages, some form of measurable scale for  
7 one and two. Both three and four have the word  
8 practicable.

9 And what I see as practicable and what you  
10 see and what the other members of the public might see  
11 as practicable, might be vastly different. What can  
12 be done to make sure that there's a metrification there  
13 so that the measurement standard is understood and is  
14 defensible?

15 MR. DUDLEY: I think you've hit on the  
16 challenge. An Agency wide policy statement, we have  
17 certain programs where we have quantitative tools and  
18 safety goals. And we have other programs which rely  
19 more on qualitative risk assessments. I can't really  
20 tell you how we're going to bring them or even if we  
21 can bring them all into a quantitative arena.

22 I don't believe that is likely possible.  
23 But what you hit on I think, is the major challenge of  
24 an Agency wide policy statement.

25 MEMBER SKILLMAN: Are we pumping against

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1 the tide? Is this a go nowhere riddle that we're going  
2 to be involved in?

3 MR. DUDLEY: No, I don't think so. I mean  
4 we can certainly address activities in a quantitative  
5 fashion if that's appropriate. In a qualitative  
6 fashion if quantitative tools are not yet available.

7 MEMBER SKILLMAN: Okay. Thank you.

8 MS. DROUIN: This is Mary Drouin.  
9 Another way to look at that third bullet and  
10 interpreting the work practical, is that not every  
11 analysis that we do needs to be completely realistic.  
12 You know, there will be some analysis because of how  
13 you're applying it, you don't need to be as realistic.

14 So this is you know, be as realistic as it's  
15 commiserate with the application or the decision that  
16 you're trying to support.

17 MEMBER BLEY: That makes sense to me Mary.  
18 And if I look up the work practicable, it just means  
19 is it possible to do it, right. What you're saying is,  
20 does it make sense? Which is a different concept. And  
21 if that's where you folks are headed, maybe you ought  
22 to polish up the language a little.

23 MR. DUDLEY: I haven't looked up  
24 practicable in the dictionary. I need to do that and  
25 maybe we want a different word.

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1 MS. DROUIN: Yes. And recognize that you  
2 know, all these bullets that Dick has put up there, we  
3 will envision that over time you know, as we have more  
4 dialog, among the staff, as we go out for public review  
5 and comment. You know, these words are going to be  
6 massaged and worked through. This is not the end  
7 product that you're seeing here.

8 MEMBER RYAN: One thing that might be  
9 helpful, and I'm sure others will have, you know enjoy  
10 seeing a glossary that takes all these terms,  
11 practicable, practical, you know, any one of two or more  
12 dozen words you want to define to help give people at  
13 least some idea of what your intention for the meeting  
14 is and the document. I think that would be a useful  
15 addition.

16 MR. DUDLEY: Again, I want to emphasize,  
17 this is our very first draft.

18 MEMBER RYAN: Sure.

19 MR. DUDLEY: It's very early on. There  
20 will be multiple levels of management review. Clearly  
21 if the Commission supports such an approach, just what  
22 you said, we'll have to dissect these words very  
23 carefully. We'll have to have them clearly defined.

24 But at this point, we're just not there.  
25 We're trying to give the Commission enough of an idea

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1 of what this policy might look like so that they can  
2 make an informed decision as to whether or not they want  
3 the staff to pursue it. But yet, not use too many  
4 resources to develop a policy statement that perhaps  
5 the Commission chooses not to have us do.

6 MEMBER RYAN: Well, that's a fair way to  
7 look at it. Yes. And to proceed.

8 MR. DUDLEY: Right.

9 MEMBER RYAN: Thank you.

10 MR. DUDLEY: Great.

11 MS. DROUIN: This is Mary Drouin again.  
12 Your point is very well taken. And the working group  
13 has started a glossary you know, on this. So, we have  
14 anticipated that and there's already some terms that  
15 we have defined and we are actually starting a glossary.

16 MEMBER RYAN: Okay, great.

17 MS. DROUIN: And I think Dick has that as  
18 a backup slide.

19 MR. DUDLEY: Yes, we have defined a number  
20 of terms.

21 MEMBER RYAN: Excellent.

22 MR. DUDLEY: And practicable or perhaps  
23 some other adjective would be added to that if that's  
24 not the right word.

25 On slide --

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1                   MEMBER SCHULTZ:     Dick, before we go  
2 forward.

3                   MR. DUDLEY:    Yes?

4                   MEMBER SCHULTZ:   In the last -- in these  
5 three slide where you've talked about the statement and  
6 then the approach and technical analysis, in order to  
7 get to the point where this is being utilized beyond  
8 the evaluation and then getting into decision making,  
9 are we also promoting an approach that would be  
10 evaluating comparative risks associated with the  
11 technology and the decisions and so forth? In order  
12 to make good decisions related to this technology, the  
13 nuclear technology versus other technology?

14                  MR. DUDLEY:    You mean comparing nuclear to  
15 this?

16                  MEMBER SCHULTZ:   Well, establishing the  
17 metrics that would allow decision making to happen. We  
18 haven't talked about that. It's not talked about here,  
19 establishing the goals and objectives.

20                  MR. DUDLEY:    That's correct. That will  
21 be easier to do for some programs then for others. And  
22 again, that was Member Skillman's point I think. We  
23 clearly have quantitative tools and safety goals for  
24 certain regulated areas. We have qualitative tools  
25 and goals in other regulated areas.

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1 I am not sure if all regulated areas will  
2 ever make it to qualitative tools and acceptable levels  
3 of risk.

4 MEMBER SCHULTZ: You mean quantitative?

5 MR. DUDLEY: Quantitative, um-hum.

6 MEMBER SCHULTZ: Quantitative then.

7 MR. DUDLEY: Quantitative, I apologize,  
8 yes. I'm not sure that those who have qualitative  
9 tools and measures will make it into quantitative. So  
10 I can't necessarily -- perhaps your question was can  
11 you compare risk from one regulated area to another  
12 regulated area using the same scale? Was that where  
13 you were coming from?

14 MEMBER SCHULTZ: Well, I'm focusing on the  
15 attribute of decision making. And you can do  
16 comparative evaluations and analysis. But all of this  
17 appears to be in internal focus associated with what  
18 is being done within this Agency. And I'm also looking  
19 for an understanding of what is done outside the Agency  
20 in terms of the same types of decision making. I'm not  
21 seeing it here.

22 MR. DUDLEY: I mean, if one -- if you're  
23 postulating tools that would allow one to compare the  
24 risk to the public from electrical power generated by  
25 nuclear versus risk to the public of electrical power

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1 generated by burning coal, we're not going to be doing  
2 that. I personally think that would be very  
3 interesting. I have seen some studies on that.

4 But, that's not I think within -- I don't  
5 have an OGC representative here. But I don't know that  
6 that's within our charter.

7 MR. GIITTER: Yes Dick, just let me try to  
8 clarify a little bit. For the harm part of Agency wide  
9 policy statement, that was not envisioned. We do that  
10 as you know of course, to a certain extent with the  
11 safety poll policy. But whether we would do that would  
12 certainly -- would be a Commission decision, a policy  
13 decision.

14 But it's currently not something that's  
15 envisioned for RMRF at this point.

16 MEMBER SCHULTZ: Thank you.

17 MR. DUDLEY: That concludes the very --  
18 the preliminary work that we've done regarding an  
19 Agency wide policy statement. We -- the management  
20 decision to pursue that was made in January.

21 So we haven't been looking at this very  
22 long. So it is --

23 MEMBER BLEY: Just last month? January?

24 MR. DUDLEY: Yes. That's correct. So  
25 and it is very preliminary.

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1 CHAIRMAN STETKAR: You have circulated a  
2 draft policy statement back last year, didn't you? For  
3 comments? Or did the -- I guess I never -- no, it was  
4 released.

5 MR. DUDLEY: There was one published, a  
6 risk management. Yes, that's correct.

7 CHAIRMAN STETKAR: Did you get public  
8 feedback on that?

9 MR. DUDLEY: Yes, we did.

10 CHAIRMAN STETKAR: Okay.

11 UNKNOWN: And?

12 MR. DUDLEY: I answered the question.

13 CHAIRMAN STETKAR: And I didn't follow up  
14 and silence is interpreted as move on quickly.

15 (Laughter)

16 MR. DUDLEY: No, seriously I -- I'm  
17 assuming we -- I think this Committee, this  
18 Subcommittee was very pleased with the work.

19 CHAIRMAN STETKAR: Yes. We were briefed  
20 on it in that October meeting.

21 MR. DUDLEY: Right. So yes, this  
22 Committee was pleased with that. There were other  
23 members of the public that perhaps were not so  
24 supportive. But -- so feedback was mixed. But yet as  
25 you say, this Subcommittee was very positive with

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1       respect to that policy statement.

2                   CHAIRMAN STETKAR:   Okay.   Thank you.

3                   MR. DUDLEY:       Okay.     The slide seven  
4       starts the three power reactor risk management  
5       regulatory framework implementation options that we  
6       are currently considering.   Option One is to maintain  
7       our existing current regulatory framework.

8                   Option Two would be to institute a  
9       voluntary,   alternative,   risk-informed   licensing  
10      basis.   And Option Three would be a plant specific risk  
11      management regulatory framework, essentially the  
12      framework recommended in NUREG-2150 for power  
13      reactors.

14                  These three Options were also described to  
15      you essentially in the same form when we came here in  
16      October.   But when we were here in October, we had a  
17      fourth option that we have dropped.   The option that  
18      we had, that we dropped, was to continue to risk-inform  
19      our regulations on a generic basis.

20                  That activity includes things like  
21      finishing up 5046(a), the risk-informed ECCS rule.  
22      Maybe looking at the coupling LOOP from LOCA.   And  
23      under that Option we were going to more aggressively  
24      and more thoroughly go through our regulations and see  
25      if there are others that could be risk-informed on a

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1 generic basis.

2 I don't know that that would have been  
3 successful. Ultimately management decided we would  
4 drop that Option to simplify the paper.

5 CHAIRMAN STETKAR: In a sense, one could  
6 argue that's part of Option One anyway, right?

7 MR. DUDLEY: You could argue that under  
8 Option One, we've gone about as far as we can go.

9 CHAIRMAN STETKAR: Okay.

10 MR. DUDLEY: And I think that probably is.  
11 At least that's my view. By the time we complete  
12 5046(a), and then perhaps look again at LOOP --  
13 separating LOOP from LOCA.

14 Any other questions?

15 (No response)

16 MR. DUDLEY: Okay. So those are the three  
17 Options. Our description of these three Options  
18 should essentially be similar to the description that  
19 we gave you back in October.

20 Under maintain the current regulatory  
21 framework, we would not revise our framework. We  
22 believe and even NUREG-2150 states, in Chapter 4,  
23 Option A, that the current power reactor regulatory  
24 framework meets the criteria for a risk management  
25 regulatory framework.

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1           We have the Commission Safety Goal Policy  
2           statement which sets forth a risk management objective.  
3           Our current regulations implement sufficient  
4           protection, defense-in-depth and safety margins that  
5           they would provide, that would correspond to meeting  
6           the 2150 risk management goal.

7           NRR has a licensing instruction, LIC-504,  
8           which has a risk-informed decision making process in  
9           it very similar to the one recommended in NUREG-2150.  
10          And in addition, the NRC has numerous monitoring and  
11          feedback mechanisms that we use to gauge the efficacy  
12          of our regulatory decisions and to identify new  
13          information that should be considered within the  
14          regulatory framework.

15          And I believe when I met with this  
16          Subcommittee once before to talk about Near Term Task  
17          Force Recommendation 1, we had a little over an hour  
18          presentation where we talked to you about our existing  
19          programs that do this. The Operating Experience  
20          Program, the Generic Issues Programs, the Agency Action  
21          Review Meeting. So, we have discussed these programs  
22          with this Committee before.

23          And finally, we like to always emphasize  
24          that maintaining our current regulatory framework is  
25          not a do nothing option. Under our current framework,

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1 we have complete freedom to make safety improvements  
2 based on risk insights or whatever considerations we  
3 would choose whenever it's deemed necessary. And we  
4 can make changes using our existing regulatory  
5 processes.

6 CHAIRMAN STETKAR: But I think that just  
7 for the record that does tend to be more of an ad hoc  
8 process, issue specific, rather than a comprehensive  
9 integrated Agency wide approach.

10 MR. DUDLEY: It is --

11 CHAIRMAN STETKAR: Even within the narrow  
12 focus that you've emphasized here, even within the  
13 power reactors area.

14 MR. DUDLEY: I would say that's correct.

15 CHAIRMAN STETKAR: Okay.

16 MR. DUDLEY: I would not disagree.

17 Power Reactor Option Two. Under Option  
18 Two, the Voluntary Alternative Risk-Informed Licensing  
19 Basis, we would maintain our existing generic  
20 regulatory structure as it is, but we'd issue a rule  
21 allowing licensees who volunteer or choose to upgrade  
22 their PRAs. They could apply for approval of a  
23 licensing basis that would support a performance based,  
24 risk-informed alternative to certain deterministic  
25 regulations that their PRA would show might have low

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1 safety benefit at their specific facilities.

2 So these licensees would be allowed to  
3 select a plant specific set of design changes or  
4 compliance issues, shown to be of low risk, from which  
5 they could deviate from our current deterministic  
6 requirements. Some of these would require NRC  
7 approval. Some of this might allow -- in some cases  
8 we might allow licensees to approve low risk changes  
9 themselves without our approval, as long as they also  
10 search for and mitigate all plant specific risk  
11 vulnerabilities that would meet NRC specified  
12 criteria.

13 So, if you want to take this approach and  
14 do your PRA and try to reduce or eliminate some low risk,  
15 significant requirements, you will have had to look for  
16 risk outliers and other things that maybe have specific  
17 risk at your facilities, even though they're in  
18 compliance with the current regulations. You would  
19 then have to under this alternative, mitigate that risk  
20 before you could then take the benefit of making the  
21 facility changes to change the existing deterministic  
22 requirements that were not risk significant at your  
23 facility.

24 MEMBER BROWN: Isn't this -- the first --  
25 the second measure bullet, I guess it -- that sounds

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1       like part of the prioritization type stuff where you  
2       have -- I mean that's -- I'm just connect -- trying to  
3       connect the dots with these. They sound very similar  
4       where you can avoid safety benefit, you can then  
5       prioritize and do some stuff on a lower level basis then  
6       you did as a --

7                   MR. DUDLEY:     They are.     There is a  
8       similarity.

9                   MEMBER BROWN:   Okay.   I mean, is that --  
10      why is the prioritization separated out? I know we're  
11      going to do that this afternoon, but --

12                  MR. DUDLEY:     These activities are  
13      related. Prioritization is the first step.

14                  MR. GIITTER:   Yes, let me try to address  
15      that. What you're going to hear this afternoon is  
16      focused primarily on -- at least initially, on  
17      scheduling. So if licensing has a modification in  
18      front of them, whether it's something they're required  
19      to do or something that they are taking it upon  
20      themselves to do because they think it's going to  
21      improve their reliability at the plant, they will --  
22      it provides a methodology for them to make decisions  
23      on what should come first. And what can be deferred  
24      to later.

25                  What we're talking about here, similar in

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1 concept because you're using risk insights to determine  
2 what's more important, but fundamentally it's  
3 different in that we're looking at actual changes to  
4 the license and the licensing basis for the plant. So  
5 it's a more permanent and substantial change than the  
6 risk prioritization effort that you'll hear about this  
7 afternoon.

8 MEMBER BROWN: Okay. Thanks.

9 MEMBER REMPE: If I compare Option Two and  
10 Option Three, and I know you've not fleshed out all the  
11 details, but in your mind, it would be the same amount of  
12 upgrades to the PRA be needed for Option Two and Option  
13 Three?

14 MR. DUDLEY: Let's see, I'm -- I'm not  
15 sure.

16 MR. GIITTER: That's -- yes, I can talk a  
17 little bit about that. We envision that there's going  
18 to be upgrades to the PRA required for both Option Two  
19 and Three. It may be a matter of degree.

20 For Option Two, certainly you're going to  
21 have to upgrade your PRA to a level that is necessary  
22 in order to make the right decisions. In other words,  
23 if you're looking at what all of the hazards are for  
24 the facility, you're going to need to have external  
25 event models for example. You'd need to understand how

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1 they play in.

2 Now whether you actually have to do for  
3 example, a flooding PRA or something like that, there  
4 may be some flexibility in how you do that. You may  
5 be able to because right now the state of the art doesn't  
6 really support flooding PRA. You may be able to use  
7 qualitative insights or some other methods similar to  
8 what we did for the IPEEE to make those kind of  
9 decisions.

10 But you are going to have to have  
11 information necessary in order to make the right  
12 decision. Whatever that decision might be.

13 MEMBER REMPE: Okay. Thank you.

14 MS. DROUIN: Let me just also add to that.  
15 It's also going to be dependent on what your acceptance  
16 criteria is. I mean in Option Two, you may keep your  
17 acceptance criteria for example to reactors CDF and  
18 LERF. Or maybe you know, just to release those. So  
19 then you'd only require you know, a level two.

20 Now the level of detail in the scope that  
21 goes with it would probably increase. But when you go  
22 to Option Three, you know, if you're starting to talk  
23 about using for example a frequency consequence curve,  
24 then you're talking about having to do a level three  
25 PRA. Versus just keeping your PRA the CDF and LERF.

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1                   MEMBER SKILLMAN:   Dick, let me make an  
2                   observation and then ask a question.   Option Two  
3                   provides what I view as a very great benefit to  
4                   licensees.   But, I spent about ten years consulting.  
5                   And most of my consulting was engineering effectiveness  
6                   in relationship of engineering for the plant culture.  
7                   Whether it's the work management program or operations.

8                   And what I observed in those ten years is  
9                   some plants that were very well run, there was a very  
10                  strong relationship between the corrective action  
11                  program, their work management program and just an  
12                  honest to goodness understanding of Appendix B to 10  
13                  CFR 50.   All 18 points, including record keeping and  
14                  configuration control.

15                 And unless a licensee is firmly set on a  
16                 configuration control program that ensures the plant's  
17                 configured the way it's supposed to be and its  
18                 documentation shows that configuration, unless the PRA  
19                 model reflects the current configuration, this can be  
20                 a red herring.   Because they can be asking for change  
21                 under what they believe to be an appropriate PRA model  
22                 when the plant isn't reflective at all of that model.

23                 So my question is, what is the discipline  
24                 that ensures that before an option like this is granted  
25                 to a licensee, they are really where they are supposed

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1 to be in configuration control, commitment to 10 CFR  
2 50, Appendix B? They are really doing it?

3 MR. DUDLEY: Well, we have a very active  
4 reactor oversight program and onsite inspectors. And  
5 I think that's the tool that we would use. And that  
6 we are using right now.

7 MEMBER SKILLMAN: Do you believe that's  
8 effective?

9 MR. DUDLEY: I'm not an expert on the  
10 oversight program. I can't speak to that. I assume  
11 it's effective or we would be improving it. But I think  
12 our existing oversight program is likely adequate for  
13 that. If you would like us to get some additional  
14 information or if you're at a future meeting, something  
15 about that, we can put that together for your. But --

16 MEMBER SKILLMAN: That is not really what  
17 I'm driving towards. What I'm driving towards is the  
18 notion that if Option Two were to become a viable option  
19 that there needs to be part of that Option Two a  
20 recognition of the importance of compliance with the  
21 other regulations that ensure that the plant  
22 configuration and the PRA model are in alignment.

23 MR. DUDLEY: So perhaps what you're  
24 suggesting is, if the plant implemented Option Two, one  
25 of the conditions of that might be a special inspection

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1 prior to that approval to make sure that their actual  
2 configuration was consistent with the configuration  
3 that was modeled in the PRA. Maybe that's something  
4 we should consider.

5 MR. GIITTER: Well, yes, Dick let me just  
6 -- I agree with your comment. And with any model or  
7 PRA model, it's only as good as the understanding of  
8 how the systems operate, your ability to model systems,  
9 failure modes of course. So, that is critical.

10 And how that's done, it's a very good  
11 point. I don't know that we would necessarily want to  
12 do a detailed PRA inspection. I mean, that's certainly  
13 a possibility we could look at. But there are -- it  
14 is something that we would have to have a high degree  
15 of assurance that the PRA model is -- represents the  
16 plant condition.

17 And there are -- and then Mary can talk  
18 about this more. You know, there are peer reviews that  
19 are done of course anytime you upgrade your PRA. That  
20 doesn't go into the level of detail that you're talking  
21 about. But -- so this is a very good point and it's  
22 something we'll take into consideration.

23 MEMBER SKILLMAN: Can I just -- let me make  
24 one more point. The real concern I have is that the  
25 more clever your team is at the site -- the more clever

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1 the operating team and the engineering team is at the  
2 site, the potential for gaming the system increases.  
3 And it's that that I'm really both aware of and  
4 concerned about.

5 I think it's great to give the licensees  
6 freedom to use a PRA tool to reduce perhaps the burden  
7 where the value of some of the issues that they are  
8 protecting against is very low. I understand that  
9 concept. But I also am aware of organizations that  
10 have the potential to game the system.

11 And hence there needs to be at least in my  
12 mind, the ability to make sure that the rigor and  
13 discipline are there. So that a freedom is given on  
14 Option Two, we are confident that the licensees are  
15 where they're supposed to be. That's what I'm saying.

16 MR. DROUIN: One thing to note is that you  
17 know, there is the PRA standard now. You know, we have  
18 reviewed that standard and endorsed it in one point or  
19 another. If the Commission decided to go forward with  
20 Option Two, we would have to relook at that standard  
21 you know, in the light of does it provide us enough that  
22 we're going to have the right technical acceptability  
23 in that PRA to support an Option Two.

24 Now one part of the standard is not just  
25 the technical requirement for doing the PRA. A big

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1 piece of that standard is the configuration control of  
2 that PRA. So the standard does get into requirements  
3 you know, of how to you know, maintain the configuration  
4 of the PRA such that it appropriately reflects you know,  
5 the design and operation of the plant.

6 So we would have to -- we would go back and  
7 look at those requirements and make sure that those are  
8 strong enough, you know, to support this kind of  
9 application.

10 MEMBER SKILLMAN: Thank you Mary, Joe,  
11 Dick.

12 MEMBER SCHULTZ: So, again, that gets to  
13 the PRA and the analysis portion of the discussion that  
14 Dick was raising. And I think what you're saying Dick,  
15 is that the other important parts of this are the  
16 relationship of that particular analysis to the  
17 configuration control, the maintenance, the plant  
18 programs, including operations and training and all of  
19 those elements that result at the analysis for the PRA  
20 for that facility.

21 But also maintain it over the lifetime of  
22 the plant, which is what we're asking the licensee to  
23 do here.

24 MEMBER SKILLMAN: Yes, let me give you a  
25 word picture that might even be more clear. I worked

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1 at a plant where the plant changed from their old  
2 electrical load model, I think it was ohms to ETAP.  
3 ETAP is the we're told and is a very, very complicated,  
4 very detailed program. It's probably on a par with  
5 BRA. ETAP is a very complicated program.

6 In this particular plant, ETAP, this  
7 Electrical Transient Assessment Program, was being  
8 maintained by a college coop three months of the year.  
9 And it was the flagship program for protecting the load  
10 configuration at this particular nuclear power plant.

11 And so the leadership of that plant had  
12 determined that it was acceptable for a part time  
13 college student to maintain the database. And that's  
14 the program upon which ECCS loading, current flows,  
15 breaker protection, breaker relay alignment was  
16 established. And that was an alarming finding.

17 But it was so deep in the culture, one had  
18 to really dig for it.

19 MS. DROUIN: I think you raise excellent  
20 issues. And these are you know, some of the challenges  
21 that are going to be faced. I'm not trying to harp on  
22 this standard. It does require the licensee to develop  
23 a PRA configuration control program. It doesn't get  
24 into details.

25 But what that might translate to mean is

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1 that we as the NRC may need to come back and write a  
2 perhaps a Regulatory Guide to give accept -- you know,  
3 our acceptable staff position of what constitutes an  
4 acceptable PRA configuration control program.

5 So these are all you know, questions that  
6 you know, we're going to have to explore and answer.

7 MEMBER SKILLMAN: Okay. Thank you Mary.  
8 Thank you Dick.

9 MR. DUDLEY: Back to slide nine. So,  
10 licensees who would choose this alternative would have  
11 to go out and look for risk outliers or plant specific  
12 vulnerabilities. And meeting NRC specified criteria  
13 and mitigate them even if they were in compliance with  
14 our existing deterministic regulations.

15 And so things that those licensees find,  
16 new information on the mitigation of these events or  
17 sequences would have to be documented. And they would  
18 become part of their FSAR in accordance with the  
19 50.71(2) FSAR update requirements.

20 And we also, licensees taking this option  
21 would have to implement mandatory, monitoring and  
22 feedback as described in Reg Guide 1.174 to ensure that  
23 the changes and risks which were deemed acceptable at  
24 the time that they were made, to ensure that they remain  
25 acceptable over the lifetime of the facility.

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1                   Now monitoring and feedback would perhaps  
2 catch issues with maintenance. In other words if there  
3 are maintenance inadequacies at the plant, licensees  
4 would have to track the reliability of certain  
5 equipment. And if the reliability of that equipment  
6 was different then what was assumed in their PRA, they  
7 would have to go back and recalculate and make sure that  
8 the change in risk was acceptable associated with this  
9 change throughout the life of the plant.

10                   And so, that might require them to increase  
11 the reliability of certain equipment and change the  
12 maintenance. Or make some other corresponding change  
13 in the facility to reduce risk to an acceptable level.

14                   CHAIRMAN STETKAR: And I realize these are  
15 basically pretty high level talking points at the  
16 moment. But the -- when I look at Option Two and I think  
17 about Option Two that and, which you have appropriately  
18 highlighted in red there, meeting NRC specified  
19 criteria, that to me sounds an awful lot like the --  
20 if you ever get to it, Option Three, the RMRF framework  
21 that says well, below some area we feel the risk is  
22 acceptable.

23                   So therefore, that -- is that the notion  
24 of these NRC specified criteria? Or is this left up  
25 to the NRC saying well, despite the fact that we know

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1       that large LOCAs aren't important to risk, we still  
2       think you need to have certain criteria for large LOCAs?

3               MR. DUDLEY:   Well, no, I mean --

4               CHAIRMAN STETKAR:   Because that -- so I'm  
5       trying to understand what the notion of these NRC  
6       specified criteria are.     Are you setting the  
7       acceptable risk thresholds?

8               MR. DUDLEY:   Well I mean -- Joe, can you  
9       give your example about the fire protection inspections  
10      and the vulnerability that was uncovered under  
11      NFPA-805?

12              MR GIITTER:   Oh okay.   Well, there's --

13              CHAIRMAN STETKAR:   I'm not talking about  
14      the second point of identifying vulnerabilities.   I'm  
15      talking about the notion that the NRC is going to  
16      specify some sort of threshold criteria.

17              MR. DUDLEY:   We would have to -- it  
18      actually probably would be two thresholds.   We'd have  
19      to figure out what's the threshold that you have to take  
20      action?   And then what is the -- then it might be a  
21      different threshold that you have to reduce the risk  
22      to.

23              So, that's an implementation detail that  
24      we don't have at this point.

25              CHAIRMAN STETKAR:   Right, but in the

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1       notion of if I look at 2150, that to me starts to sound  
2       like the three kind of bands in 2150, isn't it?

3               MR. GIITTER:   There are similarities to  
4       2150.

5               CHAIRMAN STETKAR:   Okay.

6               MR. GIITTER:   The biggest difference  
7       John, is that we're looking at Option Two as an option  
8       in between the do nothing option and full  
9       implementation of RMRF.

10              CHAIRMAN STETKAR:   Sure.   Sure.

11              MR. GIITTER:   And so Option Two does  
12       include an incentive if you will for licensees to move  
13       towards a more risk-informed framework where I'm not  
14       sure that Option Three does that as well.   Especially  
15       if it requires development of a level three PRA.

16              But there are similarities.   And the point  
17       there, without getting into a lot of detail, is if  
18       licensees are going to identify deterministic  
19       requirements of low risk significance, whatever it  
20       might be, tornado, missiles, or you know, who knows.  
21       Then they should also seek out and look for risk  
22       outliers.

23              So we don't -- what we're saying is we  
24       shouldn't allow licensees to -- it's an untoward.   You  
25       don't want them to just take advantage without looking

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1 holistically at okay, with the clearer picture of risks  
2 that I now have, are there things that are treated in  
3 a deterministic world in my -- that we might do  
4 differently based on some risk insights.

5 CHAIRMAN STETKAR: I understand that  
6 completely. And I'm obviously running the NFPA-805  
7 stuff in the back of my head. And people who went  
8 through that exercise indeed did find vulnerabilities  
9 that their deterministic 10 CFR 50, Appendix B stuff,  
10 nobody even thought about.

11 MR. GIITTER: Right.

12 CHAIRMAN STETKAR: What I'm curious about  
13 though is, if I use that analogy, when you say that they  
14 must mitigate all plant specific risk vulnerabilities,  
15 meeting NRC specified criteria, do you have an example  
16 of what that means in the context of NFPA-805? Because  
17 NFPA-805 just looked at Reg Guide 1174.

18 MR. GIITTER: Right.

19 CHAIRMAN STETKAR: It said you know, if  
20 you --

21 MR. GIITTER: Right.

22 CHAIRMAN STETKAR: In that context, you  
23 use that basically as your metric for determining  
24 whether or not the change was acceptable to the state.

25 MR. GIITTER: And really, what we're

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1 envisioning here is something very similar to what we  
2 did for NFPA-805.

3 CHAIRMAN STETKAR: Okay. Okay. That's  
4 -- I was hoping that's what those words meant.

5 MR. GIITTER: Yes, I --

6 CHAIRMAN STETKAR: And their capability.

7 MR. GIITTER: Right.

8 CHAIRMAN STETKAR: Okay. Because you got  
9 into the 1174 in terms of the monitoring and feedback  
10 and all of that part of the process. I was just kind  
11 of hanging up on those criteria. Thanks.

12 MR. DUDLEY: On slide ten now. This is  
13 still Option Two. And this is kind of what you wanted  
14 to hear. The regulatory processes under Option Two for  
15 self approval of certain plant specific changes would  
16 be similar to NFPA-805 approval process.

17 Which I believe risk-informed changes are  
18 allowed to license requirements without prior NRC  
19 approval if the change in risk -- the increase in risk  
20 where changing CDF is no more than minimal, less than  
21 ten to the minus seven per year. And changes with risk  
22 increases more than minimal would require NRC approval.

23 Plant licensees are expected to have an  
24 upgraded, high quality PRAs to support this  
25 risk-informed alternative licensing basis approach.

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1 We haven't defined exactly what that is. And we would  
2 submit --

3 CHAIRMAN STETKAR: Well, but you have in  
4 the sense of Reg Guide or in the sense of NFPA-805. I  
5 mean they're basically supposed to comply with Reg  
6 Guide 1.200, which you know, endorses the ASME NS  
7 standard.

8 So, there is precedent to -- for  
9 understanding of what that upgraded, high quality PRA  
10 means. In current regulatory space. I mean, this  
11 isn't something that needs to be -- you might -- as Mary  
12 said, you might want to elaborate on some particular  
13 issues. But this isn't something that needs to be  
14 crafted out of nothing.

15 MR. DUDLEY: Are there any more questions  
16 on Power Reactor Option Two?

17 (No response)

18 MR. DUDLEY: Okay. Option Three is the  
19 recommended compliant specific, risk management  
20 regulatory framework implementation option from  
21 NUREG-2150. Under Option Three we would require  
22 operating licen -- all operating plants to have PRAs  
23 and upgrade them periodically. And establish -- and  
24 use them to establish a plant specific licensing base  
25 basis, which would be based on their plant specific risk

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1 profiles and NRC specified risk management -- an NRC  
2 specified risk management objective.

3 We would require licensees to use a  
4 structured risk-informed decision making process. We  
5 would require that both for licensees and for the NRC  
6 under Option Three. And based on the plant specific  
7 risk profile, licensees could implement the plant  
8 specific licensing basis by determining how they want  
9 to meet the risk objective.

10 Then they would have to ensure that the  
11 necessary protections are in place to meet the risk  
12 management goal. They'd have to establish the  
13 risk-informed decision making process. And they'd  
14 have to establish the monitoring and feedback process.  
15 And there would also have to be a reporting process  
16 associated with this plant specific approach.

17 Let me go to the next slide before the  
18 questions start. Because I might answer some of them.

19 (Laughter)

20 MR. DUDLEY: So each plant's licensing  
21 basis would consist of technical requirements that  
22 would be based upon this plant specific attributes.  
23 And applicant selected design specific elements. It  
24 would include the rationales or the technical basis for  
25 why the technical requirements adequately address risk

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1 and defense-in-depth in light of the plant specific  
2 attributes and design elements.

3 And FSAR level description of the plant  
4 specific attributes and the applicant selected design  
5 elements would -- and the input assumptions for the  
6 above rationales would also have to be maintained. And  
7 the process for maintaining the validity of the  
8 rationales, the technical basis through the lifetime  
9 of the plant would also have to be included in this  
10 plant's licensing basis.

11 So licensees would be required to use the  
12 structured process with monitoring and feedback to  
13 ensure that the plant specific licensing basis remained  
14 consistent with the risk profile of the plant, which  
15 could change over time.

16 MEMBER SKILLMAN: Dick, let me ask. Just  
17 conceptually, how would this be implemented? There  
18 are what about 67 sites, 104 plants, 100 plants? All  
19 part 50 plants are designed to Appendix A. Part 50  
20 plants are designed to Appendix A at 10 CFR 50.

21 Does the first bullet imply some form of  
22 change to that?

23 MR. DUDLEY: This implementation approach  
24 could result in I could think significant differences  
25 between the design of one plant to another plant.

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1 Plants that were initially identical might end up with  
2 designs that are significantly different.

3 CHAIRMAN STETKAR: Plants have designs  
4 that are different. They might have different  
5 licensing basis. But because of the differences in  
6 those designs --

7 MR. DUDLEY: Their licensing basis could  
8 change and they -- that might include changes in the  
9 design. In certain aspects of the design.

10 MEMBER SKILLMAN: I'm confused. I don't  
11 understand those words. I understand what John said.

12 MR. GIITTER: Yes, let me try to clarify  
13 it a little bit. Every plant now pretty much has a  
14 unique licensing basis even though we you know.

15 MEMBER SKILLMAN: Right. Sure.

16 MR. GIITTER: So, it isn't as radical as  
17 it may sound. But this approach would allow some sites  
18 to have a more risk-informed licensing basis then other  
19 sites. And so you would have some variability if you  
20 take for example two standardized plants, which we  
21 really don't have any in the United States, but  
22 theoretically if we did, one could have a risk-informed  
23 licensing basis, the other one might have a licensing  
24 basis that's largely deterministic.

25 And so I -- and we have that today, okay.

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1 We have plants that have transitioned to NFPA-805 that  
2 have made modifications to the plant. They've added  
3 additional auxiliary feed water trains, non-safety  
4 grade. And then you have plants that are  
5 deterministic.

6 Well, so you might have a four-loop  
7 Westinghouse plant with -- I'm getting into too much  
8 detail here, but with two motor-drive aux feed pumps  
9 and a turbine driven aux feed pump. And you might have  
10 another plant that because of the vulnerability of fire  
11 in a particular area of the plant, they might have an  
12 additional non-safety grade aux feed water pump that  
13 the other plant doesn't have.

14 So there will -- Dick's right, there will  
15 be design differences. But you know, fundamentally  
16 you're looking a different licensing basis for a  
17 risk-informed plant versus a deterministic plant  
18 because you determined based on risk insights that you  
19 may need some additional systems or modifications that  
20 you didn't have in the deterministic plant.

21 You may also determine that there are some  
22 particular design features in the risk-informed plant  
23 that aren't as necessary because they're not safety  
24 significant.

25 MEMBER SKILLMAN: Okay, let me ask this.

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1 To what extent would Option Three require a rewrite of  
2 the FSAR or rewrite of the Tech Specs?

3 MR. GIITTER: Well, we definitely require  
4 a rewrite of the FSAR.

5 MEMBER SKILLMAN: Okay.

6 MR. GIITTER: The Tech Specs at a lot of  
7 plants are going to be changed anyway because of  
8 risk-informed Tech Specs.

9 MEMBER SKILLMAN: Okay, so let's talk  
10 about rewrite of the FSAR. Isn't that a swamp that is  
11 just -- that is just endless opportunity for error?

12 MR. GIITTER: Well, FSARs are rewritten  
13 all the time based on --

14 MEMBER SKILLMAN: In piecemeal based on  
15 amendments that are --

16 CHAIRMAN STETKAR: But isn't that a swamp  
17 that the piecemeal cannot be tracked correctly so that  
18 you get inconsistencies in your FSAR?

19 MEMBER SKILLMAN: If your configuration  
20 control program is poor, yes. Exactly.

21 CHAIRMAN STETKAR: Okay but that's --  
22 that's the current situation.

23 MEMBER BLEY: I mean I agree with a lot of  
24 your points Dick. But I also note as you did with your  
25 ETAP plant, this isn't a problem with Option Three or

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1 with the PRA, it's a problem that applies to essentially  
2 everything in the plant. All the analysis, all the  
3 equipment. And if you don't have a good program, it  
4 isn't going to be what you thought it was.

5 MEMBER SKILLMAN: I agree.

6 CHAIRMAN STETKAR: If you have a good  
7 program, you have a good program. If you don't have  
8 a good program, --

9 MEMBER SKILLMAN: That isn't Option  
10 Three's fault, that's the plant's fault. And nobody's  
11 going to fix that.

12 CHAIRMAN STETKAR: Will Option Three fix  
13 it?

14 MEMBER SKILLMAN: Option Three would at  
15 least require you to take a comprehensive look at your  
16 plant and the licensing basis for your plant. Which  
17 currently isn't required. It's done piecemeal.

18 So in some sense it would at least provide  
19 that catalyst in my mind that would prompt perhaps you  
20 know, comprehensive reexamination of your licensing  
21 basis. And given the fact that it's at one time, you  
22 know, you wouldn't have this necessarily piecemeal  
23 changes over the course of you know, several years.

24 So it could actually provide a catalyst to  
25 take some of the -- if you want to characterize them

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1 as marginal performers in terms of comprehensive look  
2 at their facilities and give them a shock in a sense  
3 to look at things.

4 MEMBER SCHULTZ: It's hard to believe that  
5 would not happen given at least this description.

6 MEMBER RYAN: It would seem to me that  
7 there'd be some kind of a feedback mechanism too if the  
8 staff isn't you know, not just doing this in a vacuum.  
9 There's going to be some feedback, the reactor would  
10 feedback, they adjust. And that's a cycle that goes  
11 on you know, really robust program that's healthy.

12 So I'm just trying to -- so how do you  
13 describe a healthy program? And if a program is  
14 healthy by whatever measure or structure you send up  
15 to make that -- or set up to make that evaluation, you  
16 know, you can demonstrate what you're trying to  
17 demonstrate.

18 I mean, I take your point that if it's not  
19 exercised properly it's probably not worth much. That  
20 it could be worth less. So I think it's -- it really  
21 gets down to how do you judge the program? How do you  
22 decide it's a good program or needs its work? I don't  
23 know.

24 Does that make sense Dick?

25 MEMBER SKILLMAN: Yes.

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1 MR. DUDLEY: Yes. Are there any more  
2 questions on Power Reactor Option Three?

3 MEMBER BROWN: Your next is just a path  
4 forward, right?

5 MR. DUDLEY: Yes. Right.

6 MEMBER BROWN: Can I go back to Option Two?

7 MR. DUDLEY: Sure.

8 MEMBER BROWN: The -- I guess the page ten,  
9 slide ten is the one of interest. The self-approved  
10 certain plant changes list conformed to add to the  
11 license requirements without prior NRC approval of the  
12 CDF -- Delta CDF is no more than -- is less than one  
13 times ten to the minus seven.

14 Which always gives me a little bit of pause  
15 for thought. Because somebody's got to model ten to  
16 the minus seven to get there. And I guess I was trying  
17 to come up with an example that I could phrase my  
18 question to make it clear.

19 Right now in my world, the I&C world, we're  
20 dealing with the issue of how you transmit data out of  
21 a plant and whether it's a unidirectional hardware  
22 based or whether it's a firewall which has software  
23 involved in it.

24 The initial efforts in some of the early  
25 designs when we first looked and we were first talking

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1 about these five years ago, six years ago, the comment  
2 was that oh, well because we've got a firewall there  
3 and we've got anti-virus software, we've got malware  
4 detection, Trojan horse, and everybody thinks this  
5 stuff is the hot -- theirs is the hottest stuff that  
6 ever walked the face of the earth.

7 So, we've been trying -- there's been a  
8 forcing function to try to get people to more consider  
9 you know, strictly hardware based transmissions. So  
10 there is no external capability to get in.

11 And I'm looking downstream, you get a plant  
12 configured like that and now you come along later, five  
13 years later and management or somebody in the plant  
14 decides gee, we're spending a lot of effort because we  
15 have to have people come into the plant, bring hardware  
16 down, go down to the cabinets. You know open them up,  
17 put you know, a lap top in connection with it.

18 It would be far more efficient to be able  
19 to send this from the vendor directly via the internet  
20 into the plant, into the server, the network system and  
21 then down to the maintenance cabinet. And then into  
22 cabinets you know, to change whatever you want to  
23 change.

24 So that would require a firewall to  
25 software as opposed to a hardware based one way. And

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1 I can easily envision the computer weenies that think  
2 their virus software and protection software is so  
3 perfect that they will easily meet the one times -- it  
4 will be easily be one times ten to the minus 12, the  
5 way they'll advertise this.

6 They'll change that fire -- that barrier  
7 to a software based barrier and nobody will ever see  
8 it. And I don't know how as a regulator there are  
9 certain boundary conditions I would have a hard spot  
10 with allowing free you know, self approval. On the  
11 program I came from nobody changed it without  
12 headquarters while were the designers as well as the  
13 regulator. But we had to be careful of that.

14 So, I just you know, that one just -- there  
15 are some things that it would probably work just fine  
16 for. But there are others that are fraught with peril  
17 in my own mind. So I don't know how you balance that.

18 I'm not saying you don't go forward. But  
19 it seems to me there have got to be some look at what  
20 somebody's doing. As it chose to without prior NRC  
21 approval are very strong words. And self approval  
22 means nobody -- effectively nobody looks at it or has  
23 to look at it.

24 MR. GIITTER: I can address that Dick.  
25 Currently what the process laid out here is exactly what

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1 we do for NFPA-805.

2 CHAIRMAN STETKAR: And other things.

3 MR. GIITTER: And other things, thank you.

4 Yes. I agree with your comment on the degree of  
5 precision sometimes when you come up with a  
6 quantitative value for core damage frequency. That  
7 people who practice PRA understand there are  
8 limitations and that you can't you know, when you get  
9 really small numbers like that you have to be careful.

10 But the point is that we have to ensure that  
11 there would be only minimal increases in risk or even  
12 preferably decreases in risk in the modifications that  
13 are being made. So it's -- what you're really looking  
14 at is the relative order of magnitude. You want to make  
15 sure that the risk increase if there is one is actually  
16 very small to allow licensees to self approve.

17 And we do audit that. It's not like we're  
18 not taking a look at it. We do you know, that is  
19 something we will look at. And through the audit  
20 process or through our regular oversight process. But  
21 at some point you know, we have to kind of let go of  
22 things that are of very low risk significance because  
23 --

24 MEMBER BROWN: Well, I don't think that --  
25 what I -- the example I gave is not a low risk

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1 assessment.

2 MR. GIITTER: No, but what we're talking  
3 about is.

4 MEMBER BROWN: Not even close.

5 MR. GIITTER: No and I understand that. I  
6 understand that. But what we're talking about is, is  
7 items that are clearly of low risk significance. Or  
8 preferably if you're even looking at modifications that  
9 improve safety and decrease risk. That wouldn't  
10 require NRC approval unless it changes the licensee  
11 basis of the plant.

12 So, there is precedent here. We're not  
13 just making this stuff up. It's based on the you know,  
14 the regulatory infrastructure we have in place. And  
15 we've implemented it and NFPA-805 in other areas as  
16 well.

17 MEMBER SCHULTZ: So would the example that  
18 Charlie has brought up, would that be caught in the  
19 first bullet where we're talking about maintaining  
20 compliance and insuring that NRC's specific specified  
21 criteria are met? In other words, what Charlie is  
22 saying is there's certain things that you would not want  
23 to fall out of the control process because someone's  
24 come up with a great idea that reduces a particular  
25 system vulnerability they think to a low, low level and

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1       they're wrong.

2               So, he's looking for a backstop that will  
3       catch that and prevent it from happening.

4               MEMBER BROWN:   And I don't think an audit,  
5       I mean, audits or spot checks.   And I am just not sure  
6       that an audit would catch them.   And obviously I have  
7       strong feelings on this particular incident.

8               CHAIRMAN STETKAR:   That's a bit of the  
9       problem is that you have strong feelings about one  
10      particular aspect of the digital I&C design.   A  
11      materials guy has one -- has his own strong feelings  
12      about one particular materials issue.   A pump guy --  
13      everybody has their own strong feelings about  
14      individual issues.

15              And everybody is not equally got.   Now the  
16      nice thing about risk assessment is you look at  
17      everything under the same umbrella.

18              MEMBER BROWN:   Well, and all I'm saying is  
19      I got the risk --

20              CHAIRMAN STETKAR:   And you see that the  
21      risk models may be less, the current risk models may  
22      be less capable of evaluating with six significant  
23      figure in numerical precision, elements of software in  
24      digital I&C programs.   And that's true.

25              On the other hand, they can also evaluate

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1       uncertainties.   And in many cases the differences  
2       don't make any difference.

3               MEMBER BROWN:   I guess I would think that  
4       -- I understand you point.

5               CHAIRMAN STETKAR:   But part of this --

6               MEMBER BROWN:   But I think --

7               CHAIRMAN STETKAR:   Part of this notion  
8       without pointing fingers, is to remove I think in my  
9       opinion, a bit of that issue specific focus among  
10      designers,   you know,   maintainers,   regulators,  
11      everybody and say let's at least use the risk assessment  
12      process to look at all the contributors to risk.

13              MEMBER BROWN:   My only point is and my --  
14      and this again, like you say, I have a very parochial  
15      thought process and very focused on the areas for which  
16      I have -- my greatest interest.   But software is very  
17      amorphous.   It is not predictable.

18              The way people program it varies from  
19      individual to individual.   What one guy thinks is  
20      satisfactory in terms of how he structures his software  
21      is fine.   Another guy has a different way of doing that  
22      because he thinks the other guy is not doing it the right  
23      way.

24              And I think that's a far greater  
25      vulnerability then in some of the more hardware, what

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1 I call the blacksmith tech -- I know, I'm not being  
2 facetious, I mean the blacksmith you know, materials,  
3 et cetera, et cetera. It's a little bit more amenable  
4 to looking at small variations because they're just not  
5 as intractable as the variability of software is.

6 CHAIRMAN STETKAR: You talk to sump pump  
7 designers and they say they'd like to have a factor of  
8 three margin or net positive suction head available  
9 divided by net positive suction head required. Other  
10 people say no, maybe one and a half, maybe you could  
11 get down to one. Maybe a little bit of cavitation is  
12 okay. What's the difference?

13 MEMBER BROWN: That is not the same. I  
14 don't think those --

15 CHAIRMAN STETKAR: That's a -- okay.  
16 Okay.

17 MEMBER BROWN: That's like moral  
18 equivalence. Okay, I don't think they're totally. I  
19 understand your point but they are not equivalent,  
20 okay. You can put your hand on that. You can't on the  
21 software. It's buried in ones and zeros.

22 CHAIRMAN STETKAR: Okay.

23 MEMBER REMPE: Since you went back to this  
24 one --

25 MEMBER BROWN: I'm sorry. Excuse me, go

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1 ahead.

2 MEMBER REMPE: Well there's one point I  
3 thought about mentioning and didn't. But more then  
4 minimal, ten to the minus seven per year is different  
5 for an AP1000 perhaps then an older plant. And so why  
6 did you decide to go with something like that to  
7 quantify more then minimal then saying like ten percent  
8 or five percent or something like that of the frequency?  
9 And have you thought about changing that type of  
10 statement to have a percentage of the core damage  
11 frequency for example?

12 MR. DUDLEY: Well, these are based on what  
13 we do for NFPA-805. And Joe, do you want to apply that  
14 to -- can you expand that to other new plant designs  
15 or any?

16 MR. GIITTER: Well, yes, without getting  
17 into new plant designs, it's a metric that's consistent  
18 with how we measure risk. So, if you look at a  
19 percentage, I mean, you could always do that. But the  
20 way that the standards are written and the regulatory  
21 guidance is written and the standard practice within  
22 the PRA community is to look at core damage frequency  
23 or other as measures.

24 So it's -- I understand your point, why  
25 don't you look at it in relative terms because you have

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1       --

2                   MEMBER REMPE:     You may have a small  
3 modular reactor coming in.

4                   MR. GIITTER:    You may have a small modular  
5 reactor which has a much lower risk profile than an  
6 operating -- currently operating reactor.  You know,  
7 it's something we will -- you know, we can consider.  
8 I understand your point.

9                   MEMBER REMPE:    Okay.  I just thought I'd  
10 mention it.

11                  MR. GIITTER:    Quite frankly I don't think  
12 we've given it any thought.  But --

13                  MEMBER REMPE:    It's just something to  
14 think about.

15                  MR. GIITTER:    Yes.

16                  MEMBER REMPE:    Okay.

17                  MEMBER BROWN:    Also, don't take my  
18 comments that I'm not against some relaxation to allow  
19 people to do stuff on their own.  I mean that's -- we  
20 can over complicate stuff and drive costs out of sight.  
21 So I understand that.

22                  I just, along with Steve's comment about  
23 backstops.  I just think that somewhere at the higher  
24 level, but not down in the lower levels.  I mean, I can  
25 look at stuff going on in the I&C where some changes

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1 they make would be perfectly acceptable without going  
2 through your thing.

3 But if there's certain boundary conditions  
4 I think that ought to be put in place on some things.  
5 I quit.

6 MEMBER REMPE: The Charlie Brown software  
7 rule.

8 MR. DUDLEY: I had one more slide. And  
9 maybe I can just do that before the break. Again, this  
10 last slide is on our path forward.

11 We had written a draft white paper that we  
12 had hoped we could have made public prior to this  
13 meeting. And we were unable to do so.

14 CHAIRMAN STETKAR: We were pretty hopeful  
15 that would have occurred too. I'll just put that on  
16 the record.

17 MR. DUDLEY: Right.

18 CHAIRMAN STETKAR: And we're pretty  
19 disappointed that we didn't get to see that.

20 MR. DUDLEY: Right. Right. That paper  
21 is now under review by NRC Senior Management. We will  
22 incorporate management comments into an updated draft  
23 of that white paper as soon as we can. And we will  
24 publically release it and the Committee will get it at  
25 that time.

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1           We'll have a public meeting to discuss the  
2       white paper probably in April, maybe late April to  
3       discuss the white paper. At one point -- at some point  
4       along the process we'll solicit written comments on a  
5       version of the white paper. It probably won't be the  
6       first version. We'll probably want to iterate on it  
7       a little -- a time or two so that we have a little more  
8       fully developed paper when we go out for public comment.

9           So, I can't tell you exactly when we'll ask  
10      for public comments. The paper will be available as  
11      it evolves over time on the Regulations.gov, the  
12      Federal rule making website. And at some point we will  
13      ask for written public comments.

14           We will then receive those comments,  
15      summarize those comments and I think that that's  
16      probably the best time for us to come back and meet with  
17      you. But we're certainly open to discussions as to how  
18      you would like the interactions to take place. But we  
19      think that can happen sometime this summer.

20           And the due date for the SECY paper we're  
21      tasked with providing is December 18, 2015. This date  
22      was established before this op -- of this effort evolved  
23      to include an Agency wide policy statement. So I am  
24      not a hundred percent certain --

25           CHAIRMAN STETKAR: Wait, until you return

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1 to the original tasking memo, which required an Agency  
2 wide policy statement?

3 MR. DUDLEY: Well the SRM 1 recommendation  
4 would change the scope also and there were some -- there  
5 were some redirections associated with that. But  
6 you're right. I -- December 18 is the current date.  
7 I will strive to try to meet that date. Depending upon  
8 how much detail we get into on an Agency wide policy  
9 statement and how long it takes to reach Management  
10 agreement on that, will determine whether or not I think  
11 we can meet that date.

12 And that completes my presentation on the  
13 status of our activities on the risk management  
14 regulatory framework.

15 MEMBER BLEY: We'd sure like to see the  
16 white paper as soon as we can.

17 MR. DUDLEY: Yes. We understand that and  
18 we're providing it as soon as possible.

19 MEMBER BLEY: Do you have a date set for  
20 the public meeting?

21 MR. DUDLEY: No.

22 MEMBER BLEY: How far before the public  
23 meeting do you have to have the paper?

24 MR. DUDLEY: We generally -- well, I think  
25 we're going to have like a 60-day public comment period.

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1 So we usually like to have the public meeting right in  
2 the middle of the public comment period.

3 MEMBER BLEY: Okay.

4 MR. DUDLEY: So that people have had time  
5 to read the paper. And then they can come to the  
6 meeting and we can have our discussions and then they  
7 can produce -- then they still have time to produce  
8 informed comments.

9 So the public meeting should be right about  
10 in the middle of the public comment period, about 30  
11 days after we've released the --

12 CHAIRMAN STETKAR: So you're looking  
13 roughly a month from now at the latest if this late --  
14 late April date for the public meeting is --

15 MR. DUDLEY: That is correct. Yes, I'm  
16 one of the Senior Managers and I've asked Senior  
17 Managers to provide their comments to me on this current  
18 draft by next Tuesday. I'm not sure how many  
19 iterations we'll go through.

20 That would depend some -- once I see the  
21 first round of comments I'll have an idea of whether  
22 we're converging or whether we're still -- have  
23 differing views that we need to work out.

24 CHAIRMAN STETKAR: Anything else for --

25 MEMBER SCHULTZ: Just to clarify Dick, I'm

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1 confused by these different versions that you intend  
2 to create. Isn't one version going out for public  
3 comment? Or are you going to iterate on the version  
4 sometime during the public comment period?

5 MR. DUDLEY: As soon as we get a white  
6 paper that is approved by Management, we'll release it  
7 to the public, post it on Regulations.gov.

8 MEMBER SCHULTZ: Got you.

9 MR. DUDLEY: Over time, as we work with  
10 that, we'll update that white paper so that the  
11 publically available version will evolve. And when we  
12 get to the point we think it's appropriate that we've  
13 got enough detail in that particular version of the  
14 white paper, then we will solicit formally written  
15 public comments.

16 So the public can follow this entire  
17 process on Regulations.gov by looking at -- each white  
18 paper will be there. And as it evolves from time to  
19 time, members of the public will be able to see that.  
20 After --

21 MEMBER SCHULTZ: But they're not  
22 providing comment?

23 MR. DUDLEY: Only at one point when we  
24 think there's -- we have the proper amount of detail  
25 in that paper, then we would solicit written public

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1        comments. But only one time. But the paper is out  
2        there available hopefully, you know, in two or three  
3        weeks. And as it evolves over time, we will continue  
4        to make the updated versions available on  
5        Regulations.gov.

6                MEMBER SCHULTZ: and then there'll be a  
7        public comment period of some duration of --

8                MR. DUDLEY: And we will meet after 60  
9        days.

10               MEMBER SCHULTZ: And then we'll meet again  
11        after the public comments have been provided but not  
12        resolved, most likely.

13               MR. DUDLEY: Right. We'll summarize for  
14        you the public comment.

15               CHAIRMAN STETKAR: Well, I think the  
16        Subcommittee probably would want to meet before that.  
17        When you say we, the full ACRS certainly -- well, I can't  
18        speak for the full ACRS. But the Subcommittee would  
19        want to engage, you know, earlier rather than later.

20               MR. DUDLEY: That sounds good.

21               CHAIRMAN STETKAR: The full ACRS you know,  
22        that's up to the Committee.

23               MR. DUDLEY: Yes, this next meeting will  
24        be a Subcommittee meeting.

25               CHAIRMAN STETKAR: Anything else for

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1 Dick?

2 (No response)

3 CHAIRMAN STETKAR: Well, what I've done  
4 is, I know we have some staff members out on -- we have  
5 two bridge lines set up for this particular meeting.  
6 And I know we have some staff members on one of them.  
7 And I've asked that that line be opened up. We'll open  
8 up the meeting for public comments closer to the end  
9 of the meeting.

10 But because we're finishing this general  
11 discussion on the RMRF and the different Options, I'll  
12 just ask if anybody from the staff is out there, if you  
13 want to add anything to the discussion, you've been on  
14 mute. So this is your opportunity.

15 MR. HARRISON: This is Donnie Harrison.

16 CHAIRMAN STETKAR: Hi Donnie.

17 MR. HARRISON: Hi. As we were going  
18 through the slides and the discussion on like backstop,  
19 it dawned on me that we need to recognize in both Options  
20 Two and Three, at some point the staff's going to have  
21 to deal with or struggle with the ideas of  
22 defense-in-depth, safety margins and that type of  
23 thing.

24 Since we're not risk-based, we're  
25 risk-informed. So, the discussions on the slides are

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1 all geared towards risks and there's other factors we  
2 need to include.

3 CHAIRMAN STETKAR: That's a good point.  
4 I mean you know, 1174 addresses those issues. But  
5 perhaps not as quantitatively as you might want.

6 MR. DUDLEY: And the paper on Near Term  
7 Task Force Recommendation One had some substantial  
8 recommendations for improving our definition and  
9 criteria for adequacy of defense-in-depth. So we  
10 would likely include that sort of an effort into one  
11 of these options if we were to you know, if we were to  
12 recommend it. Although so that it would be a  
13 risk-informed and not risk-based approach.

14 CHAIRMAN STETKAR: Well, Donnie's right.  
15 I mean, it applies both to Options Two and Three as  
16 they're --

17 MR. DUDLEY: That's correct.

18 CHAIRMAN STETKAR: As they're cast now.

19 MR. DUDLEY: But we have to have better  
20 handle on defense-in-depth, safety margins and other  
21 related facets.

22 MR. HARRISON: Right. I didn't want to  
23 leave the impression that just because someone could  
24 say a large LOCA with one train of safety systems is  
25 always going to be a low ten to the minus seven,

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1           therefore I can get rid of the second train.

2                   MR. DUDLEY:   Right.

3                   MR. HARRISON:   We would have a -- we'd have  
4           to add defense-in-depth metrics as well to say what's  
5           the minimum interpretation of defense-in-depth so  
6           those things wouldn't happen.

7                   MR. DUDLEY:   Right.   Right.

8                   CHAIRMAN STETKAR:   Good.   Anybody else  
9           from the staff out there?

10                   (No response)

11                   CHAIRMAN STETKAR:   If not, we'll cut you  
12           off again and put you on mute.   And we'll take a recess  
13           until 10:15.

14                   (Whereupon, the above-entitled matter  
15           went off the record at 10:01 a.m. and  
16           resumed at 10:16 a.m.)

17                   CHAIRMAN STETKAR:   We are back in session.  
18           I guess you're up Joe.

19                   MR. RIVERS:   Okay, we basically thought  
20           that it would be a good opportunity to give you folks  
21           on the ACRS some insights into some of our activities  
22           on trying to risk-inform security.   This dates back to  
23           probably about 2009 where we started actively working  
24           in this area when former Chairman Klein and that time  
25           Commissioner Klein gave a talk at a November 2009 ANS

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1 meeting and one of his statements he made in that  
2 presentation was that NSIR needs to better risk-inform  
3 security.

4 And so the next day I was called into Jim  
5 Wiggins' office and Jim said Joe, you have a new area  
6 of responsibility. Get to work.

7 And so that sort of -- and we have been  
8 doing things related to this before, but not formally  
9 talking about it as risk-informed in security. So we  
10 can go to the next slide.

11 But one of the first things we did is we  
12 worked with the Office of Research to put together a  
13 workshop. We had Sandia actually conduct the workshop  
14 for us. It was actually held at a classified level.  
15 That was held at Sandia in the fall of 2010.

16 And essentially what came out of that  
17 workshop was six sort of areas of opportunities were  
18 identified to potentially risk-informed security.  
19 One was the uncertainty of initiating events. Always  
20 the -- one of the bigger challenges in security.

21 Simulation tools, collaboration between  
22 safety and security, cyber security, improving metrics  
23 and also the possibility of a demonstration project  
24 like WASH 1400. So, once that workshop was complete,  
25 that was about the time that the Risk Task Force that

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1 was headed up by Commissioner Apostolakis began.

2 And so we decided to lay low a little bit  
3 there to see what came of that Task Force before we  
4 proceeded in any of these initiatives. Next slide  
5 please.

6 One of the things we found from the  
7 workshop that Sandia hosted was that it cost us a lot  
8 of money. So I came up with the brilliant idea that  
9 we ought to get a professional society to host one of  
10 these. And essentially it would cost us travel costs  
11 and registration fees.

12 And so we asked them to host a workshop  
13 on risk-informing security. It was initially  
14 scheduled for October 2013. The Government shutdown  
15 sort of impacted us there. We rescheduled it for  
16 February 2014. And these were the five general areas  
17 that we worked on that workshop. Next slide please.

18 MEMBER SKILLMAN: Joe, what is INMM?

19 MR. RIVERS: It's the Institute of Nuclear  
20 Materials Management.

21 MEMBER SKILLMAN: Thank you.

22 MR. RIVERS: So it's that along with the  
23 American Nuclear Society are probably the two that  
24 cover most of the activities, but that this Agency's  
25 involved at.

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1           So, the area of safety and security risk  
2           assessment is we had discussion at PRA and NRC. We had  
3           some other presentations, one by Los Alamos on an  
4           extensible risk-informed decisions work method.  
5           Another lab person presented on implications of  
6           security challenges for safety assessment tools.

7           And then DNDO presented on some of its risk  
8           models that it actually develops under Executive Order  
9           requirements. Next slide please.

10          Then I convened a panel on material  
11          attractiveness, an effort that we've got to try to  
12          understand what special nuclear material was -- how  
13          attractive it is to potential adversaries. We made a  
14          presentation on the NRC approach that was under  
15          development.

16          DOE provided some technical support for  
17          that NRC approach. We had Matt Bunn provided some  
18          thoughts on where he thought that approach ought to go.  
19          Industry gave some insights that they had.

20          The United Kingdom gave comments on their  
21          concepts for dilution, which is the primary focus of  
22          our approach. And the French provided a presentation  
23          on security in civilian facilities.

24          One thing to make note of is that at the  
25          2012 Nuclear Security Summit, the U.S., France and the

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1 United Kingdom gave -- made the commitment to have a  
2 workshop on material attractiveness and this workshop  
3 and this specific panel actually met that commitment  
4 that was made at that Nuclear Security Summit. Next  
5 slide please.

6 The likelihood of event --

7 MEMBER BLEY: Before you do that.

8 MR. RIVERS: Yes?

9 MEMBER BLEY: There's a conference coming  
10 up in March, is that -- that's associated with --

11 MR. RIVERS: I'm going to talk about it.

12 MEMBER BLEY: Oh, you've got that coming  
13 up. I didn't see it when I -- I didn't flip far enough.  
14 Okay, I'll wait.

15 MR. RIVERS: Okay. Very good. We've got  
16 several conferences coming up.

17 MEMBER BLEY: Okay.

18 MR. RIVERS: So, after we've done that, of  
19 course the real challenge we have here is that unlike  
20 in the safety world where we tend to think that things  
21 will happen randomly and security it's actually a --  
22 when the aberrant started to think -- thinks it's a good  
23 opportunity to do it and he has the best chance of  
24 success. And so, that tends to be somewhat of a  
25 challenge.

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1           So we had presentations on possible  
2 approaches and options. Just how some of those  
3 approaches might be used. And then DoD funds an effort  
4 out of the University of Maryland on -- at the National  
5 Consortium for the Study of Terrorism and Responses to  
6 Terrorism Approach that has some insights on how they  
7 might consider doing that type of a thing.

8           So there's no clear cut way of doing it.  
9 There will be a lot of uncertainty if you try to do that.  
10 And that's generally one of the reasons in the security  
11 world we either do things based on a conditional risk  
12 or focus on trying to look at the consequences that  
13 might be associated with an event. Next slide.

14           CHAIRMAN STETKAR: Joe, is some of that  
15 thought changing though?

16           MR. RIVERS: I don't think it's changing  
17 that much. We're trying to introduce as many risk  
18 insights as we can. But for example when DHS is doing  
19 its integrated terrorism risk assessment models,  
20 especially the Rad Nuc Terrorism Risk Assessment, they  
21 go to the intel community and say what is the likelihood  
22 that there is going to be an initiating event?

23           And when they do that, what they find --  
24 you find is that you get a number. But really, what  
25 is the -- I mean the uncertainty around that number,

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1 and it's probably plus or minus 100 or 200 percent.

2 CHAIRMAN STETKAR: Sure. But I mean, you  
3 know, in the safety arena we deal with that also. And  
4 in some senses, although the uncertainties may be very,  
5 very large, you still may be able to rank order threats  
6 if you will relative to one another.

7 MR. RIVERS: Yes. We -- you know, we used  
8 the -- you know, NRC has the Intelligence Liaison and  
9 Threat Assessment Branch and their job is to try to  
10 understand, you know, we look at the terrorist  
11 activities worldwide. And then we try to assess what  
12 is the likelihood that they're going to show up on our  
13 doorstep.

14 And so we do some of that and then we inform  
15 the Commission. And the Commission makes some  
16 determination as to whether or not we need to adjust  
17 the design basis threat or not based on that.

18 So there are things that are happening in  
19 other parts of the world that we don't assess will  
20 happen here in the United States.

21 MEMBER BLEY: I kind of like what you're  
22 doing there. Because I -- this guy's done a lot of  
23 PRAs. I disagree with many of my colleagues on this  
24 part. You can get some kind of comparative stuff that  
25 would be useful by doing the whole thing at once. But

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1 this is unusual from most of our other kinds of analysis  
2 in that that initiating that first strike, is a time  
3 varying thing.

4 And trying to keep -- I mean, taking  
5 advantage of the government agencies that are tracking  
6 that and trying to be up to date on that makes a lot  
7 of sense to me.

8 MR. RIVERS: And we have a lot of  
9 activities that we work and the interagency with the  
10 White House that if certain things become evident in  
11 the chatter and things like that and the intelligence  
12 understanding of things that we have approaches that  
13 we can use to immediately implement certain  
14 requirements that we wouldn't normally consider as  
15 being appropriate. So, we do work within the  
16 interagency to try to be able to effect those types of  
17 changes if something pops up.

18 CHAIRMAN STETKAR: My only -- the only  
19 reason for my bringing up the topic is that a focus only  
20 on consequences and protection against what are deemed  
21 to be severe consequences can sometimes overlook I'll  
22 call them scenarios that might have not as severe a  
23 consequence as your worst possible focus, might have  
24 a higher frequency. You know, opportunistic attacks  
25 --

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1 MR. RIVERS: Well, and I think that --

2 CHAIRMAN STETKAR: And that's the notion  
3 of trying to understand you know, the more integrated  
4 some of that.

5 MR. RIVERS: I think we debated some about  
6 of that at the Y12 incident --

7 CHAIRMAN STETKAR: Yes.

8 MR. RIVERS: Where it was the protesters.  
9 You know, when I think back to the '80s, long before  
10 9/11, before Oklahoma City, you know, I can recall that  
11 the security -- DOE Security Manager Rafi Flasch used  
12 to have all the Saint's Days, she had her little  
13 church's calendar up on her door and she highlighted  
14 the ones she thought the nuns would be showing up for.

15 And so that was fairly common back in those  
16 days. And we really focused a lot back in the '80s on  
17 these protests that would take place. At the Nevada  
18 test site we had a you know, certain procedure that we  
19 worked with the protesters that they would cross a line,  
20 they'd get arrested. The next group would cross a  
21 line, they'd get arrested.

22 But I think 9/11 and Oklahoma City and  
23 other events caused us to put more of a focus on the  
24 big major terrorist events. But I think the Oak Ridge  
25 event, the Y12 event, caused us to relook that. And

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1 I know that we as a government are working closely with  
2 the British and the French to try to understand what  
3 is the best way to actually prepare for those types of  
4 civil disobedience type things and how do we address  
5 those in an appropriate fashion.

6 So that's an ongoing challenge right now.  
7 Okay, one of the things I know coming from the DOE world,  
8 you know, DOE world is very heavily and actively  
9 involved in using VA simulation tools. A lot of those  
10 tools actually were developed by the same people that  
11 developed the PRA tools that we use in the safety world.

12 What I also realized is that my likelihood  
13 of getting a regulatory requirement to force them to  
14 use these tools was probably slim to none. And so what  
15 I did is I worked with the vendor communities who  
16 encouraged them to approach the reactor utilities to  
17 talk about how their tools might actually be useful.

18 Both ARES Corporation with AVERT and Rhino  
19 Corporation with Simajin actually have done that. And  
20 so that -- I'll talk about that in a few minutes. But  
21 at this workshop we had both of them make presentations.  
22 Also Sandia and DTRA on some of their modeling aspects.  
23 And then also Pacific Northwest National Laboratories  
24 developing a tool that sort of merges cyber and physical  
25 type security within the tool. So it's a fairly

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1 interesting development there. Next slide please.

2 Cyber security of course is a new and  
3 ever-changing environment. We had some discussion on  
4 the pros and cons and challenges of risk-informing  
5 cyber security. NRC talked about our regulatory  
6 program. And PNNL talked a bit about their cyber  
7 model. Next slide please.

8 Okay, basically post that workshop, what  
9 we've done is we've you know, I wanted to highlight some  
10 of the things that we're working on. Risk  
11 prioritization initiative and of course I won't mention  
12 that, talk about too much now as we're talking about  
13 it this afternoon.

14 CHAIRMAN STETKAR: Joe, I have to  
15 interrupt you in deference to Charlie who's not here.  
16 If I go back to the cyber security, the previous slide,  
17 and you don't have to go back to it. Is that -- that's  
18 an ongoing --

19 MR. RIVERS: Essentially the --

20 CHAIRMAN STETKAR: You said PNNL and those  
21 --

22 MR. RIVERS: Well, Jim and I talked about  
23 cyber risk model, but if we're looking at the regulatory  
24 program, of course we put requirements into place.  
25 It's big -- it's not fully implemented now.

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1 CHAIRMAN STETKAR: But if I stay away from  
2 the regulatory part of it and just put my sort of  
3 engineer hat on, you said PNNL talked about a cyber risk  
4 model or they actively --

5 MR. RIVERS: They're actively pursuing  
6 this.

7 CHAIRMAN STETKAR: They are?

8 MR. RIVERS: Yes.

9 CHAIRMAN STETKAR: Okay. Thanks.  
10 That's what I wanted to -- oh, thank you.

11 MR. RIVERS: So, I'll talk about each of  
12 these individually. But this is sort of what's going  
13 on right now and what I'm working on in risk-informing  
14 security. So you can go to the next slide.

15 Risk prioritization initiative of course  
16 we'll talk a bit more about it this afternoon. But one  
17 of the things that we find is that they do a really  
18 reasonable job on looking at the safety aspects of risk  
19 prioritization.

20 But trying to get the industry to better  
21 understand how to actually look at the security risk  
22 is somewhat of a challenge. And then trying to -- how  
23 to integrate that with the safety risk is also not the  
24 easiest thing. But it's something that we've  
25 committed to work with industry on. Next slide please.

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1                   MEMBER SKILLMAN: Joe, before you change.  
2                   Would you comment on attempting to prioritize emergency  
3                   preparedness?

4                   MR. RIVERS: Well, that also -- basically  
5                   if we look at the industry initiative, they are looking  
6                   at safety, security, emergency preparedness and  
7                   radiation protection, all of those. What you tend to  
8                   find is that the emergency preparedness and radiation  
9                   protection tend to be not as risk significant generally  
10                  as the security and the safety elements.

11                  Emergency preparedness of course is trying  
12                  to mitigate if something does happen. So you've  
13                  already had an event. So, what --

14                  CHAIRMAN STETKAR: We'll hear it -- we'll  
15                  hear a bit more about this this afternoon.

16                  MEMBER SCHULTZ: But your point is that  
17                  security and emergency preparedness, they are  
18                  different --

19                  MR. RIVERS: Yes, they are different.

20                  MEMBER SCHULTZ: In terms of  
21                  characterization with regard to risk prioritization --

22                  MR. RIVERS: Right.

23                  MEMBER SCHULTZ: And with regard to the  
24                  way in which one can benefit from application of  
25                  risk-informed preparation.

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1                   MR. RIVERS:     Right.     Generally the  
2                   emergency preparedness is how do we mitigate if  
3                   something actually does happen.   Security, what you  
4                   find is that you can have security events that can cause  
5                   the same types of things that safety events might cause.

6                   And so --

7                   MEMBER SCHULTZ:   Correct.

8                   MR. RIVERS:   Trying to figure out how to  
9                   actually integrate the safety and security things, it's  
10                  somewhat of a challenge because one of the things I  
11                  think we found was that the people that were generating  
12                  the -- initially generating the industry sort of model  
13                  for risk prioritization didn't actively involve a lot  
14                  of their security people.   So they didn't have the  
15                  understanding of how security actually fit into the  
16                  process.

17                  But you can ask more about that this  
18                  afternoon when it's probably a better venue to do that.  
19                  Next slide, okay.

20                  Risk Management Regulatory Framework  
21                  Working Group, that's what we're here right now for.  
22                  We've been actively involved with that to make sure that  
23                  the security aspects of things are appropriately  
24                  addressed within the working group.   Next slide  
25                  please.

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1           Okay, they used the simulation modeling.  
2           Essentially through some of my efforts we have at least  
3           two of the vendors, ARES Corporation and Rhino Corp that  
4           are actively working with industry right now to look  
5           at how simulation modeling can actually help in them  
6           securing their facilities and also addressing  
7           regulatory issues. ARES Corporation is actually  
8           modeled two or three of the nuclear sites to date.

9           And we're trying to work with industry to  
10          better understand what is -- what do we need to have  
11          here at NRC in the way of oversight of that to allow  
12          that to fit into the regulatory program? So, you know,  
13          I think one of the concerns, we have to understand how  
14          the facilities were modeled, how the data was generated  
15          to do that.

16          And I heard earlier this morning about the  
17          concern about gaming the PRA type models. The same  
18          thing can be done on the security models. And so, we  
19          want to make sure that we have an understanding of you  
20          know, what's common and data elements drive the models  
21          so that we can focus our attention on those elements  
22          in our oversight process.

23                 MEMBER BROWN: If this -- excuse me. Is  
24          this the physical plant? This modeling?

25                 MR. RIVERS: Well, I could talk about the

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1 fact that at least one of the National Laboratories,  
2 Pacific Northwest National Lab is actually trying to  
3 develop a cyber risk model. And also one that  
4 integrates cyber and physical.

5 MEMBER BROWN: Yes, I see you haven't  
6 gotten to that slide yet. I just wanted to see if there  
7 was a separate that this was being applied to.

8 MR. RIVERS: Okay, so next slide please.  
9 Material attractiveness. This is something I actually  
10 worked on when I was at the Department of Energy and  
11 when I came here to NRC I was asked to continue working  
12 in this area.

13 But it's essentially taking what we -- how  
14 we categorize material and security for predominately  
15 the fuel cycle facility, but it will also impact the  
16 research and test reactor facilities. Where you know,  
17 is all uranium and all plutonium the same? And the  
18 answer is no.

19 One example would be that if I have five  
20 kilograms of high enriched uranium metal in a button  
21 versus five kilograms disbursed in soil on a railcar,  
22 do they require the same protection? And the answer  
23 is no. The adversary is going to focus on the metal  
24 button more so than that five kilograms disbursed in  
25 a railcar.

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1                   And so that's what this approach is looking  
2                   at. Next slide please.

3                   To support that we actually conducted a  
4                   study at Los Alamos National Laboratory. They  
5                   developed a logic module that sort of put things into  
6                   four phases. One is acquiring the special nuclear  
7                   material. Looking at a wide variety of facilities and  
8                   types of material that might be present in those  
9                   facilities. What type of processing is required to  
10                  take that material that's acquired at those facilities  
11                  to convert it into a weapons useful form.

12                  Then weaponization goes from a design of  
13                  an improvised device to engineering that improvised  
14                  device. And then one of the questions that I've always  
15                  been asked over the years by the policy makers is, okay,  
16                  that's what Los Alamos and Livermore can do, but what  
17                  can a real adversary do? And so we actually have an  
18                  approach in that model to perform a yield reduction  
19                  based on some understanding that they aren't going to  
20                  be necessarily as skilled as one of our National  
21                  Laboratories.

22                  And then in the end what it does is it  
23                  provides yield -- an estimate of the likelihood of an  
24                  actual nuclear detonation and also a yield associated  
25                  with that detonation.

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1                   MEMBER REMPE: For a minute if you don't  
2 mind going back to slide 13 with the material  
3 attractiveness and your statement. That's assuming  
4 that the adversary is going to do something with the  
5 material for alternative uses when you make that  
6 assumption about which -- whether they'll go for  
7 disbursed materials or not disbursed materials. And  
8 they may have other priorities.

9                   MR. RIVERS: Well from a security  
10 standpoint, when we're looking at this specific  
11 approach, we're predominately focused on the theft of  
12 that material to potentially be used in an improvised  
13 nuclear device. Essentially a mock up of that.

14                  MEMBER REMPE: Right. And so what -- are  
15 you considering other types of adversaries who may just  
16 want to reek havoc? That the disbursed material would  
17 be just as attractive to them.

18                  MR. RIVERS: Well we -- one of the things  
19 we look at and that we're also looking at in this rule  
20 making for material attractiveness standpoint is, of  
21 course with the radioactive materials, we put in  
22 certain requirements in 10 CFR Part 37 to address the  
23 potential use of that material in a disbursement device  
24 and exposure device or other things. And a lot of it's  
25 based on the IAEA Code of Conduct concept of what's

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1 important.

2           Given that some of these special nuclear  
3 materials could also be used in a disbursal device, we  
4 as part of the study that we had conducted at Los Alamos  
5 and also one conducted at Sandia National Laboratories,  
6 we looked at what comparable quantities of special  
7 nuclear material could produce similar effects to those  
8 radioactive materials?

9           And so trying to align the protection  
10 requirements for those smaller quantities of special  
11 nuclear material, generally in the category three  
12 realm, where if we were just protecting them from an  
13 improvised nuclear device threat, we probably wouldn't  
14 put a lot of requirements on because you wouldn't have  
15 enough to do anything. But you might have enough to  
16 actually disburse and cause problems.

17           And so in the rule making that's currently  
18 under development, we would actually add some  
19 requirements to some of those nuclear materials that  
20 could have a radiological fence price. Okay, so the  
21 next slide.

22           So essentially, what we've done is we've  
23 developed this model and based on a lot of information  
24 that we got from this model that Los Alamos developed  
25 for us we identified you know, what are the appropriate

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1 protection mechanisms? It led us to determining that  
2 probably the best property of material to be used in  
3 an attractiveness concept is probably dilution.

4 And so that's essentially how we you know,  
5 developed the material attractiveness approach for the  
6 ongoing rule making. Next slide.

7 MEMBER BALLINGER: But you're limiting  
8 now this to the special nuclear materials?

9 MR. RIVERS: This is special nuclear  
10 material. Cyber security, this panel discussed a  
11 number of things that we talked about. We're looking  
12 at -- some of the things that we're looking at are  
13 reactor cyber security implementation that's underway.  
14 Highest consequence, critical visual assets are  
15 addressed.

16 And we're trying to use a consequence based  
17 approach to consider lesser requirements for critical  
18 visual assets with lower consequences. So, in the  
19 implementation to meet the NRC requirements, there are  
20 eight milestones essentially that all of the plants  
21 have implemented for seven milestones. The last  
22 milestone is focusing on those lower consequence  
23 critical digital assets.

24 And we're in the process of trying to  
25 understand do we need to implement all of the same

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1 requirements on those final visual assets that we did  
2 for all of the previous ones? And I think the general  
3 direction is to try to do it in a more risk-informed  
4 approach where you probably wouldn't expect all the  
5 same security measures to go into place for these lesser  
6 assets then you would in the previous ones.

7 MEMBER BROWN: How do I phrase this? When  
8 you say implementation is underway at the plants, what  
9 are the elements? What kind of elements of that  
10 implementation are there?

11 I mean if -- I mean, we've had absolutely  
12 no, I don't think we have, any discussion of that, of  
13 how you're looking at implementing the you know, the  
14 5.71, Reg Guide 5.71 where it talks about CDAs or  
15 critical digital assets. But nobody's gone through  
16 and okay, when we're looking at this from the top down  
17 and looking at the plant, what are the elements? Where  
18 -- is there a level of work through? You're talking  
19 about reactor cyber security, what does that mean?

20 MR. RIVERS: Well, basically we right now  
21 only our -- have an active requirement at nuclear power  
22 plants. All of the other ones were in a process of  
23 deciding how much cyber security is appropriate for  
24 each of those.

25 MEMBER BROWN: You mean fuel facilities

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1 and things like that?

2 MR. RIVERS: Just for example there is --

3 MEMBER BROWN: I'm looking -- I'm only  
4 asking about reactor -- nuclear power plants right now.

5 MR. RIVERS: Looking at nuclear power  
6 plants, Reg Guide 5.71 is what we tend to be using. It  
7 tends to focus on essentially the NIST process for  
8 addressing cyber security which has several hundred  
9 elements that they're supposed to look at for each of  
10 these digital assets.

11 They put together a cyber security plan.  
12 We evaluate that. We send inspection teams out to  
13 assess whether or not they're implementing the plan  
14 appropriately. This isn't my area of special  
15 expertise.

16 MEMBER BROWN: Okay. So I shouldn't ask.

17 MR. RIVERS: So, I can't give you a lot of  
18 detail on that. But I'm sure that if you'd like to talk  
19 to our cyber security folks, Barry Westreich is the  
20 Director of the directorate. He or his deputy would  
21 be very happy to talk to you.

22 MEMBER BROWN: Okay, so we've got a  
23 meeting coming up if I remember correctly in a month  
24 or so?

25 CHAIRMAN STETKAR: Fuel cycle facilities.

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1                   MR. RIVERS:       It's for fuel cycle  
2 facilities.

3                   CHAIRMAN STETKAR:   It's not nuclear power  
4 plants.

5                   MR. RIVERS:   But I'm sure that because  
6 you'll have the right people there that they can answer  
7 your questions on reactors and such.

8                   MEMBER BROWN:   But we could -- we'll have  
9 to talk more.

10                  CHAIRMAN STETKAR:   Well PNNL apparently  
11 is developing some models for cyber security. At least  
12 Ocone for example ought to have in place. Remember  
13 there aren't too many operating plants in the country  
14 that have the integrated safety and you know,  
15 protection control systems. Ocone is one though. So  
16 if we're interested to find out you know, what they've  
17 actually done in terms of hardware and otherwise.

18                  MEMBER BROWN:   Well, I was interested also  
19 not just -- you know, not just looking at the  
20 plant/plant type stuff. But you know the other  
21 activities that are conducted within you know, what I  
22 call the overall governance and management of the plant  
23 and how is that looked at if you're not --

24                  MR. RIVERS:   Right, but I'm not the expert  
25 on that.

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1                   MEMBER BROWN:       That's fine.       I  
2 understand. I'm not going to go -- we're not going to  
3 do that.

4                   MR. RIVERS:    Sorry.    So --

5                   MEMBER BROWN:   We just -- I think we need  
6 to.

7                   MR. RIVERS:    Well I think you can talk to  
8 our folks that are involved in that because we have to  
9 address all of the things including their business  
10 systems and their access authorization systems. All  
11 of those things get factored into.

12                  MEMBER BROWN:   Yes, my concern is how  
13 those would integrate down into the configuration  
14 control and other plant management to interact. You  
15 know, how they interact because right now they're not  
16 supposed to electronically interact but they --

17                  MR. RIVERS:    That's right.   They're  
18 supposed to be --

19                  MEMBER BROWN:   But we can pursue that  
20 separately.

21                  CHAIRMAN STETKAR:   Yes.   That's a good  
22 idea.

23                  MEMBER BROWN:   All right.   We might even  
24 have to have a separate meeting on that.

25                  CHAIRMAN STETKAR:   Another Subcommittee.

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1                   MEMBER BROWN: But I'm not sure we'll have  
2 enough time if the other one's just a half day.

3                   MR. RIVERS: So anyway, on the fuel cycle  
4 essentially that's gone to the Commission. We've got  
5 I think three of the four votes back on that. So we'll  
6 be waiting an SRM on that.

7                   We're also had -- there's a paper that was  
8 developed on research and test reactors. Then we'll  
9 also be looking at radioactive materials as well. So  
10 we're trying to look at all of those. But the first  
11 initial focus was on power plants because they have the  
12 biggest potential consequence. Next slide please.

13                  I chair an IAEA Coordinated Research  
14 Project in Vienna that's been ongoing for a couple of  
15 years right now on the development of essential  
16 guidance on how to conduct security assessments. So  
17 it fits right into this idea of risk-informing  
18 security.

19                  So the intent is to develop sort of two  
20 levels of guidance. One that is a more complete type  
21 guide that would sort of supporting nuclear power  
22 plants or category one fuel cycle facilities. And a  
23 lesser guide that would be a little bit more  
24 straightforward to be able to be used by a wider variety  
25 of facilities.

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1           A lot of times for example if I get to an  
2           irradiator facility, the person doing the security is  
3           a radiation safety officer. And so he's not going to  
4           have either the interest or the knowledge to  
5           necessarily understand a very complex guide that you  
6           might use in a nuclear power plant.

7           To support this we're also doing case  
8           studies that help people understand how to implement  
9           it within their own type of facility. And the five that  
10          we currently have ongoing are nuclear power plant case  
11          study, an irradiator facility, radioactive material  
12          transport, and LEU fuel fabrication facility and a  
13          spent fuel storage facility.

14          To basically figuring that a general  
15          guidance document generally a lot of times isn't  
16          enough. That you need to have these case studies that  
17          can be used to support those guidance documents and also  
18          potentially support training activities. Next slide.

19          Also, we've got a number of workshops that  
20          will be carried out this year. These are the three  
21          workshops. Next slide please.

22          The INMM and Reducing Risk Workshop is  
23          actually the seventh in a series of reducing risk  
24          workshops that INMM has put on. This one will be put  
25          on at GW University next month, the week after the RIC.

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1 It will have four panel discussions. One of them will  
2 be on cyber security.

3 I've set the cyber security panel  
4 discussion to focus on essentially risk associated with  
5 security -- cyber security at a nuclear power plant.  
6 It will have panel members from NRC Cyber Security  
7 Directorate, three of the National Laboratories and  
8 also industry.

9 There will be three other panels during the  
10 workshop. One will be on insider mitigation. A third  
11 one will be on perception of risk. And a fourth one,  
12 because we're doing this in conjunction with the  
13 Elliott School of International Affairs, will be on  
14 essentially the changing relationship with the  
15 Government of Russia.

16 Given with what's been happening in the  
17 Ukraine and things like that. So it will be a fairly  
18 diverse workshop. Next slide please.

19 MEMBER BLEY: Are you getting mostly the  
20 people you interact with anyway? Or are you getting  
21 some -- a bigger cross section? You've gotten some  
22 good ideas coming out from these?

23 MR. RIVERS: We tend to get a bigger cross  
24 section. We also get a lot of international fly in on  
25 some of these workshops. I know that one of the names

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1 I've seen that's registered is Philippe Galland from  
2 Russia, not from Russia, from France, from CEA.  
3 Usually we get representation from the UK, from Japan,  
4 from other governments that will send people to these  
5 workshops.

6 We also try to open them up so that we get  
7 non-governmental organization participation. For  
8 example, on the perception of risk work panel  
9 discussion, Ed Lyman will be a participant on that.  
10 We'll have a couple of folks from NRC that will  
11 participate. And so that -- I think somebody from  
12 Monterey will also be on that panel.

13 So, we try -- when I do these workshops I  
14 try to do it in such a way that we get a very wide and  
15 diverse group up in the panel so that we get a lot of  
16 participation from the workshop participants as well.

17 One of the things to come out of both the  
18 Sandia and the Stone Mountain workshop were that we  
19 needed to really engage the risk, safety and security  
20 people. So working with Nathan Su and John Nakoski in  
21 research, we identified that an ANS meeting that was  
22 being given at Sun Valley, Idaho in April as being a  
23 targeted opportunity that will have a lot of the safety  
24 risk analysts at that meeting.

25 And so, we are working with ANS to put on

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1 a one day workshop on the day prior to the ANS meeting  
2 to have a day of engagement between the safety and  
3 security risk professionals. Next slide please.

4 One of the things that has never really  
5 taken place is actually a real workshop on  
6 vulnerability assessment tools. And since I think  
7 when I mentioned it to Chris Lui and my boss that we  
8 had set up the ANS INMM one on safety and security, she  
9 walked in the next day and said well, when are you going  
10 to do one on vulnerability assessment tools.

11 So, we got the INMM to agree to put on this.  
12 It will be a three-day workshop in Boston in September.  
13 We'll have a discussion of VA tools that will talk about  
14 the validation, verification and accreditation of  
15 tools, of software tools. It will have a discussion  
16 of modeling issues. A discussion of data.

17 We'll have a demonstration by vendors.  
18 And this is one where I'm actually pulling in the NUSAM  
19 project I mentioned before where there's a case study  
20 on nuclear power plants where we'll actually give the  
21 vendors that are participating the case study on  
22 nuclear power plants. So each of them can demonstrate  
23 how their tool assesses the security effectiveness at  
24 that nuclear power plant.

25 We'll also give a half day for the vendors

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1 to actually interact directly with all of the workshop  
2 participants. Then we'll have some panel discussions  
3 at the end where we'll have users, regulators, industry  
4 and vendors discuss these vulnerability assessment  
5 tools.

6 MEMBER BLEY: Is DOE coming? Are they  
7 part of this?

8 MR. RIVERS: DOE is actively working,  
9 supporting me in setting this workshop up.

10 CHAIRMAN STETKAR: I haven't heard of this  
11 one Joe, what are the dates in September? Do you have  
12 them? That's all right, we can get them.

13 MR. RIVERS: It's mid-September time  
14 frame. If you go to the INMM website, [www.INMM.org](http://www.INMM.org),  
15 it has a -- in the upcoming events, you can click on  
16 this and get the dates for it.

17 CHAIRMAN STETKAR: Okay. Thank you.

18 MR. RIVERS: And probably in the next week  
19 or so, we'll probably put up the draft agenda for the  
20 workshop on the website as well.

21 Okay. And I think that's the last slide  
22 other than the questions slide. If you have any  
23 questions, I would be happy to answer them.

24 CHAIRMAN STETKAR: Anything more for Joe?

25 MR. RIVERS: But basically we're not

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1 sitting idle and you know, we have our initiatives  
2 ongoing in the security world to try to better  
3 risk-inform security.

4 CHAIRMAN STETKAR: Thank you.

5 MEMBER BROWN: Just one question. You  
6 said this earlier and I just probably missed it. The  
7 risk-informing security, there's some aspects of that  
8 are a little tenuous. I mean how?

9 MR. RIVERS: Well I think it's you know,  
10 my training is you know, as a statistician. So you  
11 know, risk has certain consequences, expected loss  
12 basically is what risk is.

13 But knowing that we can't necessarily do  
14 all of that real well in the security world, it's trying  
15 to look at those elements of risk that can help us do  
16 a better job in security. You know, and I gave some  
17 examples of some of the ongoing activities.

18 You know, some of them include trying to  
19 get more use of simulation modeling at nuclear power  
20 plants. Trying to better understand what can an  
21 adversary really do. Trying to understand what  
22 consequences can actually be achieved because that's  
23 very important to understand. So, all of those types  
24 of things.

25 MEMBER BROWN: Is access -- I mean, access

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1 points are a big part of maintaining a secure  
2 environment.

3 MR. RIVERS: Correct.

4 MEMBER BROWN: And I mean is -- at least  
5 that's a high level.

6 MR. RIVERS: Yes.

7 MEMBER BROWN: Is a way to look at it. I  
8 mean, is that part of the modeling in terms of trying  
9 to look -- I mean, if you're a plant, how many access  
10 points do you have?

11 MR. RIVERS: Well, when you look at -- one  
12 of the issues that you have at a nuclear power plant  
13 or a category one facility is, is you do control access.  
14 Adversaries can use a number of approaches to getting  
15 into the facility. Some of it can be through deception  
16 where they actually fake credentials, steal  
17 credentials or whatever to try to get in to get in  
18 through certain levels. But you may also just use  
19 brute force where you just basically crash through the  
20 fences and use explosives to breach walls and things  
21 like that.

22 So, all of those have to be considered when  
23 you're looking at security risks.

24 MEMBER BROWN: Okay. Thank you.

25 MR. RIVERS: Yes, and one of the things if

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1       you look at the material attractiveness thing that  
2       we're working on right now in the fuel cycle facilities,  
3       one of the thoughts is that if we actually determine  
4       that some materials that are currently put into the  
5       material access areas in those secured areas don't  
6       really credibly have to be there. Those activities  
7       that are performed at those plants can be performed in  
8       less secure areas which means that fewer people are  
9       gaining access to the most secure parts of the facility.

10               So, we're looking at a lot of those types  
11       of elements and risk-informing security.

12               MEMBER SCHULTZ:       I think the most  
13       important feature that -- well one of the most more  
14       important features that you'd be looking at, I didn't  
15       see it in a conference, but probably it's in the  
16       discussions is barrier evaluation and development.

17               MR. RIVERS:   Yes, if you look up -- yes.

18               MEMBER SCHULTZ:   Because the consequences  
19       are interesting. But in fact minor consequences could  
20       have a major impact on industry. So, the important  
21       features would be to assure that the event doesn't come  
22       to fruition.

23               So, a varied evaluation and opportunities  
24       to dissuade.

25               MR. RIVERS:   The barrier analysis is a

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1 very important part of this. It's a development of a  
2 lot of the things that I talked about.

3 CHAIRMAN STETKAR: I need to keep us  
4 moving here a bit because we have time slotted for a  
5 presentation by the industry. Another turn by UCS.  
6 And I need to get public comments and comments from the  
7 Committee. And I need to leave Michael enough time so  
8 that he doesn't have to speak too rapidly. So Michael?

9 MR. CALL: Thank you. Just wanted to give  
10 you a brief overview of some efforts that we're doing  
11 in the area of spent fuel storage in my division, which  
12 is the Spent Fuel Management Division in NMSS. This  
13 effort is relatively young. And so there hasn't been  
14 too much that's gone forward in it yet. So it's just  
15 we'll be bringing up to speed on the general outline  
16 of what it's like, what we're doing and the significant  
17 workshop that we had last month.

18 This effort we're looking to try to set up  
19 as a goal, we have a framework -- aiming for a framework  
20 to better enable risk-informed regulatory decisions in  
21 the areas of us looking at both spent fuel storage and  
22 transportation. But with the interest being mainly in  
23 transportation right now, we felt it's important to  
24 focus our efforts initially in spent fuel dry storage.

25 The reasons you know, like I said, this is

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1 relatively new. Some of the reasons for taking on this  
2 effort is partly because of understanding the  
3 NUREG-2150. Come out of the follow up efforts that  
4 we're talking about here today as well as public  
5 interactions where we present but we've received a  
6 petition for rule making from NEI where they felt if  
7 we made -- they proposed certain changes that they felt  
8 would be useful to make Part 72 of the storage  
9 regulations more risk-informed.

10 In our reports we're looking at trying to  
11 set up this framework through a process -- in taking  
12 seven major steps, looking to see what risk information  
13 is out there already. For example, you may be familiar  
14 with, there are a couple of PRAs that have been done.  
15 NRC did their own pilot PRA, which is NUREG-1864 as well  
16 as EPRI had done a PRA of their own.

17 So, just trying to identify what  
18 information is available. And the next step which is  
19 where our workshop from last month comes in, was to try  
20 to see where a defense-in-depth, how we would go about  
21 defining defense-in-depth for purposes of application  
22 and spent fuel storage. I believe that's the next  
23 slide. Yes, it's right there.

24 So, we had -- this workshop we had, held  
25 it on the 15th. It was well attended by both we had

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1 NEI participation and a number of public participants  
2 both in person as well as through the webinar that we  
3 had. In fact we had so many trying to register in that  
4 we -- assignment of a system telling people that we were  
5 overloaded, we can't take anymore.

6 So, maybe next time we have a public  
7 webinar we'll expand the number of lines that we make  
8 available for that. The NRC and NEI, we asked NEI to  
9 make a presentation on their views of what  
10 defense-in-depth would look like as well as presenting  
11 our own, and that is discussed a little bit more on the  
12 next slide.

13 For NRC we are looking and thinking in  
14 terms of threes. We're looking at three layers to  
15 ensure performance of three safety functions. And  
16 understanding how operations of spent fuel storage  
17 occur. Breaking that out as far as how we looked at  
18 it in terms of three different phases of operation.  
19 NEI's is more a -- applying more succinct way of looking  
20 at it in terms of identifying barriers, controls,  
21 personnel and so forth to prevent and contain or  
22 mitigate exposure to radioactive materials.

23 As I said, we had a number of public  
24 comments ranging from you know, in favor of you know,  
25 the NRC is looking at this as a good thing because it

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1 can help enhance and make the framework we've got now  
2 being more clear. And to help us identify what's  
3 really needed to be looked at in terms of certifying  
4 casks for storage.

5 There were some questions about the level  
6 of detail and some questions about different things  
7 such as well how are you going to determine if you have  
8 adequate defense-in-depth. And so there were some  
9 discussions on those points.

10 So that's where we are at this point. We're  
11 looking at taking the comments that we had from that  
12 meeting and putting together some kind of brief paper  
13 to consolidate that thinking. And then move to the  
14 next step which would be like I said, there are seven  
15 steps that we're looking at. I think we're looking at  
16 what are we going to use of making decisions, decision  
17 metrics. And how those would play into a decision  
18 process.

19 Eventually we're going to lay out a  
20 preliminary framework and then use a pilot -- selected  
21 a pilot to run that through and see where we need to  
22 make changes to that and finalize our approach before  
23 going forward with that.

24 So, if there are any questions? I know  
25 that that was a brief presentation. But this is where

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1 we are in terms of a significant activity in spent fuel  
2 storage.

3 MEMBER BALLINGER: Are you interfacing  
4 with the folks that are looking at license renewal for  
5 these casks and long term dry storage and things like  
6 that?

7 MR. CALL: License -- well, I realize --

8 MEMBER BALLINGER: You have a unique  
9 opportunity here.

10 MR. CALL: Right. I think I -- when we've  
11 been looking at these things as far as looking at what  
12 elements might be in each of these layers, we're not  
13 just looking at an initial storage period, but also  
14 looking at what might be things in a renewal period  
15 also. So there is some thinking toward that effort.

16 Like I said, we're relatively -- this is  
17 a relatively young and so as we go forward, we can  
18 definitely keep those things in mind to make sure that  
19 we reach out to that adequately.

20 MEMBER BALLINGER: I would encourage you  
21 to do that. Because there's a huge effort on defining  
22 what kind of inspections are going to be needed. And  
23 expensive. Very expensive inspections and technology  
24 which need to be balanced against other types of  
25 inspection which ensure that you don't get released

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1 material.

2 MR. CALL: Okay. Yes, we will definitely  
3 keep --

4 MR. LOMBARD: Actually if I may Ron, Bill  
5 Demoross.

6 MEMBER BALLINGER: Demoross, who is that?

7 CHAIRMAN STETKAR: Identify yourself sir.

8 MR. LOMBARD: I need records for a  
9 schedule of management. He can schedule management  
10 within NMSS and the folks who are developing HMS  
11 programs, managing regulatory framework are the same  
12 division, same compliance.

13 CHAIRMAN STETKAR: I'm sorry, we need your  
14 name on the record too.

15 MR. LOMBARD: Mark Lombard.

16 CHAIRMAN STETKAR: Thank you.

17 MR. LOMBARD: Yes, we deal very closely  
18 with NEI, the same folks who interfaced with us on other  
19 spent fuel storage issues almost on a weekly basis.

20 CHAIRMAN STETKAR: Any other questions?

21 (No response)

22 MR. CALL: And just moving on, as Dick  
23 mentioned earlier, I'm filing in for Dennis Damon.  
24 He's the NMSS Risk Analyst that would normally be making  
25 this kind of presentation. Just wanted to give you

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1 again, a brief informational presentation about some  
2 efforts that have gone on that are NMSS wide as well  
3 as just point to some things that are active in the  
4 different divisions within the NMSS.

5 Sometime ago there was a risk task group  
6 that was organized and developed a guidance document  
7 that's referred to as the Risk-Informed Decision Making  
8 document or RIDM. The current revision is -- we have  
9 one that was put out in February 2008.

10 But the activity started much earlier in  
11 a response to the SRM on SECY-99-0100. In that SECY  
12 just to give you a little bit of information, the  
13 staff's proposal to implement a framework for using  
14 risk assessment in regulating nuclear material uses and  
15 disposal was approved along with the proposal for  
16 addressing risk management issues in those areas  
17 including development of risk metrics and goals. And  
18 then there was a joint ACRS/ACNW subcommittee that was  
19 established to peer review those staff efforts.

20 The document itself has four objectives.  
21 To provide a step by step procedure on how to make  
22 risk-informed regulatory decisions. To suggest  
23 quantitative health guidelines. And provide a  
24 discussion of three regions of risk, which would be  
25 considered negligible, acceptable or tolerable I

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1 should say, not acceptable and negligible are the terms  
2 that they were using. And then to discuss how the RIDM  
3 method would be applied to nuclear material and waste  
4 regulatory areas.

5 In the SRM on SECY-04-0182, the Commission  
6 approved staff's plan to continue to apply  
7 risk-informed methods to these activities, materials  
8 and the waste repository activities and directed that  
9 the staff should consider applying the guidance in the  
10 document to planned and emergent activities. Next  
11 slide please.

12 So as I mentioned, part of the guidance  
13 that was developed and in the document itself there are  
14 quantitative health guidelines. They developed six.  
15 Two of which will look similar to the guideline -- to  
16 the goals that are for the reactor safety goals.

17 They're all in terms of individual risk.  
18 So that there are six. Three for the public, three for  
19 workers. In addition to acute fatality and serious  
20 injury or like in cancer fatality, the serious injury  
21 guideline was also adopted or suggested.

22 I would note that these are not -- unlike  
23 the safety goals for reactors, these are not endorsed  
24 by any type of Commission policy statement. And what  
25 they are, you'll notice that we've called them

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1 guidelines instead of goals. Instead of conveying a  
2 sense that these would be something that would need to  
3 be met at some point in the future or at some day, these  
4 are more of guidelines which would be anticipated  
5 according to the guidance document levels below which  
6 do you really need to consider doing much more to ensure  
7 that the risks are any lower than this.

8 MEMBER SKILLMAN: So these are thresholds  
9 for action?

10 MR. CALL: Kind of. Looking at -- yes.  
11 And they're not really -- it's not a hard and fast.  
12 It's kind of -- it's like I said, it's a guideline to  
13 suggest considering whether any further effort is  
14 needed. So whether you're in the negligible risk area  
15 and need to do anymore or not. Of course there will  
16 be other considerations that may weigh into that. But  
17 from a risk values perspective, that's where this is  
18 looking at.

19 MEMBER SKILLMAN: Thank you.

20 MR. CALL: On the next slide. To see if  
21 you know, since that time we note that these guidelines  
22 are not widely known or incorporated into  
23 risk-informing applications within the NMSS programs.  
24 However, there's various concepts have you know, the  
25 different groups are aware of the various other

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1 concepts in the guidance and made use of those as they  
2 felt was deemed appropriate. Just describing some of  
3 that here with the different organizations. The  
4 Economic Directorate, my division in terms of spent  
5 fuel storage, the fuel cycle and the materials and  
6 decommissioning.

7 And some of these are in terms of ongoing  
8 efforts. For example, in fuel cycle they're looking  
9 to revise their oversight program. And they feel that  
10 some of the milestones that they've set up for  
11 activities there would be well suited to employ  
12 guidance from, or consider guidance from the RIDM  
13 document.

14 On the next slide. In addition to that,  
15 just wanted to also make you aware that there have been  
16 various activities both past and ongoing within the  
17 different divisions that are risk-informing in nature  
18 or that support risk-informing efforts. Many of these  
19 if not all I would imagine are or have been or are  
20 currently listed on the NRC's public website. And it  
21 describes the different risk-informing activities of  
22 the Agency.

23 And then I've listed here some examples for  
24 the different areas. You'll see that this covers the  
25 range of what we regulate at NMSS.

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1                   And then that's the last slide, so if there  
2                   are any questions?

3                   MEMBER SCHULTZ:       Michael, are you  
4                   familiar enough with the fuel cycle effort with regard  
5                   to the integrated safety -- the overall plan as to know  
6                   what the schedule is there?

7                   MR. CALL:       For the revised oversight  
8                   program?

9                   MEMBER SCHULTZ:   Yes, exactly.

10                  MR. CALL:       That I'm not aware of the  
11                  schedule, no.   I just know that they are working  
12                  towards some.   They have an effort engaged in that  
13                  area.

14                  MEMBER SCHULTZ:   I'll look it up.  
15                  Thanks.

16                  CHAIRMAN STETKAR:   Any other questions  
17                  for Michael or the staff?

18                  (No response)

19                  CHAIRMAN STETKAR:   If not, thank you all.  
20                  It's good overview of not only the RMRF initiative, but  
21                  what's going on in the other areas that would be  
22                  affected by the integrated policy statement and  
23                  regulatory framework.

24                  With that I'd like -- we have next on the  
25                  agenda a slot for NEI.   If you have some comments to

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1       come up.

2                   Mike, we haven't received any material  
3       from the slide or whatever.

4                   MR. TSCHILTZ:   No.   No.

5                   CHAIRMAN STETKAR:   Or is it just -- okay.  
6       It will be on the record.

7                   MR.     TSCHILTZ:           Certainly.        I  
8       contemplated developing slides for this discussion,  
9       but when I was initially asked to come and speak before  
10      the Committee, it was under the presumption that the  
11      paper would be available and the industry would have  
12      an opportunity to comment.

13                   And so I think my comments won't be so much  
14      aimed at the content or the presumed content of the  
15      paper, but more at a higher level as to where we're going  
16      with this initiative and where the industry may come  
17      out as far as seeing the benefit or not seeing the  
18      benefit.   I guess just looking at the process for  
19      moving forward, you know, Dick Dudley described the  
20      white paper followed by a public comment period  
21      followed by potentially a meeting to discuss a  
22      resolution of comments.

23                   One perspective I would offer is that these  
24      initiatives seem to be voluntary initiatives.   And  
25      they're not something that would be imposed upon the

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1 licensee, it would be something that they would  
2 voluntarily apply for and implement similar to NFPA-805  
3 or Option Two was the example that was given there.

4 So, the observation that I would have is  
5 that NUREG-2150 was developed and written by an NRC Task  
6 Force with little public involvement. The development  
7 of the white paper, the Options is being developed with  
8 little public involvement. Just one opportunity it  
9 appears for stakeholder feedback on the white paper.

10 So, my concern is that there's going to be  
11 a lot of effort potentially put into the development  
12 of Options that there's no clear identified person or  
13 utility that would implement it. So to me, it seems  
14 that it needs to be more closely linked to the people  
15 -- the development of the Options need to be more  
16 closely linked to the people who would ultimately  
17 implement that.

18 So, in separation of those two activities,  
19 I think is problematic. And the reason that I wouldn't  
20 offer more detailed comments I think are the devil's  
21 in the details. I think whether these Options are  
22 looked upon favorable and then people decide to  
23 implement them are largely based upon the details that  
24 are going to be developed for the Options.

25 So in that regard I think it's very

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1 important that you know, we allow sufficient time in  
2 the development of these Options for meaningful  
3 interactions. And I would say it would be beneficial  
4 to look at a potential examples of applications for  
5 Option Two.

6 Just looking at Option Three on the  
7 surface, it would appear that it's what I would  
8 characterize as a heavy lift. And with all of the other  
9 activities going on in the post-Fukushima era here,  
10 there's a lot to consider. So, someone's volunteering  
11 to take that on, at this stage I think that would be  
12 questionable. But I think that's something that we  
13 need to explore as we move forward.

14 The other observation I would offer is that  
15 the industry and the NRC have formed risk-informed  
16 steering committees. And there's joint meetings where  
17 the industry's steering committee meets with the NRC's  
18 steering committee. And they identify the issues that  
19 they think are most important to be addressed in the  
20 near term as far as risk-informed regulation.

21 And I think if you look at what we focused  
22 on in the past year and the things that we're focusing  
23 on in the coming year, it's going to identify the things  
24 that are really issues that people face right now that  
25 they need answers to. For example, this year one of

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1 the issues was PRA realism. And to a large degree that  
2 was as a result of some of the issues that arose during  
3 the development of fire PRAs for NFPA-805.

4 And the industry has a sense of urgency in  
5 the need to resolve those issues with fire PRAs because  
6 of the consequences of having these conservatisms. So  
7 -- and the potential negative consequences and  
8 diversion of resources to things that don't have a true  
9 safety benefit.

10 So, I would say the risk-informed steering  
11 committee is a good place and this is -- this issue,  
12 the RMRP is one of the topics that the staff steering  
13 committee has raised as a potential, one to be  
14 considered in 2015. But I think the industry is  
15 looking at more practical application, things that can  
16 be used in the near term. The treatment of uncertainty  
17 in decision making. Aggregation of risk and  
18 development of external vent PRAs.

19 The flooding PRAs being an issue. I know  
20 you've heard of the challenges that the industry and  
21 the staff has faced with evaluating flooding hazards  
22 to the deterministic methods that are used per site in  
23 new reactors and the challenges that are created by  
24 that. And not having a risk-informed or accepted  
25 risk-informed method for dealing with those hazards.

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1           So, I would say that being said, I mean,  
2           we're ready. I have a small working group formed to  
3           review the paper when it's issued. And we'll provide  
4           our comments and engage the staff.

5           I think the general belief out there I  
6           think from when NUREG-2150 was initially issued was  
7           that the regulatory framework doesn't really need to  
8           be revamped at this stage. That our efforts would be  
9           better spent encouraging and sustaining the existing  
10          policies that have been put in place with the PRA policy  
11          statement that exists.

12          And there's still a lot of work to be done.  
13          We heard comments today on defense-in-depth. It has  
14          just been out there since the initial implementation  
15          of misconformed regulation. And people still struggle  
16          with how to apply those concepts. So I think we can  
17          clearly make progress in those areas in an evolutionary  
18          way as opposed to a revolutionary way of reframing the  
19          regulations.

20          So I'll stop there and take any questions.

21          CHAIRMAN STETKAR: Any questions for  
22          Mike?

23          (No response)

24          CHAIRMAN STETKAR: Thank you very much for  
25          your comments. And again, I share your frustration

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1 about not having something more substantive to actually  
2 comment on. But, that's the way it is. We will have  
3 that opportunity in the future. And I'm sure you'll  
4 be back.

5 MR. TSCHILTZ: Thanks.

6 CHAIRMAN STETKAR: And we have a request  
7 from Union of Concerned Scientists. So I believe Ed  
8 Lyman is here. Is Ed here? Oh, is he on -- okay. Ed  
9 is apparently out there screaming at his communication  
10 device. Ed, we'll get the line open for you in a second  
11 here.

12 MR. LYMAN: Hello?

13 CHAIRMAN STETKAR: Ed, are you there?

14 MR. LYMAN: Yes. Can you hear me?

15 CHAIRMAN STETKAR: Yes, we can.

16 MR. LYMAN: Yes. I apologize for not  
17 being there in person today.

18 CHAIRMAN STETKAR: No. That's fine.

19 MR. LYMAN: So, as always we appreciate  
20 the opportunity to provide comments. But I don't want  
21 to pile on here. But again, we were also expecting to  
22 get the white paper to comment on. And so without  
23 having that, my remarks are just going to be reactions  
24 to some of what I've heard this morning.

25 With regard to the risk management

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1 regulatory framework, I guess there are two separate  
2 aspects here. One is the -- is it appropriate to  
3 implement this policy statement Agency wide for all  
4 aspects, even those where there may not be a clear or  
5 useful application of risk management concepts? And  
6 I think the answer to that is no from our perspective.

7 One clear example being security. I am  
8 glad to hear that there doesn't seem to be an effort  
9 to try to quantify the unquantifiable with regard to  
10 initiating events for security. But that's certainly  
11 something we would not support.

12 The other aspect is are the -- is what we  
13 heard with regard to the Power Reactor Options on  
14 appropriate. And I think the answer to that is also  
15 no. I think there is a great need for the Agency to  
16 clarify the way risk is being used to clear up some of  
17 the issues and inconsistencies. And it doesn't sound  
18 like this particular vehicle is going to accomplish  
19 that. And you may not hear this very often, but I  
20 totally agree with the NEI speaker about I think the  
21 --

22 CHAIRMAN STETKAR: There's laughing going  
23 on in the room Ed, if you can't hear it.

24 MR. LYMAN: But I actually am going to say  
25 the same thing. I don't see how what the elements of

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1 the policy statement that were presented are any  
2 improvement over the PRA policy statement. In fact I  
3 think it may be a step backward.

4 For instance, I'm concerned about the  
5 first bullet which sounds to me would perhaps the plant  
6 adequate protection or equate adequate protection with  
7 the idea that that's really risk management. And I  
8 don't think you can really justify and I think risk  
9 management is the only aspect of adequate protection.  
10 And I'm concerned about the implications, the legal  
11 implications of a statement like that.

12 I would say adequate protection is  
13 probably closer to risk-minimization. Or that would  
14 be our hope then risk management. You could always  
15 keep in mind that you know, the public is one of the  
16 customers of this policy statement and I think the  
17 Agency needs to focus on improving the priority with  
18 how it applies in it's decision making. And I don't  
19 see that happening here.

20 One aspect I think that highlights it, we  
21 heard how NFPA-805 was actually it sounds like it's  
22 leading to greater inconsistencies between those who  
23 voluntarily choose to implement it and sign  
24 vulnerabilities that require correction and those who  
25 don't. And that seems to be going in the wrong

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1 direction.

2           So until that problem is fixed, it doesn't  
3 seem like it's a good model for going forward. And I  
4 don't see how Option Two, clearly industry is not going  
5 to want to go on a hunt for unrectified vulnerabilities  
6 that they're going to have to pay to fix. So that --  
7 to expect that that's going to be a reasoned outcome  
8 of this process is not a reasonable expectation. So  
9 if it were going to happen, I think it would have to  
10 be a mandatory Option Three type.

11           We've made pitches in the past for a new  
12 vulnerability, you know, systematic vulnerability  
13 assessment across the whole fleet so that you can at  
14 least get consistency. And it seems to increase  
15 inconsistency by allowing this process to be voluntary  
16 would make matters worse.

17           So I think that's all I have to say on that.  
18 On risk-informing security, we have some views on the  
19 material attractiveness rule making that Joe Rivers is  
20 well familiar with. I won't rehash them here, but I  
21 think Dr. Rempe's comment goes to one of our main  
22 concerns, that material attractiveness is not an  
23 intrinsic aspect of material properties.

24           But it does imply some modeling or  
25 presumption of an adversary, their capabilities and

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1 their contentions. And that has to be accounted for  
2 better in the rule making process to make clear that  
3 there is some target adversary in mind when you're  
4 talking about what materials are attractive and what  
5 are less attractive.

6 The last point I wanted to make has to do  
7 with defense-in-depth for spent fuel. I think here is  
8 this is an area where there might be some value in  
9 considering risk. And we think that if you apply the  
10 defense-in-depth, the metric for evaluating the  
11 expedited fuel transfer issue as I said before, that  
12 that would make expedited fuel transference dry casks  
13 look more attractive then if you've done a cost benefit  
14 analysis expected.

15 So I would hope that that program would  
16 also be applied not just to spent fuel in dry storage  
17 but also comparative of risks of densely packed spent  
18 fuel pools compared to dry storage.

19 And I think that's all I have. Thank you.

20 CHAIRMAN STETKAR: Thank you very much.  
21 I've lost track of what lines are open. Was Ed on the  
22 general public line?

23 MR. SNODDERLY: No. Ed was on the staff  
24 line.

25 CHAIRMAN STETKAR: Was on the staff line.

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1 Okay. Let me ask, as long as we have the staff line  
2 open, are any other members of the staff out there that  
3 wanted to make any comments on anything? As long as  
4 we have your line open.

5 MR. HARRISON: No comments here.

6 CHAIRMAN STETKAR: Okay. Thank you.  
7 What we'll do then is open up the other line, which is  
8 the public line. And while we're doing that, let me  
9 ask if is there anyone in the room that has any comments  
10 that you'd like to make? Please come up and do so.

11 Now, if there's a member of the public out  
12 there, because of our high tech system here, could you  
13 just please say something, hello or anything so that  
14 we can confirm that your line is open.

15 (No response)

16 CHAIRMAN STETKAR: It's always  
17 troublesome.

18 MR. SNODDERLY: There wasn't anybody.

19 CHAIRMAN STETKAR: Okay. We have  
20 indications that there isn't anyone on the public line.  
21 And if that's the case, then thank you all for your  
22 comments. And again, NEI and Ed Lyman, you're on the  
23 record for the meeting. So, we have your comments.

24 What we always do at the end of one of these  
25 Subcommittee meetings, I'll go around the table and ask

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1 each Member if you have any final comments that you'd  
2 like to make. And also, if -- ask whether you think  
3 that at this stage in the game it merits bringing the  
4 issue before the full Committee.

5 I always like to get a little feedback from  
6 other Members on that topic in terms of timeliness.  
7 And because Joy got a chance to go last a few days ago,  
8 you can go first today.

9 MEMBER REMPE: Oh. I wanted to thank you  
10 for the presentations and comments. I look forward to  
11 the white paper when it's released. I would encourage  
12 us to have another Subcommittee -- my viewpoint is we  
13 should have another Subcommittee meeting after the  
14 white paper is released. And then I would take it to  
15 the full Committee. I think at this time that we're  
16 going before the paper is released to the full  
17 Committee.

18 CHAIRMAN STETKAR: Charlie?

19 MEMBER BROWN: Same comment on the  
20 presentations. Got something out of it. And I agree  
21 with Joy that we ought to get the white paper done first  
22 before we go to the full Committee.

23 CHAIRMAN STETKAR: Ron?

24 MEMBER BALLINGER: Same.

25 CHAIRMAN STETKAR: It's going quick.

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1 Mike?

2 MEMBER RYAN: It's a work in progress.  
3 And I agree with the comments from my colleagues.

4 CHAIRMAN STETKAR: Dennis?

5 MEMBER BLEY: I agree with them except we  
6 might want to wait until the public comments are in on  
7 the white paper before we take it to the full Committee.

8 CHAIRMAN STETKAR: Okay. Dick?

9 MEMBER SKILLMAN: Yes, I agree with Dr.  
10 Rempe. I'd like to hear again after we see the white  
11 paper, after the public comments, that would probably  
12 be better. But I also want to thank Dick and Joe for  
13 putting up with my focused questions. Thank you Dick  
14 Dudley and Joe.

15 CHAIRMAN STETKAR: Steve?

16 MEMBER SCHULTZ: I appreciate the  
17 presentations and also the -- got the involvement by  
18 both the staff and the other organizations that have  
19 provided input to us today. And would suggest that we  
20 have the Subcommittee meeting as we get the additional  
21 information and join in with the public comment period.

22 CHAIRMAN STETKAR: Yes. My inclination  
23 -- thanks. You have -- well, my inclination is to do  
24 that Dick. Is that you're path forward that identified  
25 interactions with the Subcommittee I think during the

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1 summer period. I think we want to probably interact  
2 with you earlier than that so that you have the benefit  
3 of the Subcommittee feedback in parallel with the  
4 public comments.

5 And then see where we go after all of the  
6 public comments are in and you have a final version of  
7 the paper you know, later in the year. So, I think  
8 we'll probably be looking at scheduling a Subcommittee  
9 meeting in the April/May time frame. Well have to  
10 figure out a slot to put that in. But I think earlier  
11 the better I think is what you're hearing from us.

12 MEMBER BLEY: You want to wait until after  
13 they have that meeting I would think.

14 CHAIRMAN STETKAR: I think we want to wait  
15 until after they have that meeting. But not  
16 necessarily wait until they have all of the public  
17 comments and are working on the you know, the final  
18 draft.

19 And with that, if there are no other  
20 comments, we are adjourned.

21 (Whereupon, the above-entitled matter  
22 went off the record at 11:30 a.m.)  
23  
24  
25

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# **Staff Recommendations Regarding a Risk Management Regulatory Framework**

**Briefing for ACRS Subcommittee**

February 20, 2015



# Outline of Staff Presentation on Risk Management Regulatory Framework (RMRF)

- Background and Current Approach (R. Dudley)
  - Agency-wide Policy Statement
  - Implementation Options for Power Reactors
  - Path Forward
- Status of Risk-Informed Activities Regarding Common Defense and Security (Joe Rivers)
- Status of Risk-Informed Activities Regarding Spent Fuel Dry Storage (Michel Call)
- Status of Risk-Informed Activities Regarding Nuclear Materials Licensing (Dennis Damon/Michel Call)

# Summary: Background and Current Approach to Evaluate Risk Management Regulatory Framework

- Chairman's Tasking Memorandum of June 14, 2012 directed staff to "review NUREG-2150 and provide a paper to the Commission that would identify options and make recommendations, including the potential development of a Commission policy statement."
- Commission's May 19, 2014 SRM on Near-Term Task Force Recommendation 1:
  - Directed staff to reevaluate objectives of Improvement Activity 1 (new design-basis extension category) and Improvement Activity 2 (adequacy of defense-in-depth) within context of Commission direction on long-term Risk Management Regulatory Framework
  - Closed NTTF Recommendation 1
  - Increased scope of RMRF SECY paper (describe relationships between ongoing risk-informed activities)
- Staff has requested extension of due date until December 2015
- Management has re-evaluated the staff's approach to evaluating agency-wide RMRF
  - Staff will consider 3 RMRF implementation options for power reactors
  - Staff will also ask Commission to consider an overarching, agency-wide risk management policy statement

# Overview of Agency-wide Policy Statement

- Applicable to all NRC-regulated program areas (radiological safety and security)
  - A risk management approach would be used to ensure adequate protection of public health and safety and promote the common defense and security for all NRC regulatory activities.
  - In a risk management approach, safety and security are ensured by (1) understanding the risk associated with NRC-regulated activities and (2) using that risk information to make regulatory decisions.

# Overview of Agency-wide Policy Statement (continued)

- The risk management approach would:
  1. Use a structured process to identify issues, develop and analyze options, make decisions, and monitor the effectiveness of regulatory programs to make improvements as necessary,
  2. Ensure appropriate regulatory controls and oversight are in place recognizing the variety of risks associated with different uses of radioactive materials, and
  3. Employ risk-informed decision-making, in which risk insights are considered together with other factors commensurate with their importance to public health and safety and common defense and security.

# Overview of Agency-wide Policy Statement (continued)

- The technical analyses supporting the risk-management approach should:
  1. Be based on sound data, information, and methodologies, including consideration of uncertainties,
  2. Use techniques or combinations of techniques appropriate for the hazards and complexity of the issue,
  3. Be as realistic as practicable, and
  4. Promote and utilize advances in science and technology, as practicable.

# Three Power Reactor Implementation Options

- Option 1 – Maintain Current Framework
- Option 2 – Voluntary Alternative Risk-Informed Licensing Basis
- Option 3 – Plant Specific Risk Management Regulatory Framework from NUREG-2150

# Power Reactor Option 1 – Maintain Current Framework

- No overall revision of NRC's regulatory framework
- The current power reactor regulatory framework meets the RMRF criteria in NUREG-2150, Chapter 4 - Option A
  - Commission Safety Goal Policy sets forth the "risk management objective"
  - Current regulations implement sufficient protections (e.g., defense-in-depth and safety margins) corresponding to NUREG-2150 "risk management goal"
  - NRR's LIC-504 sets forth a risk-informed decision process with steps consistent with those described in NUREG-2150
  - NRC has numerous monitoring and feedback mechanisms to (1) gage the efficacy of regulatory decisions and (2) identify new information that should be considered within the regulatory framework
- Not a "do nothing" option -- staff would still make safety improvements (based on risk insights or other considerations) whenever deemed necessary using existing regulatory processes

# Power Reactor Option 2 – Voluntary Alternative Risk-Informed Licensing Basis

- Maintain existing generic regulatory structure
- Issue rule allowing licensees who upgrade PRAs to apply for approval of a licensing basis that would support a performance-based, risk-informed alternative to certain deterministic regulations of low safety benefit
  - Licensees allowed to select a plant-specific set of design changes/compliance issues of low risk-significance that would deviate from current deterministic requirements (NRC or self-approval) **and** must search for and mitigate all plant-specific risk vulnerabilities meeting NRC-specified criteria
  - New information on mitigation of risk-significant events and/or accident sequences (risk vulnerabilities) must be documented in an updated Final Safety Analysis Report (FSAR) in accordance with 10 CFR 50.71 (e) requirements
  - Mandatory monitoring and feedback (as described in RG 1.174) to ensure changes in risk remain acceptable throughout the lifetime of the facility



# Power Reactor Option 2 – Voluntary Alternative Risk Informed Licensing Basis (continued)

- Regulatory process for licensees to self-approve certain plant-specific changes would be similar to NFPA-805 approval process, i.e., risk-informed changes allowed to license requirements without prior NRC approval if risk increase ( $\Delta$  CDF) is “no more than minimal” (e.g.,  $< 1\text{E-}7/\text{year}$ )
- Changes with risk increases “more than minimal” (e.g.,  $> 1\text{E-}7/\text{year}$ ) require NRC approval
- Plant licensees are expected to have upgraded, high quality PRAs to support this risk-informed alternative licensing basis approach

# Power Reactor Option 3 – Plant-Specific RMRF from NUREG-2150

- Require PRAs and establish plant-specific licensing basis based on:
  - Plant-specific risk profiles
  - NRC-specified risk management objective
- Structured, risk-informed decision-making process used by both NRC and licensees
- Based on the risk profile, licensees would implement the plant-specific licensing basis by:
  - Determining how the risk objective is met
  - Ensuring that the necessary protections are in place to meet the risk management goal
  - Establishing the risk-informed decision-making process
  - Establishing the monitoring/feedback and reporting process

# Power Reactor Option 3 – Plant-Specific RMRF from NUREG-2150 (continued)

- Each plant's licensing basis would consist of:
  - "Technical requirements" based upon plant-specific attributes and applicant-selected design specific elements/constraints
  - Rationales (technical bases) why the technical requirements adequately address risk and defense-in-depth in light of the plant-specific attributes and design specific elements/constraints
  - FSAR-level description of the plant-specific attributes and applicant-selected design specific elements/constraints that are the inputs/assumptions for the above rationales (technical bases) which must be maintained
  - Process for maintaining the validity of the rationales (technical bases) throughout the operating lifetime of the facility.
- Licensees would be required to use the structured process with monitoring and feedback to ensure that the plant-specific licensing basis remained consistent with the risk profile of the plant, which could change over time.

# Path Forward on RMRF

- Draft white paper and outline of policy statement now being reviewed by NRC Senior management
- Incorporate management comments into updated draft white paper and release to public
- Public meeting (late April) to discuss draft white paper
- Solicit written public comments on later version of white paper via [www.regulations.gov](http://www.regulations.gov)
- Summarize public comments and meet again with ACRS (summer)
- RMRF SECY paper currently due to Commission on December 18, 2015

# Backup Slides

# Definitions

To ensure a common understanding of this example policy statement, it is important to know the differences between the terms “risk management,” “risk assessment”, and “risk-informed approach.”

- *Risk management* is the recognition of the threat or danger involved with the use of nuclear materials and establishing controls and oversight to manage the potential threat or danger. That is, it is coordinated activities to direct and control an organization with regard to risk. [From ISO 31000, “Risk Management – Principles and Guidelines”]
- *Risk assessment* is the evaluation of what can go wrong, how likely is it, and what would be the consequences? This consideration may be addressed either qualitatively or quantitatively. [From SRM-SECY-98-144, “White Paper on Risk-Informed and Performance-Based Regulation,” March 1999]

# Definitions (continued)

- *Risk-informed approach* to regulatory decision-making represents a philosophy whereby [quantitative and qualitative] risk insights are considered together with other factors to establish requirements that better focus licensee and regulatory attention on design and operational issues commensurate with their importance to public health and safety. A risk-informed approach enhances the deterministic approach which is used to define many of the design and operational requirements for NRC licensees. Risk-informed approaches lie between the risk-based and purely deterministic approaches.  
*[From SRM-SECY-98-144, "White Paper on Risk-Informed and Performance-Based Regulation," March 1999]*

# NUREG-2150 Hierarchy and Structured Decision-making Process

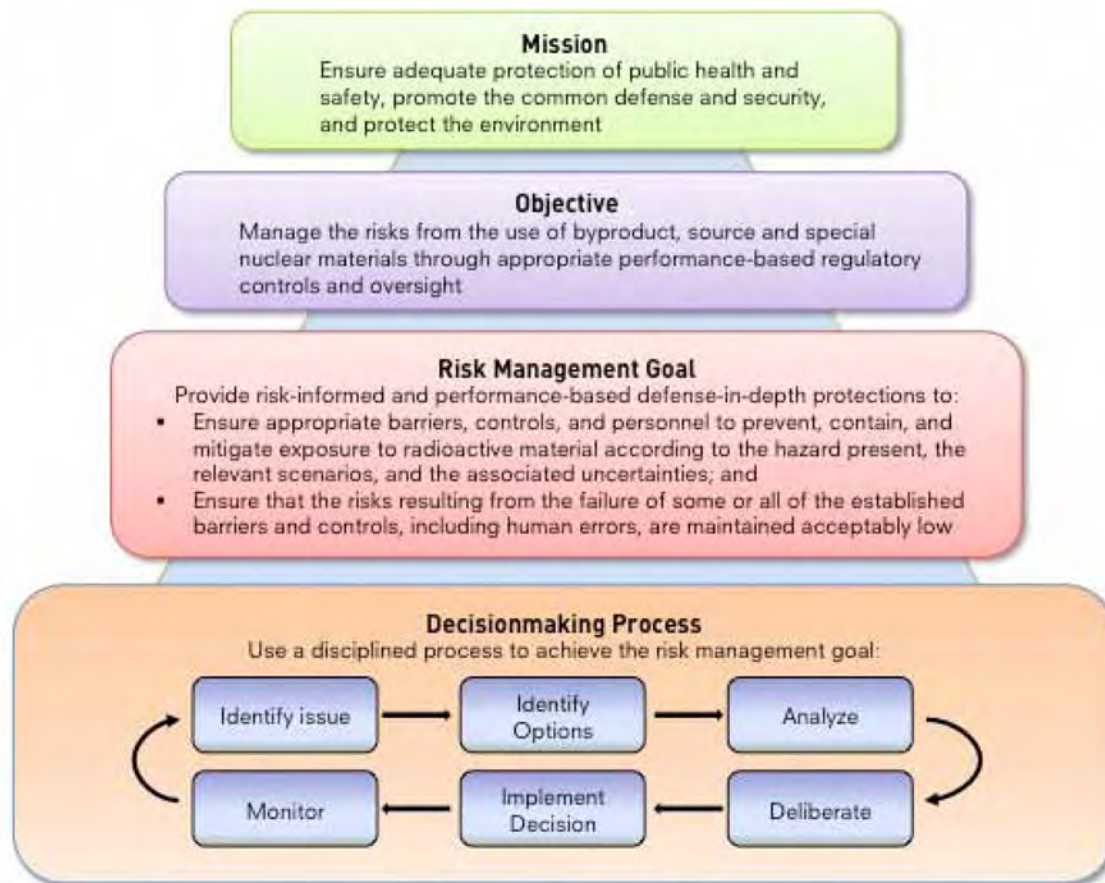


Figure ES-1 A Proposed Risk Management Regulatory Framework





# **Status of Risk-Informed Activities Regarding Common Defense and Security**

Joe Rivers, NSIR

February 20, 2015

ACRS Subcommittee Meeting

# **NRC Sandia Workshop 2010**

- Six Areas of Opportunity Identified
  - Uncertainty of initiating events
  - Simulation tools
  - Collaboration between safety/security
  - Cyber Security
  - Improved metrics
  - Demonstration project like WASH 1400

# February 2014 INMM Workshop

- Safety/Security Risk Approaches
- Material Attractiveness
- Likelihood of Event
- VA Simulation Tools
- Cyber Security

# **Safety/Security Risk Approaches**

- Discussion of PRA at NRC
- Presentation of an extensible risk informed decision support method
- Implications of security challenges for safety assessment tools
- DNDO risk models

# Material Attractiveness

- NRC approach under development
- DOE support for NRC approach
- NGO thoughts on approach
- Industry thoughts
- UK comments on concept of dilution
- French presentation on security at civilian facilities

# Likelihood of Event

- Surveys of possible approaches and options
- Discussions of how approaches might be used
- National Consortium for the Study of Terrorism and Responses to Terrorism approach

# VA Simulation Tools

- ARES Corporation – AVERT
- Rhino Corp – Simajin
- Sandia modelling
- DTRA modelling
- PNNL tool to address physical and cyber attacks

# Cyber Security

- Discussion of pros, cons and challenges of risk informing cyber security
- NRC regulatory program
- PNNL cyber risk model



# Current Activities

- Risk Prioritization Initiative
- Risk Management Regulatory Framework Working Group
- Use of Simulation Modelling
- Material Attractiveness
- Cyber Security
- NUSAM

# Risk Prioritization Initiative

- Attempt to prioritize plant projects informed by risk associated with safety, security, emergency preparedness, and radiation protection
- Industry Pilots conducted

# **Risk Management Regulatory Framework Working Group**

- Addressing recommendations of RMRF Task Force
- First, focus on reactor safety
- Expand to other disciplines
- Include concept of defense in depth
- Look at beyond design basis accidents

# Use of Simulation Modelling

- Industry initiative to incorporate vulnerability assessment modelling tools into regulatory process
- Industry pilot to model a number of NPPs
- NRC staff assessing process to determine requirements for use in regulatory process

# Material Attractiveness

- Development of an approach to grade security based on the attractiveness of the nuclear material to the adversary
- Approach allows alternative measures to be applied for varying levels of dilution
- Will apply to fuel cycle facilities and RTRs

# Los Alamos Model

- Logic model developed
- Four modules
  - Acquisition
  - Processing
  - Weaponization
  - Yield reduction
- Provides an estimate of likelihood

# Cyber Security

- Reactor cyber security implementation under way
- Highest consequence critical digital assets (CDAs) addressed
- using a consequence based approach to consider lesser requirements for CDAs with lower consequences

# NUSAM

- IAEA Coordinated Research Project
- Develop guidance on the conduct of security assessments
- Case Studies
  - NPP
  - Irradiator Facility
  - Rad Material Transport
  - LEU Fuel Fabrication Facility
  - Spent Fuel Storage Facility



# Upcoming Workshops

- INMM Reducing Risk Workshop
- INMM/ANS Workshop on Safety/Security Risk
- INMMWorkshop on VA Tools

# **INMM Reducing Risk Workshop**

- March 2015 in Washington, DC
- Session on Cyber Security
- Focus on risk approaches that might apply to cyber security

# **ANS/INMM Workshop on Safety/Security Risk**

- April 2015 in Sun Valley, Idaho
- Engage safety and security risk professionals in a discussion of risk applied to their discipline

# **INMM Workshop on VA Tools**

- September 2015 in Boston
- Discussion of VA Tools
- Discussion of VV&A
- Discussion of modelling issues
- Discussion of data
- Demonstration by Vendors
- Discussion by users
- Panel Discussion

# Questions ?



# **Risk Informing Spent Fuel Dry Storage**

Michel Call

Division of Spent Fuel Management

Office of Nuclear Materials Safety and  
Safeguards

# Risk-Informing Effort

- Prompted by agency activities and stakeholder interactions
- Goal – framework to better enable risk-informed regulatory decisions
- Focus – initially on spent fuel dry storage
- Approach – 7 major steps

# Defense-in-Depth Public Workshop

- Definition and application in dry storage, one major step
- Held public workshop Jan 15, 2015
- Well attended with good public and industry participation
- NRC and NEI presentations



# Defense-in-Depth Approaches

- NRC
  - 3 layers (engineered, programmatic, and mitigating controls)
  - 3 safety functions (sub-criticality, radiation exposure, radioactive materials release)
  - 3 operations phases (loading/transfer, storage, unloading)
- NEI
  - Barriers, controls, etc. to prevent, contain, mitigate exposure to radioactive materials

A stylized atomic symbol logo is located in the top-left corner of the slide. It features a central blue circle with three intersecting white elliptical orbits, all set against a blue background that curves along the left edge of the slide.

# **Risk Informing in NMSS**

Michel Call

Division of Spent Fuel Management

Office of Nuclear Materials Safety and  
Safeguards

# Risk-Informed Decisionmaking (RIDM)

- Guidance document developed by NMSS Risk Task Group
- Current Revision (Rev 1) from February 2008 (ML080720238)
- Response to SRM-SECY-99-0100
- 4 objectives of the RIDM document
- Commission Approval in SRM-SECY-04-0182

# Quantitative Health Guidelines (QHGs)

- 6 Guidelines

	<b>Public</b>	<b>Worker</b>
Acute fatality	$\leq 5 \times 10^{-7}/\text{yr}$	$\leq 1 \times 10^{-6}/\text{yr}$
Latent cancer fatality	$\leq 2 \times 10^{-6}/\text{yr}$ or 4 mrem/yr	$\leq 1 \times 10^{-5}/\text{yr}$ or 25 mrem/yr
Serious injury	$\leq 1 \times 10^{-6}/\text{yr}$	$\leq 5 \times 10^{-6}/\text{yr}$

- Not endorsed by Commission policy statement
- Guidelines vs. Goals

# Use of RIDM & QHGs

- QHGs are not widely known or incorporated into risk-informing applications
- NMSS programs
  - Yucca Mountain – risk-informed regulation and guidance in place, pre-dates RIDM and QHGs
  - Dry Spent Fuel Storage – consideration in effort to risk-inform dry storage
  - Fuel Cycle – consideration/application in revised oversight program development
  - Materials and Decommissioning – have made use of various concepts from RIDM

# Other NMSS Risk-Informing Efforts

- Variety of Activities past and present
- Current activities described on NRC's website
- Examples of Activities (past and present)
  - NUREG-1556 Series – Guidance about Materials Licenses
  - Part 61 rulemaking – Land disposal of radioactive waste
  - Fuel Cycle – Integrated Safety Assessment, Part 70 Subpart H
  - Yucca Mountain – Part 63, Performance Assessment
  - Spent Fuel Transportation – Fire Studies