UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
***
BRIEFING ON SHUTDOWN RISK PROPOSED RULE
FOR NUCLEAR POWER PLANTS
***
PUBLIC MEETING
***
Nuclear Regulatory Commission
Commission Hearing Room
11555 Rockville Pike
Rockville, Maryland

Wednesday, August 6, 1997

The Commission met in open session, pursuant to notice, at 2:00 p.m., the Honorable SHIRLEY A. JACKSON, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:
SHIRLEY A. JACKSON, Chairman of the Commission
GRETA J. DICUS, Member of the Commission
EDWARD McGAFFIGAN, JR., Member of the Commission
NILS J. DIAZ, Member of the Commission

STAFF AND PRESENTERS SEATED AT COMMISSION TABLE:
JOHN C. HOYLE, Secretary
STEPHEN G. BURNS, Associate General Counsel
JOSEPH CALLAN, EDO
GARY HOLAHAN, Director, Division of Systems Safety and Analysis, NRR
TIM COLLINS, Team Leader, Shutdown Rulemaking Task Force
TIM MARTIN, Acting Associate Director for Technology
THOMAS KING, Deputy Director, Division of Systems Technology, RES

P R O C E E D I N G S

[2:00 p.m.]

CHAIRMAN JACKSON: Good afternoon, ladies and gentlemen. We are pleased to have the staff here to brief the Commission on the proposed rulemaking for shutdown and fuel storage pool operations at nuclear power plants.

In a September 12, 1994, staff requirements memorandum, the Commission approved the publication of the proposed rule for shutdown and low-power operations for public comment. The staff has expended a considerable

amount of effort to address the public comments as well as the Commission guidance regarding the use of a risk informed performance-based approach for this important issue.

During your discussion of the proposed rulemaking for shutdown and fuel storage pool operation, the Commission is interested in examples which demonstrate the use of the risk-informed performance-based approach in development of this rule. In addition, the Commission is interested in hearing any lessons learned that could improve the rulemaking process in the use of risk.

An initial comment I would make is it is important, whether it is on your viewgraphs or not, that you kind of lay out or give some sense of the context in historical -- the historical context, particularly since this Commission is not the same as the Commission that

issued the SRM in 1994.

I understand that copies of the presentations are available at the entrances to the meeting room so, unless my colleagues have anything to add to begin, Mr. Callan.

MR. CALLAN: Thank you, Chairman. Good afternoon, Chairman, good afternoon, Commissioners.

With me at the table are Tim Martin, who is filling in for Sam Collins, who is not available, and Gary Holahan, the director of the Division of System Safety and Analysis in the office of NRR.

Gary will introduce the members of the Shutdown Rulemaking Task Force and then Tim Collins, who is the team leader of the task force and, I might add, Tim is a very recent -- very recent selectee as the new branch chief, SES branch chief for the Reactor Systems Branch --

CHAIRMAN JACKSON: Are you going to announce Mr. Martin?

MR. CALLAN: We have a yellow announcement on that.

And Tim Martin, it is worth saying for the record, Tim Martin is the new office director of the Office of AEOD. But for this meeting, they are going to be in their old capacities and Tim Collins will proceed with the balance of the presentation when Gary Holahan is finished with his discussion.

CHAIRMAN JACKSON: I have to tell you, though this has no relevance to the meeting, but someone started talking to me about a Tim Collins, in fact, Mr. Callan, earlier today. And I thought he was confusing and lending Tim Martin and Sam Collins but I see there really is a Tim Collins.

[Laughter.]

MR. HOLAHAN: I have had that problem myself.

Back in January of 1997, in response to a number of internal and external comments on the staff's previous efforts to develop a shutdown rule related to, Madam Chairman, as you mentioned, the 1994 SRM. We recognized that there were a substantial number of public comments and, in the time frame between the early '90s and now in the later '90s, I think we have had some additional time to think about what do risk-informed and performance-based approaches to rulemaking mean.

So back in the beginning of this year, we really stepped back to take a new look at how to address shutdown rulemaking activities, to take public comments and sort of a risk-informed approach in mind and we established a task force and we gave them a due date of July 31 to produce a

rule and supporting data. In fact, I think they met that date by one day. That is a pretty good performance by our rulemaking standards, I'm afraid. And Mr. Collins, who is

6

the leader of that task force, will present the details of that package.

But I would also like to present the members of that team so that you have a feeling for the scope and, in fact, the level of effort involved in producing this sort of activity.

Eric Weiss is the -- sort of the associate team leader. He is section chief under the Reactor Systems Branch. Gary Mizuno, senior attorney from OGC. We felt it was important to involve the OGC throughout the process and not as an add-on at the end. Warren Lyon from the Reactor Systems Branch; Bob Tjader from the Tech Spec Branch; Bob Lata, senior operational engineer in the QA area; Kulin Desai, who is not here today, in Reactor Systems; Steve Jones from Plant Systems Branch to deal with the spent fuel pool issues; John Monninger from the Containment Systems Branch to deal with the containment issues; and last but certainly not least, Marie Pahida from the Reliability and Risk Analysis from the Probabilistic Safety Assessment Branch.

So I say about half of those people were dedicated to this activity and the other half were involved as needed to contribute so it is a broadly thought out rule approach.

CHAIRMAN JACKSON: Commissioner McGaffigan has a very deep comment I think he wishes to make.

7

COMMISSIONER McGAFFIGAN: I just have a question as to what happened after we got the comments? The Federal Register notice was October of '94. You got the comments in by March of '95, say. It was a difficult period, a long period. And then 21 months passed. What was the action-forcing event in January where you finally decided we better do something and what were -- what happened?

MR. HOLAHAN: Between the time that comments were received -- and, in fact, I think Tim will mention it is something like over a thousand comments were received, we actually went back and took the version of the rule that we had developed earlier and tried to accommodate those comments and to produce a new rule.

There had been some criticisms of the quality of the regulatory analysis. So there was a rewrite of the rule and a regulatory analysis. In effect, a second version of the rule was produced in that intervening period.

When we got rather late in that period, I think we decided I think rightly but perhaps much later than we should have, that we were not really on a success path, that taking the approach that we had used and trying to build in some additional flexibility, to try to patch up some of the original regulatory analysis, simply wasn't leading us to a success path and, in effect, it wasn't until we had seen a rather fully developed second version of the rule that we

8

thought that this is not really what the Commission and what the staff and what the industry would be comfortable with. We weren't -- I don't think it represented what I would consider our more modern thinking on risk-informed performance-based approaches.

So at that stage, we really decided to go back to ground zero and start over again and that is what has led us

to sort of a crash program over the last six months to produce what is, in effect, a third version of the rule.

Obviously, if we were starting over again, we would just build this version; we wouldn't have built either of the previous two. But I think the history of where we are and what we learned through sort of the middle '90s has contributed a lot to where we are now and we probably should have been smarter in the '94 time frame of sort of skipping over that middle phase. But things just didn't come together at that point.

CHAIRMAN JACKSON: Okay. Go on.

MR. HOLAHAN: Okay.

Tim, you take the --

MR. COLLINS: Okay. Could I have slide number 2, please?

The first thing I want to do is give you an outline of my presentation and give you a statement of our overall objective in putting together the proposed rule and

a little bit of history associated with it. Then I want to discuss what we perceive as the need for rulemaking, why we think there is this need. In that discussion, I will cover where we see weaknesses in the existing regulations and what we think the risk significance of those weaknesses is.

Then I will go through a structure of the proposed rule and try to describe how it remedies the weaknesses that we believe are present. I will also summarize the regulatory analysis results and then I have a slide which discusses how we have tried to use risk-informed principles in the development of this rule. We tried to make a very deliberate effort to use the risk-informed principles in the task force phase of the rule development.

I also have a slide which gives a summary of the changes to the rule relative to the 1994 version that was last published. And my last slide is a schedule of what we hope to accomplish in the next year with regard to final rulemaking.

Can I have slide number 3, please?

The objective of the proposed rule is to define requirements for cold shutdown, refueling and fuel storage pool operations that are risk informed, clear, coherent and enforceable. This is not to say that there aren't any regulations out there right now which covered different parts, different phases of this operation. But I think as

you will see, as the presentation goes on, there are some weaknesses and what we have tried to do is to fill in the important gaps in a risk-informed way.

CHAIRMAN JACKSON: Let me ask you this question, is the rule also performance-based or is it primarily risk informed?

MR. COLLINS: I would say it is primarily risk informed. It does have a performance element in, a specific performance monitoring element that we have included.

Slide number 4?

This slide discusses the background, some of which Gary has already touched on. As was mentioned, this is not the first time we have gone out for public comment on a proposed rule for shutdown operations. The previous rule was published in October of 1994 and it attracted quite a bit of interest from the public. We received over a thousand comments on the rule. Many of these focused on the regulatory analysis, inadequacies in the regulatory analysis.

The industry indicated that the rule was much too restrictive and that it would severely impact outages, in some cases up to as much as nine days' lengthening of outages. And the industry said that the rule was really unnecessary because of voluntary actions that the utilities have already put in place.

In the course of working on the resolution of those comments, the Commission's policy statement on PRA was also issued. That was in August of 1995. So between comment resolution and incorporating the philosophy of the PRA policy statement, that drove us toward the revision to the rule. And along the way we met with the ACRS for a status briefing. That was in May of 1996.

The ACRS wrote a letter following that meeting, indicating that they agreed there was a significant or important risk associated with shutdown operations. They thought that the rule that we proposed to them at that time would probably lessen risk. It was rather a lukewarm response in that regard. And they also suggested at that time that maybe we ought to consider a broader base lining of shutdown risks.

COMMISSIONER DIAZ: Excuse me, just out of curiosity and history of the 1,023 public comments, how many were in favor of the rule or how many were in disfavor of the rule?

MR. COLLINS: I think it was like 1,022 to 1.

COMMISSIONER DIAZ: That is what I was wondering. All right.

[Laughter.]

CHAIRMAN JACKSON: Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: What is your prediction

about public comments on the new rule if it goes out? Will it be 1,022 to 1 again? I mean, because -- what?

MR. COLLINS: I believe that this rule is far more flexible than the previous rule and clearly more risk informed so I would expect we may still get 1,022 to 1 but I think that we have addressed many of the comments in the previous --

MR. HOLAHAN: It's clear to me I have to send in more comments next time.

[Laughter.]

CHAIRMAN JACKSON: That's very good. Very good.

MR. COLLINS: During 1996, we also had meetings with NEI to try to understand industry's positions with regard to rulemaking and we understood the industry position to be that they didn't believe there was a need for rulemaking primarily because of the voluntary actions that were already in place or commitments that licensees had made. But they were willing to work toward the development of a performance-based rule.

Late in the summer of '96, the staff made a decision to expand the scope of the rule to include fuel storage pool operations and to consider external events. And following the staff decision, the interactions with NEI were terminated at that point. NEI felt that they couldn't support a rule which included fuel storage pool and external

events, is our understanding.

COMMISSIONER DIAZ: Why? What was the reason to include fuel storage at the time? Why did we include fuel storage with the low power and shutdown?

MR. COLLINS: Well, it was included with low power because the fundamental concern is heat removal. It is just more distant from the time of shutdown when you are in the fuel storage pool. So we thought that, rather than a separate rulemaking effort on fuel storage pool operations, we could just attach it to the shutdown rule since shutdown is primarily concerned with decay heat removal as well.

MR. HOLAHAN: I would say there were two things. One is the commonality of the technical issues. Many periods during the refueling, some of the fuel is in the vessel, some of it is in the spent fuel pool and so we are sort of a continuity of the treatment of the issues. The other was following the experience with Millstone and other plants it was clear that the staff and the licensees didn't have a common, clear understanding of what was expected of the licensees with respect to their requirements in the spent fuel pool area and we felt that something needed to be done to clarify what was required, not necessarily that there were more requirements but that there was sort of an unacceptable lack of clarity as to what was expected of licensees. And in last year's study on spent fuel pools,

there was a Commission meeting and a Commission paper. We had studied a number of plants, we had identified 10 followup areas and in addition we had said that something needed to be done generically to bring closure to the understanding of what was expected. So this is our mechanism for doing it, although it may have been done in some other way, this we thought was an efficient way to do that.

CHAIRMAN JACKSON: Because of the continuity of the issue?

MR. HOLAHAN: Yes.

CHAIRMAN JACKSON: I note that the ACRS had recommended a benchmark study on risk during low power and shutdown operations. How did this play into this rule or your schedule for it or how are you intending to address the ACRS comments?

MR. COLLINS: We read that letter very carefully and we had responded to the ACRS indicating that we were in agreement with many of their recommendations. That letter that they sent to us, the April letter, was not drafted in the context of the review of the shutdown rule. That was drafted in the context of the review of risk-based regulation as a whole.

You could read it to mean that well, maybe we ought to hold up shutdown rulemaking but it was not drafted

in response to a review of shutdown rulemaking.

CHAIRMAN JACKSON: And they plan, I understand, to comment on this proposed rule again?

MR. COLLINS: They asked to comment after the resolution of public comments.

CHAIRMAN JACKSON: Okay.

Mr. King?

MR. KING: Yes, we are proceeding to gather information and lay out our plans for doing these additional risk studies as suggested by ACRS. Currently, we would expect to begin those in about a year and there is a lot of information that has been developed since the previous risk studies that we did back in 1992 so both domestically and overseas and we want to build upon that.

CHAIRMAN JACKSON: Okay.

COMMISSIONER DIAZ: Just a comment. As you

progress in your presentation, I want to make sure that I get a very distinct idea of why do you think the spent fuel pools should be considered with the low power and the shutdown operations, where there is a tremendous difference in the configuration and lineup.

In one case, the reactor vessel is closed. You know, we can only access the reactor vessel through a series of very well set systems and mechanisms. In the other case, the reactor vessel head is not there, it is sitting on the

side and you have a fuel transfer canal and there are very, very, very distinctive issues.

We have decay heat all the time when we are at 100 percent power or whether we are at zero power. So decay heat is a common denominator for all operations in reactors and I think there is a very, to me, clear, distinct difference between low-power operation, shutdown and fuel storage pool and I hope they will actually --

CHAIRMAN JACKSON: Why don't we let them go on with their presentation?

COMMISSIONER DIAZ: For sure.

MR. COLLINS: Well, we already discussed the ACRS letter of April 18 and then in July of this year, we forwarded the rule to the Commission.

Slide number 5, please.

In the next few slides, I plan to address why we think there is a need for a rulemaking. The first step in assessing the need for rule was a qualitative assessment. We looked at the traditional safety functions that are associated with reactor operation and we looked at how these functions are protected by current requirements, both at power and during shutdown operations. I have listed on my slide the six functions we focused our study on.

When we reviewed the requirements at power, we found that such things that the general design criteria, the

technical specifications, Part 50, Appendix B, very comprehensively protect these functions. When we took the same look -- I'm going to slide number 6.

We took the same look at the protection provided by current regulations and tech specs during shutdown. We found that there were some issues which were not covered and I have some of these listed on slide number 6. The availability of such things as injection capability is not covered for PWRs during cold shutdown and refueling. That is, there are no technical specifications for ECCS in mode five and mode six.

COMMISSIONER DIAZ: This is specific technical specifications?

MR. COLLINS: Yes, technical specifications.

COMMISSIONER DIAZ: They are clearly covered by Appendix A and therefore by Appendix B.

MR. COLLINS: Yes, the ECCS systems.

COMMISSIONER DIAZ: Requirements during any normal conditions which includes, of course, the shutdown.

MR. COLLINS: The GDC certainly applied.

COMMISSIONER DIAZ: Okay.

MR. COLLINS: These are -- I have specifically listed this as availability to differentiate that from design requirements. Typically, availability is controlled by the technical specifications and we reviewed the standard

technical specifications to see whether or not these

functions were covered during shutdown.

CHAIRMAN JACKSON: So that is where the crux is, having to do with availability?

MR. COLLINS: It's availability. We don't have any concerns with the capability of the systems to perform their function if they are available.

CHAIRMAN JACKSON: So that is what brings them away from the general design criteria?

MR. COLLINS: Right, the general design criteria do not address availability.

CHAIRMAN JACKSON: Okay. And the only question I would ask is did you consider revisions to Appendix B or some other existing regulations? I guess it really has to do with your deciding it was better to treat all these issues in a comprehensive way as opposed to trying to go back and revise Appendix B?

MR. COLLINS: That's correct.

MR. HOLAHAN: In our previous versions of a proposed rule, for example, we proposed to have individual technical specifications to control the availability of equipment. But what we found is that normal operation is much simpler than shutdown activities. During normal operation, most all systems are available and perhaps only one at a time is taken out of service. And so it is

relatively straightforward to write requirements calling for all the equipment to be available and then giving outage times if one piece is.

A more complicated situation, I think, exists in shutdown when there are numerous pieces of equipment taken out of service and the combinations of those, I think, got too complicated or overly conservative in trying to write those into specific specifications.

COMMISSIONER DIAZ: I just was trying to get a nomenclature. I don't know whether I have to change but since I was a kid when I started in this business, you know, I don't want to say how long ago, but it was a long time ago, normal operations including shutdown and low power so you can't call shutdown, you know, a different type of normal operations.

MR. HOLAHAN: Yes.

COMMISSIONER DIAZ: Normal operations includes shutdown and that is part of normal operations and they are clearly addressed by Appendix B. It says operating conditions and all operating conditions are covered. So whether they are low power or shutdown, those are all normal operating conditions. So we cover them in different ways but now if we want to specifically address them in a better fashion, I understand that. But they have always been normal operating conditions, including shutdown.

MR. CALLAN: Commissioner, if I might add, the point that you are making is a point that OGC has made repeatedly in the discussions and during the pre-brief I had, OGC made that very point, that there are regulations that apply and your clarification is correct, that we are improving or enhancing our ability.

COMMISSIONER McGAFFIGAN: Could I follow up on that? One of the things you all do in this new rule, though, is somebody must see some vulnerability there because you add a definition in 50.2 of shutdown operation and the last sentence of which, shutdown operation is part of normal operations. So somebody felt constrained in this rulemaking package to make that crystal clear in regulation.

Is that because it may have been less than crystal clear previously?

CHAIRMAN JACKSON: We just wanted to be sure it was perfectly clear.

MR. HOLAHAN: Perfectly clear.

CHAIRMAN JACKSON: This just came out of OGC's comments.

COMMISSIONER DIAZ: If I may comment on that, I don't think there is anybody in the industry that has a question that shutdown is part of normal operation. If you want to add clarity for some additional purpose, that's fine. But the NRC and the industry, correct me if I am

wrong, we all call shutdown power normal operations, correct?

MR. CALLAN: Yes.

CHAIRMAN JACKSON: But I think the point is not so much to get hung up as to whether or not some existing regulations include shutdown operations within the scope. But if there are specific issues that you mentioned, availability number one, that this rule specifically allows us to deal with. And, secondly, a sentence that maybe states the obvious, if it really is obvious, and if it is not obvious, either way, it doesn't hurt to have it.

COMMISSIONER DIAZ: It doesn't hurt, but it is obvious.

CHAIRMAN JACKSON: This makes it obvious to all.

Okay, let's go on.

MR. COLLINS: Some other functions that we found were lacking in the current requirements, the availability of BWR venting. That is the ADS system we are referring to there. In BWRs, ECCS is required during cold shutdown. However, the ADS is not required and the ECCS required is low-pressure systems. And should you have a pressurization event, you wouldn't be able to use the ECCS anyway.

Containment is required under very limited conditions right now in the standard technical specifications. There are other areas where the current

requirements are what we would describe as maybe partial, they don't fully address some functions. Fire protection for cold shutdown equipment is an important area. 50.48, Appendix R and GDC-3 all treat fire protection. When we looked carefully at them, it was clear that they focused on a fire that started during power operations. It requires protection of equipment to a safe shutdown condition which has been interpreted as hot shutdown.

If you have a fire that starts at cold shutdown, that hot shutdown equipment would not be available. You typically need the reactor coolant system to be closed. If you are in refueling, the cooling system is not closed.

The only requirement for cold shutdown equipment in the existing regulations is that it be recoverable following a fire within 72 hours. Well, should a fire begin in cold shutdown, 72 hours is far too long to wait to recover that equipment.

There are other requirements with regard to fire protection that are tied to inerting. BWR Mark I and Mark II containments operate in an inerted condition when they are at power and, because of that, there has been a relaxation in the equipment protection requirements relative to fire. When you are shut down, these containments would not be inerted.

Finally, Appendix B, which addresses things like

procedures, corrective actions and QA, Appendix B applies to safety-related functions and the cold shutdown equipment is not always classified as safety-related equipment. Many plants, the cold shutdown equipment is not classified as safety related. So the applicability of Appendix B is kind of tenuous there.

COMMISSIONER DIAZ: I'm sorry, I have to argue with that.

Appendix B clearly says that QA will be commensurate with the degree of safety. So even if they are not in the Q list, now, you might be right they are not in the Q list, but they still have been QA to whatever degree or measure of safety is. So that doesn't mean they're not --

MR. CALLAN: Let me give you a specific example that I have been involved with over the years. At even newly licensed plants, the pressurized or the pneumatic seal that provides a pressure fit around the gate on a refueling canal is not -- frequently not captured by a licensee's QA program. When those seals fail, it causes a fairly dramatic drop in water level. It is failsafe, in a sense, that it won't go below a certain level that provides adequate protection but, nevertheless, it is a fairly dramatic event when it happens and results in a lot of water in the containment building during refueling outages.

That has happened a number of times around the country. Relatively recently, there has been I think at least two generic communications out on that. Just one example of a fairly important component that is not captured by an Appendix B program, it is not considered safety related. And I think there are arguments why it shouldn't be.

And there are several other examples of that nature.

COMMISSIONER DIAZ: Well, it was not because if it fails, it would have no consequences. It is just messy and transfers a lot of water --

MR. CALLAN: Right, but you do get elevated radiation levels depending on what's going on at the time and that sort of thing.

CHAIRMAN JACKSON: Mr. Holahan, you wanted to make a comment?

MR. HOLAHAN: Well, I think that although Appendix B could be read in some respect to apply to some of this equipment, that is not the standard interpretation used in the industry and since our objective was to reach some clear understanding as to what was expected, I think we want to be clear on how Appendix B ought to apply to such --

COMMISSIONER DIAZ: But we already have, you know, a guidance, I will say, in that we are going to go using

risk assessment and everything we have available to do graded QA and I am sure that that graded QA will eventually involve all of these systems. So we are ready to do actions in that respect.

MR. HOLAHAN: Yes. But I think where a licensee chooses to do the risk-informed graded QA, this would be taken care of. But we are approaching that as a voluntary program so if a licensee doesn't choose to do this, I think it would be different at that plant.

COMMISSIONER DIAZ: Thank you.

MR. COLLINS: All right, moving to slide number 7, please.

The second step of our analysis was to make a quantitative assessment of the significance of the weaknesses that we found in our qualitative assessment. And the first step we took in this was to try to make an estimate of risk of plants that are operating, in normal operation today. The way we did that was we took NUMARC 91.06, which is an industry-sponsored guidance document for shutdown operations management and we said, if we were implementing this guidance, what equipment would we make available during different phases of shutdown operation. And then we did a risk estimate based on the availability of that equipment.

That is the first line that you see on slide

number 7 where it says, estimate of industry practice. I just want to make it clear that this is not a number that the industry has provided to us, this is a number that we have estimated ourselves. You see that it comes up with numbers that are in the vicinity of the Commission's safety goal guidelines, quantitative guidelines.

Then the next step in our analysis was, what happens if we remove from that things which are voluntary, things which are not strictly required by the regulations, and we remove things that are not included in technical specifications, anything that was not specifically called out in the regulations, and we also removed commitments made in response to generic letters. So it is really a stripped down analysis.

If you took the tech spec requirements which were our minimum during these modes of operation and only what the strict regulations require, what happens then? And that gives us numbers which are well removed from the safety goal guidelines. Which was not surprising to us when you looked at the safety functions involved.

I think the primary message from this, this viewgraph here, is that the existing level of safety is very heavily dependent on voluntary measures. That is the message we got from this analysis.

CHAIRMAN JACKSON: What would the numbers look

like with the requirements of the rule?

MR. COLLINS: They come a lot closer to where the industry is right now. That is on a slide a couple slides down.

COMMISSIONER DIAZ: But again, let me see if I can try to understand these numbers. What you have, and let me see if I understand what numbers apply, the numbers will be different for, say, mid-loop operations in a BWR?

MR. HOLAHAN: Yes, yes.

COMMISSIONER DIAZ: Than they will be when we are refueling. So, in a certain way, the table, it is too much of an average and we conclude --

MR. COLLINS: These numbers are driven --

MR. HOLAHAN: It's not an average. It is an integral. It takes each of those situations but obviously the dominant contributor is just the mid-loop operations.

COMMISSIONER DIAZ: Right, it is an integral. And therefore, you know, it gives us a very, to me, I mean, I look at it, I almost fell out of my chair, look at it, flip-flop, had to be given salts and all of that.

[Laughter.]

COMMISSIONER DIAZ: As you know, it is a kind of very, very distinct difference. I think it is important to realize that, and that is what I was talking about, refueling operations and separating it from mid-loop in a

BWR, that these numbers probably only apply to a very narrow range of normal operations that were called mid-loop, going from mode five to mode six.

MR. COLLINS: To a degree, yes.

COMMISSIONER DIAZ: And that really, you know, it represents the risk in that area. While the risk, when the fuel transfer canal is open and everything is at atmospheric pressure, you know, a hose from the sanitary sewer can provide enough cooling, you know, if we get into extreme cases.

MR. COLLINS: Yes.

COMMISSIONER DIAZ: So I think it is important that we come out and separate them. And now, having said that, let me try to understand how we arrive at the, let's call it the first column, the mid-loop operations of BWRs and probability of core damage frequency of two to 10 to the minus two per reactor year. Is this the worst, worst, worst case scenario? Meaning, you have taken the fact that the system is sitting there and also you take the receivable heat removal system out completely?

MR. HOLAHAN: No.

COMMISSIONER DIAZ: No?

MR. COLLINS: No, we have used initiating event frequencies that are historical data or are best estimates at initiating event frequencies. What happens is mitigation

equipment is gone and --

COMMISSIONER DIAZ: So the receivable heat removal system is gone?

MR. COLLINS: No, not necessarily. Things like the CVCS would not be present, okay? The ECCS is not present. Containment does not affect the core damage frequency but it is not present either, okay?

And if you take a simple example, you have a loss of level control in a PWR, which is not infrequent from our perspective, and you don't have a makeup capability, you can't recover even if you have two-hour HR systems available, neither one of them can recover without first having some water makeup, okay? So something like a loss-of-level control event occurring during mid-loop, you can't recover from it. All you need is the initiating event frequency to get you these types of numbers.

CHAIRMAN JACKSON: Why don't we go on. We can't --

COMMISSIONER McGAFFIGAN: Could I ask just one question?

CHAIRMAN JACKSON: Sure.

COMMISSIONER McGAFFIGAN: NUMARC 91.06, is that mandatory within NEI framework for its members or is that voluntary? Was that a voluntary guideline?

MR. HOLAHAN: Yes, it met their definition of an

industry initiative which I think is comparable to mandatory within the NEI framework.

COMMISSIONER DIAZ: So that means that 80 percent --

MR. HOLAHAN: Exactly, yes.

COMMISSIONER DIAZ: Okay.

CHAIRMAN JACKSON: Okay.

MR. COLLINS: Moving on to slide number 8, this slide is an outline of the rule as we are proposing it. We are trying to address each of the weaknesses that we have identified in our analysis of current requirements.

The first element in the rule is a procedural element that would require administrative tech specs be added for all plants which would require that procedures in quality assurance, training and corrective action be included for activities that can affect decay heat removal, for safety function performance monitoring and for activities associated with maintaining mitigation capability available. This is basically to account for the potential Appendix B weakness.

The second element is the performance monitoring element that we made reference to earlier. Here, we have defined safety function limits associated with water temperature, reactor coolant system pressure and reactor coolant system level.

And we have defined limits. We have left it to the licensees to decide how they would monitor those parameters, what instrumentation they want to use, what frequency they want to monitor it. We would review the methods and criteria used for determining what instrumentation they were going to use and what frequency they were going to use. Should they violate any of the safety function limits, it would be a reportable event.

The third element in the rule is an administrative tech spec requirement relating to mitigation capability. We have written the rule in very high-level language. The rule itself says that the licensees must maintain equipment available to assure adequate core cooling and protection against the uncontrolled release of fission products. In this statement of considerations and the reg guide, we discussed that we expect that to mean backup RHR and injection capability and containment being intact, a definition of which we provide in the statement of considerations, or an alternative to the intact containment.

I think it is important to understand that in the containment alternative, we have made it clear that the containment provides a defense in depth function. It is a diverse type of protection. And that if a licensee chooses to use the alternate to containment, they need to recognize the defense in depth attribute that containment carries with

it and they can't simply put a second pump in place and say, well, I don't need a containment now. They have to be able to handle a wide range of initiating events just as containment would be able to handle it.

We also allow the licensee to choose whatever equipment they want to use. They must keep it, keep documentation in a licensee-controlled document, the document that will need to be identified in the tech specs for the purposes of inspection and enforcement. We don't want to have the requirements spread out in a bunch of different licensee documents. We have asked them to put it in one place so that an inspector can go and understand what is being relied upon at any given time in a shutdown.

We again would control the criteria and methods. We would review the criteria and methods used for the selection of equipment but the licensee would be free to change out different types of equipment at different points in the outage as long as they followed the methods and

criteria that were approved by the staff.

The fourth element of the rule is the fire protection element. I think the simplest way to think of this is that we have tried to bring the protection afforded at power operation into the cold shutdown regime. The rule would require that licensees either protect their cold shutdown equipment from the effects of fire or if they can't

do that, they need to provide suppression and detection equipment and to have contingency plans in place such that if both trains of cold shutdown should be lost by a fire that they can maintain core cooling by another mechanism.

CHAIRMAN JACKSON: Let me ask you a question.

How do you assess the inspectability and enforceability of the performance monitoring aspects?

MR. COLLINS: The inspectability, to a large extent, is very straightforward once we have approved the methods in the criteria because the licensee will have to document what instrumentation is being used, what frequency it is being used. An inspector can simply go to that document and say, show me that you have done this, and they can review the records over the past year or at any moment in time go in and say, show me.

CHAIRMAN JACKSON: So that is how you both have the inspectability and enforceability and consistency in inspection and enforcement?

MR. COLLINS: Yes. It does put some burden on the headquarters staff in that we will have to review the methods and criteria in advance. It should facilitate inspection and enforcement.

MR. HOLAHAN: And the office of enforcement has reviewed the package?

MR. COLLINS: Yes, they have.

CHAIRMAN JACKSON: Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: On the fire protection side, is there anything we are doing here that plays back into when and if we ever get around to doing Appendix R and getting rid of words like combustible and whatever, that have you protected yourself against having to come back and review this rule when we finally get around to doing that rule?

MR. COLLINS: Yes, we have worked with the Office of Research in the development of this rule and as far as we know, we are not doing anything contrary to what they plan to do and as a matter of fact, they plan to incorporate what we have done in shutdown into their own requirements as well as they see it fits. You know, they don't intend to redo shutdown.

MR. HOLAHAN: There were a number of discussions. I think it was recognized that fire protection for shutdown was not fully covered in the regulations and there were a number of discussions about how to address that. We could have just taken the 50.48 fire protection regulation and written shutdown into it or it could have been done here or it could be done in both. Through the discussions as to what looked like a reasonable way to do it and how that could be referenced in a future change to 50.48 results were sort of worked out before these words were developed.

CHAIRMAN JACKSON: Let's go on.

MR. COLLINS: Okay, the last element in the proposed rule is the one that addresses the fuel storage pool. The requirements here would be simply to update the

FSAR to incorporate the assumptions which are essential for the design and safety functions of the pool and to be sure that those assumptions were incorporated in the plant operating procedures.

I believe the thrust here is that there is the perception of misunderstanding of what the expectations were with regard to fuel storage pool operations, as evidenced by the problems we have had in the past few years. And risk studies didn't indicate a compelling reason to have a rule for fuel storage pool. We didn't do any quantitative assessment which says there is a heavy-duty risk here. But it is almost a matter of housekeeping to make it clear not only to the licensees but also to the NRC staff what is expected with regard to fuel storage pool operations and we see this as cleaning the slate and making it clear from here on out this is what is expected.

MR. HOLAHAN: I would say that, because of the decision we have come to, that in fact there are no technical requirements, there is no real backfitting of requirements here, this piece, this objective could be accommodated in other ways. The FSAR update rule could have

some specific language with respect to spent fuel pools or the Commission could just express to the industry that its expectation that 50.71(e) covers spent fuel pools but -- so I think it is written in such a way that it is not an essential element of this rule. That piece could be taken out and that issue could be dealt with separately.

CHAIRMAN JACKSON: But is it written in a way that is consistent with what is already going on vis-a-vis 50.71(e)?

MR. HOLAHAN: Well --

CHAIRMAN JACKSON: It's hard to say?

MR. HOLAHAN: It's hard to say because I am not sure exactly where we are going with 50.71(e). I think it is not very prescriptive at all. I think what it really says is whatever the current licensing basis is for spent fuel pools, write that into your FSAR. To the extent 50.71(e) is being pushed in that direction of saying get that sort of stuff in your FSAR, I think that is consistent.

CHAIRMAN JACKSON: Okay.

MR. COLLINS: There are a couple other conforming changes that go along with the rule which are not listed on the slide. Equipment which licensees wish to credit for the shutdown rule would need to be included in the maintenance rule program and for license renewal, any equipment which a licensee wishes to credit for shutdown rule would also need

to be covered in the license renewal.

Slide number 9.

Slide number 9 is the regulatory analysis results. We have already seen the first two lines, the estimate of industry practice and what is the base case in the regulatory analysis.

The bottom line is where we would be -- an estimate of where we would be if this rule was in place, okay? And, again, the rule basically raises the floor from several orders of magnitude away from the safety goal to right in the vicinity of the safety goal guidelines.

COMMISSIONER DIAZ: Subsidiary guidelines.

MR. COLLINS: Subsidiary guidelines, yes. Subsidiary objectives, sorry.

There is just one -- we have used the frequency of

unmitigated release as if it was a large early release. In fact, shutdown is slightly different because the short-term products would all be decayed away before you would get to a release in a shutdown accident. Typically it takes a couple days to get to cold shutdown.

CHAIRMAN JACKSON: Does the rule accommodate having NUMARC 91.06 being an acceptable methodology for meeting the requirements of the rule?

MR. HOLAHAN: Not directly, although I think the way the rule is structured, a licensee could propose the

program that they have under --

CHAIRMAN JACKSON: 91.06?

MR. HOLAHAN: NUMARC 91.06 as their approach and I think that could be reviewed and approved separately. I think 91.06 is not really a program, it is really a test of how good is your program. It is not really a definition itself. But I would think a program developed and consistent with 91.06 --

CHAIRMAN JACKSON: Would most likely meet the requirements of this rule?

MR. HOLAHAN: I think if you look at the risk numbers --

CHAIRMAN JACKSON: The risk numbers are very similar?

MR. HOLAHAN: Yes. I think what it would do is it would move that from a voluntary program into a more structured regulatory approach.

MR. COLLINS: Yes, NUMARC 91.06 is very high level. It is hard to answer the question directly, I mean depending on how you implemented it.

CHAIRMAN JACKSON: Okay.

MR. HOLAHAN: I think it is fair to say the same program and the same general use of equipment and its availability would apply to both cases.

CHAIRMAN JACKSON: Okay.

What do you mean by intact containment and does the reg guide include definitions of these kinds of less prescriptive areas?

MR. COLLINS: We include a definition of the intact containment. It allows certain penetrations to be open, provided that they can be closed automatically from the control room. It requires, though, that the closure be able to withstand full design pressure. We have given an explicit definition in the statement of considerations and in the reg.

MR. HOLAHAN: And correct me if I am wrong but I believe it calls for one barrier as opposed to two?

MR. COLLINS: Yes, one barrier, right.

CHAIRMAN JACKSON: Okay. Let's go on.

MR. COLLINS: Just one more comment, though, while we are on this slide. That is the ACRS letter talking about the need for a benchmarking study. If we look at the results and the insights to be gained from the studies we have done, I think it tells us that we really don't need to have a big, comprehensive benchmarking study of low power and shutdown to see that there is some weaknesses in our existing regulations and we can address those weaknesses very directly with the proposed rule we have.

The base case I don't think would change one iota, regardless of how much of a comprehensive benchmarking study

you have done. Once you take away important safety

functions, it becomes a very simple problem. And the rule case would be fine tuned. But we are talking about a thousand-to-one value impact ratio in this cost/benefit analysis. We can't see how the overall insight is going to be changed.

MR. HOLAHAN: The one area that might be somewhat different is I think that there hasn't been much research on core melt in an oxygen environment for a shut down reactor. I think in most cases, you know, we think of an at-power case and core melt in a superheated steam environment. So I think some of the chemistry and some of the release mechanism might be somewhat different and I think that deserves a comprehensive thought. In this case, I don't think it changes the answers but I think it would bring a better understanding of what sort of real risks are associated with these shutdown conditions.

MR. COLLINS: In addition to that, the way we have written the rule, you know, it requires things like adequate -- equipment for adequate core cooling and uncontrolled release of fission products, protection against that. We wouldn't necessarily need to have a rule change to implement insights from such a study and research anyway. They would be plant-specific implementation if it is found that certain equipment is particularly beneficial or certain

equipment is particularly vulnerable, those could be -- those insights could be incorporated without any change to the rule.

CHAIRMAN JACKSON: Okay.

MR. COLLINS: Slide number 10.

The regulatory analysis numbers do not include fire. We didn't believe that we had the capability to do a generic fire PRA for the purposes of the regulatory analysis. So, instead, we performed what I will describe as a qualitative risk assessment and I have listed five factors we believe are important in an assessment of risk from fire during shutdown operations.

What we did is we looked at how these factors are protected by regulations at power, how they are protected by regulations at shutdown and how the conditions associated with these risk factors are different during shutdown as opposed to power. Our objective was, let's try to bring the shutdown protection into the same regime as the power operation protection.

We found the first factor is frequency of fires during shutdown, there was an AEOD study. We used the data from that study that showed that the frequency of fires was rather high during shutdown, on the order of 10 to the minus two per reactor year. So initiating event frequency is relatively high, comparable to power operation.

All the other factors, we found that the conditions were either the same as at power or worse and the protection afforded by the regulation was the same or less.

COMMISSIONER DIAZ: Excuse me.

Could you be a little more specific? Fires where, in any --

MR. COLLINS: Oh, right. It was fires in areas that could affect the safe shutdown equipment or the cold shutdown equipment, I'm sorry. That's right.

For example, if you look at the probability of combustible loadings to allow fire to propagate, during shutdown that is the time when you've got a lot more welding

equipment on site, you are doing combustible fluid changes, you've got a lot of wood around to help with projects. It is just -- the conditions on all these factors were either the same or worse from a risk perspective, which led us to the conclusion that we could use some additional requirements to bring these, the protection, more up to the standard at current power operation.

Slide number 11.

This is where we have assessed what the cost to the industry would be from implementation of the rule. These costs are from today to the end of plant life. For the shutdown portion of the rule, we estimate it will be a little under $2 million per plant. These are primarily

paper costs. It is just a matter of bringing something which is currently in the voluntary regime into the regulatory arena just costs some money. We have included some costs for instrumentation upgrade which some plants could possibly need to do the performance monitoring portion of the rule.

The fire protection, again, it is a largely paper cost. There is some equipment, we have included a cost for some equipment which may be needed to enhance fire suppression and detection equipment for cold shutdown equipment.

A fuel storage pool operation is strictly a paper exercise and it is about $50,000 a plant to update the FSAR and modify procedures so the total cost for the entire rule we would estimate to be less than $3 million per plant for the lifetime of the plant.

CHAIRMAN JACKSON: Is this above and beyond what the licensees may already be doing to update their FSARs? So this is kind of as if they have done nothing to this point?

MR. HOLAHAN: Yes, I think that's correct.

COMMISSIONER DIAZ: Have you had some feedback on this number from industry? Has anybody said it's low?

MR. COLLINS: No, they haven't seen these numbers. They have not seen these numbers.

CHAIRMAN JACKSON: That is what the new comment period will do.

Yes?

COMMISSIONER McGAFFIGAN: Could I ask, are these numbers front loaded? I mean, if you use paper exercise, in the year after the rule goes into effect would most of this cost be incurred?

MR. COLLINS: Yes, it would. Yes.

MR. HOLAHAN: In some cases, all of it is just a one-time cost.

MR. CALLAN: Just anticipating some comments from the industry, there is a hidden cost here that is not reflected and that is, I guess, what you could call the regulatory impact or the regulatory cost. Now that what was voluntary is now enforceable, that means that from time to time, probably every outage, there will be issues that will be raised by the inspection staff that will have to be dealt with and at no small cost in some cases in terms of staff time and paper. So there is that expense that is not reflected here that would be ongoing.

CHAIRMAN JACKSON: Okay.

MR. COLLINS: Slide number 12.

Slide number 12 discusses how we tried to take into account the risk-informed principles in the development

of the rule. There was a very deliberate effort to use risk

insights throughout the development of the rule. We used PRA technology where we thought we had the capability. We did the quantitative assessment for the shutdown portion. We didn't think we had the capability to do a meaningful, generic fire PRA and for the spent fuel pool there was no need to do a PRA at all. There were some previous studies which showed that the risk of fuel damage was very low to start with.

We tried to maintain defense in depth philosophy in dealing with containment. Obviously, the containment can't always be closed during refueling operations. However, we didn't want to give up totally on defense in depth so we wrote into the rule that the defense in depth attribute had to be considered when a containment alternate was being used. In the analysis, we tried not to use any DBA assumptions at all. We tried to be as realistic using information that was available to us in all our analyses.

Treatment of uncertainties, we did a qualitative assessment of the uncertainties. We used point estimates for all the risk values and when we looked at the value impact ratio being a thousand to one, we concluded that a detailed uncertainty analysis is very unlikely to make any changes to that conclusion so we didn't do anything further after we did our qualitative assessment.

Finally, the safety goal subsidiary objectives

were used throughout. We used that to assess where the current regulations put us, where the new regulations would put us and where we thought the industry was today.

CHAIRMAN JACKSON: Okay.

MR. COLLINS: Slide number 13 is a summary of what has changed since the rule last went out for public comment in 1994. The hot shutdown and low power modes are no longer within the scope of the rule.

We did a more rigorous regulatory analysis where we broke out the early phases in hot shutdown and low power, looked at the regulatory requirements applicable to them and concluded that, in fact, the safety functions were pretty well protected by existing requirements. So we withdrew hot shutdown and low power from the scope of the rule.

The previous rule also had a requirement for the containment closure was always required, containment closure capability. In this rule, we try to be more flexible by allowing alternatives to containment, provided that the defense in depth consideration was maintained.

The previous rule also made broad use of the single failure criterion. It was very reminiscent of traditional design basis accident analysis type approach and we have tried to use risk insights to limit the scope of the single failure criterion and basically it now is a requirement for a backup RHR.

The licensee is allowed to set performance monitoring limits in this rule. We simply define safety function limits related to water temperature, level and pressure. The licensee is free to decide how they want to monitor those. If they want to correlate some other parameter to those particular parameters, they are free to do that provided that we have approved the methods and criteria they are using.

The fuel storage pool was not addressed in the

previous version of the rule at all and the regulatory analysis which supports this rule, we think, is much more rigorous than supported the 1994 rule. In summary, we think that it is much more flexible and risk informed than the 1994 version.

Slide 14 is the schedule that we are hoping to accomplish for rule implementation. We would love to have Commission approval by the end of the month to go out for public comment.

CHAIRMAN JACKSON: We will work on that.

MR. COLLINS: Given that, it will take us a few days to get the rule actually published.

CHAIRMAN JACKSON: I've got the fast commissioner over here anyway. It shouldn't be a problem on that side.

MR. COLLINS: We have allowed a 75-day comment period which traditionally manages to get extended to 90

days so we have shown 90 days on the schedule. We plan to meet with the ACRS then in next April following resolution of public comments and we would have to go back to CRGR again. We would anticipate doing that in May and then bringing the final rule to the Commission in August of next year.

CHAIRMAN JACKSON: Okay. Any further comments or questions?

Commissioner?

COMMISSIONER DIAZ: Should the other commissioner go first?

CHAIRMAN JACKSON: No, you're the senior commissioner.

COMMISSIONER DIAZ: Let's see if I can organize a couple of comments in here.

First, I think it is very important that the staff focus attention in an area where I think we have been working up and down and I think that has been going on for years. I think it is important that we realize where are the risks and that follows the philosophy that the present Commission is emphasizing in the area of risk assessment.

I do want to have something clear. That is that I believe that the fuel storage pool does not belong in this role. I think that that is an issue --

CHAIRMAN JACKSON: That is going to be something

that the Commission will have to decide since it is in the paper.

COMMISSIONER DIAZ: That's correct. That's it absolutely. And the Commission will look at it.

But I think we are mixing apples and grenades and I don't think we should do that.

In the area of the overall -- in the rest of the rule, I think we need to give a little bit more consideration, or I will give consideration to the fact that we have been trying to be less prescriptive, trying to work in developing, you know, an environment in which things are done because they are right and this might be going the wrong way, although it might be necessary. I think we need to put those two objectives and bring them together. There is a long history now of we, the NRC, and the industry providing licensees with requirements that make the plants work better. Those requirements that you have not taken into consideration, I understand the base for it, actually have made nuclear power plants safer through a long history of time now and, of course, we really never have a "accident" or release during shutdown. That is a major

issue.

We actually have been allowing the industry to determine which systems are operable or must remain operable during certain conditions and which they can actually remove

50

from service. So we have actually been making allowance in determining can you take this system out, can you do in-service inspection. Essentially, this rule comes in and restricts that area significantly as a rule rather than as a voluntary process or as a process that might be really required through other means which could be generate letters and so forth.

I just want to bring up one major thing that the NRC did many years ago, which is called ALARA, and which has served this Commission and this Commission has used for many years in assuring that we have minimal impact due to -- you know, from radiation to personnel, the public and the environment and that has worked well. So I believe that we should take these things into consideration as we go into the rulemaking.

But I want to thank the staff for a wonderful job.

CHAIRMAN JACKSON: I want to thank you for outlining your vote.

[Laughter.]

CHAIRMAN JACKSON: Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: I am actually going to ask a question.

I would comment that your earlier answer to the Chairman's question about where does this fall in prescriptive versus performance-based space, I actually

51

reading the rule find it quite far towards performance based and there are things that you have done since the last time in terms of alternatives to containment and it is very broad language. The licensee shall minimize the frequency of fires during shutdown operations. I mean, you are not telling them how to do it, you are telling them they shall do it and there may be some prescription in the reg guide but in looking at that continuum, I think they have made a larger step than perhaps the answer indicated towards performance-based rule.

That is in response to Commissioner Diaz. Now, let me ask my questions.

One thing I noticed in the package that I haven't seen earlier in previous rulemaking packages is this Table 7 safety goal decision guidance that apparently comes from the safety goal and it -- does this come up in other rulemakings, just as a matter -- I am just interested whether you do this matrix every time you propose a rule in reactor space?

MR. HOLAHAN: This, the regulatory analysis guideline, core damage frequency, additional containment failure probability?

COMMISSIONER McGAFFIGAN: Right.

MR. HOLAHAN: That is a screening criteria that is used for all -- actually for all generic issue screening,

52

both for generic letters as well as for things like rulemaking, and it is built into the regulatory analysis guidelines. It is a screening step to identify which are issues that ought to move forward and then a risk analysis with a, you know, cost/benefit analysis done sort of as a second stage, so what Tim was showing was the second stage

results.

COMMISSIONER McGAFFIGAN: So I should look forward to seeing this in every -- in almost every package that comes forward?

MR. HOLAHAN: Usually, you don't see that particular piece but that is the screening level. Usually, you see the second level results.

MR. KING: Yes, right.

That piece goes to CRGR when they review rules. It doesn't always show up in the statement of considerations.

COMMISSIONER McGAFFIGAN: Right.

MR. HOLAHAN: But it has always been considered at some stage in the process.

COMMISSIONER McGAFFIGAN: And then we have been exploring through the afternoon some of the interactions between this rule and other rules. There is a separate package up to us at the moment on the famous maintenance rule, Section A(3) and Alternative 3 that is offered in that

package is something that would not just change the "should" to "shall" --

MR. HOLAHAN: Right.

COMMISSIONER McGAFFIGAN: -- but address other issues and it doesn't sound unreasonable if we are going to move in the direction of risk-informed regulation that says that one of the advantages would be to provide a foundation on which other risk-informed regulation could build. But among the disadvantages, it says such a rule would have broad impact on other current and proposed rules including the proposed shutdown rule and should thus be part of a separate rulemaking that would be used for risk-informed regulation in general.

Can you explain that, what the impact of the possible Alternative 3 for the shutdown rule would be?

MR. HOLAHAN: Well, I think there is clearly an interrelationship. I am not sure I would describe it entirely as negative. From what Tim has said, you can see the most important aspects of this rule have to do with controlling the availability of equipment that is used to mitigate events and to the extent that the maintenance rule, the A(3) part of the maintenance rule also addresses availability of equipment, I think a strong A(3) which addressed both power operation and shutdown I think could accomplish that same function as the shutdown rule.

Now, I think the implications are in order to do that as part of the maintenance rule, you would have to build some infrastructure in the sense of, well, how would you use A(3), what sort of analysis would be done, does it require that there would be a PRA that was reviewed and approved? There are a lot of ancillary questions that we are not quite ready to answer.

But I think that functionally there is this overlap in terms of control of the availability of equipment. Likewise, I think technical specifications control the availability of equipment and so there would be a considerable overlap between an A(3) and the current technical specifications. So I think it is a powerful thought but it has a lot of implications to be sorted out.

CHAIRMAN JACKSON: Thank you.

MR. HOLAHAN: Thank you.

MR. CALLAN: Chairman, I would like to just make one comment at the end.

You know, a common theme in this presentation is the Staff's view that there is a problem with our regulations that needs to be addressed and that the safety net that our regulations provide for shutdown operations is not sufficient. That is the baseline. What the staff is not saying is there is a compelling need in terms of licensing performance for a rulemaking. You know, my view,

and somewhat anecdotally, is that the performance of the industry is actually better than the NUMARC 91.06 guidelines. I mean, the region I just left, I would say at least half of the licensees in that region have something equivalent to a shutdown risk meter concept with a very sophisticated war room during outages where risk is tracked almost hour by hour, without exaggerating. As equipment is taken out of commission, the range of options are reviewed and adjustments are made daily. Quite sophisticated control of risks during outages.

So in terms of licensee performance, there isn't a compelling argument. But none of that -- I shouldn't say none of that -- very little of that falls within the regulatory framework and that is the issue here.

MR. HOLAHAN: Absolutely. I agree. And one of the things we have done in these last six months is recognized that I think in the past we were in danger of writing a rule that would have been at odds with even the better licensee programs. It would have required them to keep some set of books on technical specifications and maybe even distract them from their risk management approach. So I think what we have constructed here is a rule which could, in effect, adopt and bless a program that Mr. Callan has described. They wouldn't necessarily have to change that program. It would simply draw it through the reference from

an administrative technical specification. It would become the licensee's commitment to continue to carry out that program. I think that is a way of taking advantage of the best features of an existing program.

CHAIRMAN JACKSON: Yes.

COMMISSIONER DIAZ: Are you convinced that none of our requirements, even if they are old, have captured this or have we actually forgotten to use them? Because, you know, there are some that actually I could pick out from the book that might address this and not very long ago we actually put out a new one.

CHAIRMAN JACKSON: Okay, let him answer.

COMMISSIONER DIAZ: I was still talking. I wasn't finished.

So, you know, when you look at it, okay, and you look at what we just did with PRA and you look at some of the things, my question always goes back to the definition that we use in the book of any normal operating condition and it might have been captured. I just want to be sure it was not captured someplace else.

MR. HOLAHAN: Okay.

What I am convinced of is the Atomic Energy Act covers shutdown operations. So the Agency has the power to regulate it. There are other areas where the regulation either suggests or could be interpreted to cover shutdown

but it is not clear and it is certainly not the current staff and industry practice to interpret the regulation that way. So part of what we would be doing here is, remember,

the original objective is to become clearer on what the requirements are.

COMMISSIONER DIAZ: All right, thank you.

CHAIRMAN JACKSON: I would like to thank the staff for a very informative briefing today and it is clear from the quality of the briefing that you and the rest of the staff that have been associated with this project have spent many long hours of thought and consideration on this. And as the overall safety and reliability of nuclear power reactors does generally continue to improve but pressures to improve economic performance continue, it is imperative as you have outlined here that if, where necessary to ensure protection of public health and safety and that operating and safety margins are maintained, that we promulgate regulations that are as risk informed and performance based as they can be.

I think it is interesting, coming out of this discussion, for the staff to review as it is involved in resolving either other generic issues or other rulemakings, to review the extent to which voluntary licensee action is relied upon and where, if regulatory action is warranted, that it is not something that takes the licensee -- takes us

away from where that can satisfy what our needs are.

If there is nothing more, we are adjourned.

[Whereupon, at 3:18 p.m., the briefing was concluded.]