UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
***
BRIEFING ON ELECTRIC GRID RELIABILITY
***
PUBLIC MEETING
***

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland
Wednesday, April 23, 1997

The Commission met in open session, pursuant to notice, at 1:30 p.m., Shirley A. Jackson, Chairman, presiding.

COMMISSIONERS PRESENT:

SHIRLEY A. JACKSON, Chairman of the Commission
KENNETH C. ROGERS, Commissioner
GRETA J. DICUS, Commissioner
NILS J. DIAZ, Commissioner
EDWARD McGAFFIGAN, JR., Commissioner

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

JOHN C. HOYLE, Secretary
KAREN CYR, General Counsel
DAVID MEYER, Electricity Team Leader, Office of Policy & International Affairs, Department of Energy
DENNIS EYRE, Executive Director, Western Systems Coordinating Council
ERLE NYE, President and Chief Executive, Texas Utilities Company
JOSEPH CALLAN, EDO
ASHOK THADANI, Associate Director for Inspection and Technical Assessment, NRR
RONALDO JENKINS, Electrical Engineering Branch, NRR
MARY WEGNER, Reactor Systems Engineer, AEOD
DENWOOD ROSS, Director, AEOD
ROBERT WOLFF, Chief Executive, New England Power Pool
MICHEHL GENT, President, North American Electric Reliability Council
JOSE DELGADO, Director of Electric System Operations, Wisconsin Electric Company

P R O C E E D I N G S

[1:30 p.m.]

CHAIRMAN JACKSON: Good afternoon, ladies and gentlemen, this meeting is the first of two Commission meetings dealing with electric utility deregulation and related issues. This first meeting will focus on electric grid reliability and how it may be impacted by electric utility restructuring -- deregulation and restructuring.

The second meeting will address deregulation issues in general with representatives from several federal

agencies involved.

The Commission will hear presentations today from both the NRC staff and invited industry representatives, along with a representative from the Department of Energy, I'm told.

Specifically at this first meeting, the Office for the Analysis and Evaluation of Operational Data, or AEOD, will present information from its study of grid performance factors. The study was initiated to collect operating experience where grid disturbances had an impact on nuclear power plants and other background information on grid performance.

Last year, two electrical disturbances within a five-week period on the western grid caused 190 plants to trip off line, including several nuclear units.

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These events occurred after AEOD had released its draft report -- after it had released its draft report concluding that the grids are basically stable.

A stable and reliable grid was an assumption in the NRC's report on unresolved safety issue A-44, the evaluation of station blackout accidents at nuclear power plants dated June 1988.

The reliability of off-site power is important to nuclear safety since accident sequences initiated by loss of off-site power are important contributors to risk for many nuclear plants.

The Office of Nuclear Reactor Regulation also will address licensing requirements for electric power systems, station blackout, and potential safety concerns with recent grid events.

The Commission understands that grid reliability is a voluntary function under the North American Electric Reliability Council and the regional councils, and that federal oversight is currently located at the Federal Energy Regulatory Commission and at the Department of Energy.

DOE has created a working advisory committee on the reliability of the U.S. electric system, which is considering whether efforts to date to maintain reliability are sufficient to provide assurance of reliability in the future and whether there may be a need for increased federal

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authority over reliability in the future.

NRC, we understand, has been coordinating with DOE and will continue to keep abreast of this effort. This is a long introduction.

Following the NRC staff presentation, industry representatives chosen to represent several different geographical areas and grids will discuss the strengths and vulnerabilities of their grids.

Additionally, a representative from the DOE will describe the department's current activities regarding electric grid reliability.

And so the Commission is interested in a number of things and I'll tell you a few.

First, insight on what effects electric utility deregulation will have on grid reliability as far as we understand, a discussion of the independent system operator concept, and an assessment of what governments or operational specifications need to be built into the ISO process to ensure a stable grid.

I personally have discussed the issue of electric grid reliability with numerous utility executives over the past year. It was not possible to invite to the panel today

all of the industry representatives who have been active on this issue, so I apologize to you in advance. But if there is, toward the end of the meeting time, I may invite other
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utility or state representatives to offer any additional brief comments they would have to the Commission as appropriate.

I understand that copies of the various -- the presentation, at least the staff's, is available at the entrance to the meeting, and so unless there are any further comments, Mr. Callan, please proceed.

MR. CALLAN: Thank you, Chairman, and good afternoon, commissioners. WITH me at the table are Dr. Denwood Ross, the director of AEOD, and to his right, Mary Wegner, who is a reactor systems specialist who works for Dr. Ross in AEOD. To my left is Ashok Thadani, who is an associate director in the Office of Nuclear Reactor Regulation, and to his left is Ronaldo Jenkins, an electrical engineer who works for Mr. Thadani.

Chairman, you've covered all the points I was going to make in my preamble, so I will at this point turn the discussion over to Dr. Ross who will begin the presentation.

DR. ROSS: If we go to slide 2, the reliability of the grid to which the nuclear plant is connected can affect the safe operation of the plant. And because of several events on grids around the country, AEOD performed a study which is the basis for the first part of this Commission briefing and Mary Wegner is the author of that study.
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The study identified several grid performance factors, such as demand growth, capacity margin, and plant age, which she will talk about. And on the basis of this study, AEOD developed a recommendation that all licensees should confirm and maintain their licensing basis with respect to stability.

Mary will discuss her study in more detail, and then following that, NRR will discuss the original licensing basis concept and NRR's plans for addressing grid reliability. Mr. Jenkins will provide the NRR comments, along with Mr. Thadani.

Slide 3.

CHAIRMAN JACKSON: And before you go, in terms of the recommendation from this study for licensees to confirm and maintain their licensing basis, I think the memo you sent also states that several licensees reviewed their grid analyses. Was this voluntary on their part?

DR. ROSS: Yes. In fact, Mary will have the specific discussion on that point. Sometimes it was in response to an event, such as the Virgil summer event prompted a Virgil summer reconsideration, but I think we'll discuss that in more detail in the middle of her presentation. But I'm not aware of any regulatory requirement that dictated or required reexamination of it.

Now, it is true that this concept is embedded in
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their 5054 letters that went out last year with respect to licensing basis in general, of which this is just a part.

CHAIRMAN JACKSON: Now, are you going to talk about agency actions that are generic -- any generic agency actions that came about as a result of the summer event you mentioned at the summer plant?

DR. ROSS: I don't think we were.

MS. WEGNER: The only action I know of was the issuance of an information notice and that led to another utility doing --

DR. ROSS: But I don't believe there are a specific licensing action if that's the question.

CHAIRMAN JACKSON: Okay. Even though at the time, the FSAR stated for that plant that the grid should be able to absorb the loss of a generating unit, but in that particular case, it couldn't and 16 other units tripped off line. You didn't feel that any --

DR. ROSS: Let me check.

MR. THADANI: I think my understanding also is that, as you say, an information notice was issued as a result. Any other actions we may have taken, I don't know of, but we can check on that.

DR. ROSS: Slide 3. Certainly, reliable power is needed for safety equipment, and we see this at several places in the Commission's regulations.

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For example, GDC-17 has the notion or the idea that an off-site electric power system shall be provided to permit functioning of structure systems and components important to safety.

It has a number of statements and provisions relative to off-site power as well as on-site power.

Further, GDC-35 states that for ECCS, system safety function must be accomplished using the off-site electrical power system assuming the on-site power system is not available, and conversely, and also, assuming a single failure.

And other rules have links to off-site power. For example, 10 CFR 50.63, loss of all AC, has requirements linked to the expected frequency and loss of off-site power and duration of the loss.

Risk assessments also considered a loss of off-site power, and if in the modeling you also lose the on-site power from the emergency diesels, you would be in a condition referred to as station blackout, or SBO.

This event in many risk assessments is the dominant contributor to core damage frequency.

At present, the contribution of grid reliability to loss of station power is relatively small and it's more likely the origin of loss of station power would be within the station, sometimes called plant centered, such as a

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circuit breaker or transformer faults, or weather related, such as winter ice storms, strong winds, possibly an earthquake, and Hurricane Andrew is a good example of a weather-related loss of station power.

And from this you can see that adequate safety is based on a combination of both, on site and off-site power. And while at present, grid reliability is not a dominant contributor to the risk factor such as core damage frequency, it seemed important to us to provide assurance that this would continue to be the case in the future consistent with the licensing basis.

What I want to do now is turn over a discussion of the grid performance factor study to Mary Wegner.

CHAIRMAN JACKSON: Let me just ask you a couple questions before you do.

Do we have confidence that the assumptions supporting the station blackout rule remain valid in light of some of the more recent data? And what would be the significance if such events -- the loss of off-site power

were more frequent that what had been assumed at the time?

DR. ROSS: From what we've seen -- we don't have a published study -- that the frequency, especially related to grid stability and loss of station power, is less.

Now, I'd say the definitive study is in a NUREG-1032 which is good up to 1985. It's a 20-year study from, I

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think, 1966 through '85, and it counts the number of events and categorizes them into the three bins that I mentioned, which is grid centered, plant centered, and weather, severe weather.

We are in the process of updating that study, so we will have a new Sub 1 or Rev 1 to 1032. Actually, it will have a different number.

There was about, I think, 12 grid stability events at the time of that study, but most of them were in the Florida Peninsula area and it was a hardware alignment situation which was corrected and there's been essentially no subsequent grid centered -- or grid stability problems because of the way they rearranged their interties.

So from what we can tell, the data would support a lower frequency of occurrence.

Now, what we would have to do is put in the duration, which is part of the blackout rule also.

The other half of your question would deal with the reliability of on-site facilities. AEOD just finished a publication on that study, almost all the diesels in all the plants, and it showed in general that the reliability is tracking about what it was assumed to be, and there is a statistical spread. And I think we have made this available to the Commission.

We don't have any information now that would put

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50.63 in a new and different light, but we are working on it.

CHAIRMAN JACKSON: Do we require a certain reliability of on-site power sources that is referenced to assumptions about the grid?

MR. THADANI: In most cases, as a result of the station blackout rule requirements, licensees came in and make certain commitments about reliability of on-site AC power source. In this case, it might be diesel generators. So we do have licensee commitments on site, AC power source reliability.

If I may just add to it --

CHAIRMAN JACKSON: I guess what I'm -- let me just ask you this. Are they referenced to assumptions about the duration --

MR. THADANI: Yes.

CHAIRMAN JACKSON: -- and the extent of the loss?

MR. THADANI: In fact, I was going to touch on that. That's exactly the issue, is the station blackout rule, the real controlling factors are not just the frequencies themselves, loss of off-site power, but also duration.

Duration is a very critical issue, and in many cases, the resolution on a plant-specific basis was that they could cope with station blackout for a certain time

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period. In most cases, it was on the order of four hours, because the expectation was that off-site power could be recovered during that time period.

And there are a number of -- as you noted in your

introduction, that this rule went into effect in 1988, and a number of issues have developed in the intervening years.

Dr. Ross mentioned the IPEs are showing station blackout to be still a dominant contributor, and in some cases it's quite significant still.

And there have been some new issues that have developed over the last eight or nine years, one of which has to do with the behavior of reactor pump seals, and their performance could be significantly degraded in the absence of cooling to the pump seals.

What we're doing in the Office of Nuclear Reactor Regulation is we are collecting and looking at all the new information, grid reliability being one of the issues. We are collecting all the information and we're planning to reassess the whole issue of station blackout, integrating all this new knowledge that we have now, and would expect to complete that evaluation by the end of 1998.

That was going to be Mr. Ronaldo Jenkins' -- part of his presentation, so excuse me for having -- I think it's important to recognize that we're trying to integrate all these issues and reevaluate station --

CHAIRMAN JACKSON: So we'll wait.

DR. ROSS: I think many of the commitments are found in the companion reg guide to the blackout rule, which is -- Mary.

MS. WEGNER: Slide 4, please.

In 1989, an event occurred at the Virgil summer nuclear plant that resulted in a major grid disturbance. AEOD began an inquiry to identify other grid-related events that impacted the operations of nuclear plants, naturally the availability of off-site power.

It was necessary to learn about the grid in order to evaluate the findings of the study and to communicate them. My presentation is divided into three parts. First I will address the organization of the North American Electric Reliability Council and some important characteristics of the grid.

Secondly, I will describe some events involving grid perturbations or the potential for a grid instability.

Finally, I will close with the conclusions I have drawn.

Slide 5, please. The North American Electric Reliability Council was formed in 1968. Its mission is to promote the reliability of the electricity supply for North America. It is made up of ten regional councils and one affiliate council. The local utility is connected to other

utilities in its reliability council and to other reliability councils which form the North American Electric Reliability Council.

The entire Continental United States, most of Canada, and part of Mexico are interconnected in order to provide reliable electric power to consumers.

Membership in the regional councils is voluntary and is open to all individual electric systems from all ownership segments of the electricity supply industry.

This map shows the location of each reliability council. The acronym and the names of the councils are listed in the study.

In 1997, adherence to the North American Electric Reliability Council standards was made mandatory. Each reliability council has a set of operating criteria that were based upon the North American Electric Reliability

Council criteria, but modified to allow for regional differences.

The operation of each reliability council is not uniform, that is, the Mid-Atlantic Area Council operates as a single entity, while the Southeastern Reliability Council is composed of four subregions which are virtually autonomous.

Slide 6, please.

CHAIRMAN JACKSON: When you said that the

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adherence to the operational requirements was made mandatory, made mandatory by whom?

MS. WEGNER: The board of trustees of the North American Electric Reliability Council, and I believe the members have completed their voting on the acceptance of it. But Mr. Gent could answer more detailed questions on that than I could.

CHAIRMAN JACKSON: Mr.?

MS. WEGNER: Gent of the North American Electric Reliability Council.

COMMISSIONER ROGERS: Just before we go on, does every electric generator or generator of electricity for sale belong to an electric reliability council?

MS. WEGNER: I would say probably not since it's a voluntary organization, but I would say most of them do, if they wanted to be interconnected to other utilities to provide their electricity to others and to receive aid from them when they need more additional power. There's nothing requiring them to be.

MR. JENKINS: Independent power producers would not fall under this. This was mainly for utilities.

MS. WEGNER: Well, they can. It's voluntary.

CHAIRMAN JACKSON: So membership is voluntary?

MS. WEGNER: Yes.

CHAIRMAN JACKSON: But decisions are binding on

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the members, provided the members accept them?

MS. WEGNER: I presume. Mr. Gent can answer the question more adequately, that there are business contracts written up to enforce these decisions.

CHAIRMAN JACKSON: Okay.

MS. WEGNER: Peak demand and capacity margin projections are important grid parameters. On this chart, the peak demand projections for the Mid-Atlantic Area Council, our council, are shown in the upper left-hand graph. The lower left-hand graph shows the peak demand projections for the New England Region of the Northeast Power Coordinating Council.

All reliability councils project a yearly increase in peak demand over the next ten years from about 1 percent to about 2 percent per year.

Capacity margin is a planner's tool to deal with unexpectedly high demand, demand forecast error, and so forth. Capacity margin projections for the Mid-Atlantic Area Council are shown in the upper right-hand graph. Capacity margins for the New England Council -- the New England region of the Northeast Power Coordinating Council are shown in the lower right-hand graph.

System response to a developing situation is affected in part by the availability of unloaded generation. Unloaded generation is related to capacity margin. A

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continuing decrease in capacity margin will eventually

impact system response.

Slide 7, please. Power plants are aging. The plants that are expected to produce the electricity needed during the 1997-2005 period have already been built. The chart shows the total numbers of plants started up and their total capacity by decades. Both the number of plants coming on line and their capacity declined sharply after the 1970s.

40 percent of the electricity is generated by plants which may be 26 years old or older. According to the East Central Area Reliability Coordination Agreement, ECAR, the aging of generating capacity necessitates the increased maintenance and lengthened outages.

The Virgil Summer 1989 events report named the age of nearby plants as a contributing factor. Age has the potential to become a factor in grid reliability.

Slide 8, please. I have talked about the organization of the North American Electric Reliability Council and some characteristics of the grid. Now I will address some operational aspects of the grid as demonstrated during events.

There are two kinds of grid emergencies. The first is the outcome of excess demand. That is, demand above expected peak demand that may exceed reserves. As this kind of emergency develops, there is usually time for

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human intervention to mitigate the transient.

The second emergency type develops very rapidly as a result of a fault. Automatic systems protection must cope with the situation.

The third type of situation is a discovery of the potential for grid instability due to an existing nuclear plant condition.

Slide 9, please.

CHAIRMAN JACKSON: I'm looking at the fault issue with the summer event, and particularly the western grid disturbance of last year, and I recall that your draft report at that time concluded reliability just weeks before this western grid disturbance --

MS. WEGNER: Yes.

CHAIRMAN JACKSON: -- on August 10th.

Now, had that report specifically looked at the potential of the kind of fault that caused those two events, that caused the western grid disturbance?

MS. WEGNER: There were previous faults, the July 2nd one, the December 14th, 1994 in which a seemingly innocuous situation occurred far across the country from the nuclear plants and caused a disturbance, and I looked at it to the point in which I determined to the best of my ability what transpired during these events and wrote them up in technical review reports, and they were summarized in the

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report.

That is, I believe, as far as I could say that we have reviewed the events, but --

CHAIRMAN JACKSON: I guess I'm really more interested not so much in ringing your bell relative to that particular event, but more to understand is whether the way we track the status of the grid was such or is now such that we would be sensitive to the potential for the kind of event that occurred last summer.

DR. ROSS: Other than expose what happened in the reports, I'm not sure of any specific action --

CHAIRMAN JACKSON: I guess I'm saying, what do you measure to make a conclusion that a grid is stable and

reliable? What do you measure? What do you look at? How do you reach that conclusion?

DR. ROSS: Okay, I understand your question now. The specific event, and I think Mary's going to get bottled -- segmented the western area to a number of little ad hoc islands, and within the islands, certain actions took place.

And if the plant -- some of them tripped, most of them tripped, some did not -- it was such that you still have reliable off-site power to the plant, even though the plant may trip, then I think that's relevant.

CHAIRMAN JACKSON: I guess I'm wondering, are we sensitive to whether there may be operational conditions

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that are occurring, or do we know enough even about the maintenance of the grid to know whether the loading -- or whatever factors, to know when a potentially problematic situation is developing?

MS. WEGNER: That, I believe, would be DOE's Office of Emergency Management's job.

CHAIRMAN JACKSON: Okay. And I guess this goes back again to something we had talked about in an earlier stage, and the issue becomes then the interface.

If DOE's Office of Emergency Management -- and we're going to hear from them -- tracks certain things, what communication is there then to us that we fold into in any kind of a trending database that would trigger us to be more sensitive or transmit information to the regions, to have our folks be more sensitive to the potential for some --

MS. WEGNER: DOE has been sending me weekly reports, which I've been transmitting to a number of people in DOE and NRR, discussing a potential situation in a few weeks in areas where there may be problems or where there have been problems.

Don't know about any databases other than the study --

CHAIRMAN JACKSON: But nothing that would allow any response on a real-time basis or anything that approaches that?

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MR. CALLAN: Chairman, I think in all candor, I'm speaking as an ex-regional administrator, the insights the region gets regarding grid reliability they get from industry sources, typically through the resident inspectors who are -- attend several operational meetings every day that the licensee holds at site.

But we don't have a mechanism, a reliable mechanism internally to disseminate that kind of information.

DR. ROSS: And I think also to the point we talked about, the sudden, rather than the slow drop in capacity. There's some inner workings amongst the councils about how to, given a trauma of some sort, to separate into islands, and we don't review that. We don't have access or --

CHAIRMAN JACKSON: You have the issue of sudden disturbances.

DR. ROSS: Yeah.

CHAIRMAN JACKSON: And then you have the issue of degraded voltage, right?

DR. ROSS: Right.

CHAIRMAN JACKSON: And I noted that your report, and I'm going to quote from it in discussing a particular plant that had a degraded voltage event stated, that "the degraded voltage analysis accepted by the NRC in 1979 was

not updated because no requirement for periodic update
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existed."

And so what's the status with respect to that? Do licensees adequately monitor degraded voltage concerns, if the licensee's data is updated with respect to that when they perform their IPEs or their PRAs now?

And I guess my -- I'm told that degraded voltage weaknesses were routinely identified when we did these electrical system SSFIs some years ago. What staff actions came out of those and do we have any current concerns?

DR. ROSS: Let me answer the first part and I'll turn to Mr. Thadani for the second part. We don't know the extent to which utilities have updated their stability, hence our recommendation. We just don't know.

As far as what came out of the SSFIs, I'll ask Mr. Thadani to answer, but I'll expect we're into the plant centered rather than the grid centered area now.

MR. THADANI: Yes. By and large, the findings were more on plant-centered issues and there were follow-on activities as a result of that. But two parts. Let me go back to this point to a question you raised.

IPEs are -- at least it's my view that they do not look at degraded conditions. They look at failures, actual experiential database, and that's how they come up with frequencies of events.

In addition to that, Mr. Jenkins will be talking
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about an effort that we're initiating at Oak Ridge National Laboratory, and one element of that is going to be -- focus attention on the issue you raised just now.

CHAIRMAN JACKSON: I keep coming to Mr. Jenkins.

DR. ROSS: He's the last speaker so we're all --

CHAIRMAN JACKSON: I will try to be good for the next three minutes.

MS. WEGNER: Slide 9, please.

The first example is an event in which weather-driven excess demand affected grid operations locally. The event occurred on January 18th through 20th, 1994. Cold weather affected most of the Midwest, south, northeast, and Mid-Atlantic areas of the United States. The figure shows the relationship of temperature at the Washington National Airport to electricity demand for the region.

On the 18th in the Mid-Atlantic area, the temperature began to drop from 35 degrees Fahrenheit at 5 a.m. to 8 degrees Fahrenheit at midnight. In the evening, electricity demand increased inversely with the temperature when it was expected to drop with the change in usage from commercial to residential.

Weather conditions not only increased customer load, but also disrupted fuel supplies. Generation was increased to the maximum. Transmission lines were loaded to their maximum.
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Slide 10, please. Emergency measures for reducing the load as shown on slide 10 were instituted. The Mid-Atlantic Area Council and Virginia Power had to resort to rotating blackouts to maintain the reliability of the grid. Florida, New York and Canada provided power to the Mid-Atlantic. Load reduction measures as shown in slide 10 were instituted and utilities, government entities, the business community, and the private sector all cooperated to reduce load.

The system frequency never decreased to the point

where step 8, actuation of automatic underfrequency load shedding relays occurred.

The second kind of emergency, a fault driven transient, occurred in 1989 at the Virgil Summer Nuclear Plant. At Virgil Summer, a loss of cooling signal was generated, the turbine tripped, and the reactors scrammed. Nearby plants attempted to make up the load but tripped because their generator protection was set high because of their age.

A cascading failure resulted during which 16 units tripped off line and caused a severely depressed voltage throughout South Carolina and the neighboring states.

Virgil Summer's 20 buses saw the degraded grid condition and isolated from the grid. The emergency diesel generators started and loaded the running buses. They ran

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for one hour and 35 minutes. Subsequently, the licensee determined that his grid analyses had to be periodically updated.

Slide 11, please. Another important event was the western grid disturbance of August 10, 1996. The weather in Los Angeles was hot. Relatively inexpensive hydropower was available from the northwest. Large amounts of power were flowing southward when voltage problems in the northwest became evident.

A line sagged into a tree at Oregon. Lines tripped; generating plants tripped. The system separated into four islands as shown on the slide outlined in heavy black lines.

Frequency in the Northern California island dropped. All five sets of load shedding relays actuated causing about 50 percent of Northern California load to be shed.

Many power plants tripped, including Diablo Canyon units 1 and 2-- units 1 and 2. Southern California, Arizona and New Mexico were part of the southern island. Frequency dropped there also, triggering load shedding.

Palo Verde units 1 and 3 in the southern island tripped. Neither nuclear site lost all off-site power as a result of the event. A transient resulted in the loss of over 30,000 megawatts of load, 25,000 megawatts of

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generation, and the tripping of 190 generating units shown in dots on the slide, which came from the western grid disturbance report of WSCC.

Included in those dots are the Diablo Canyon units in California and the Palo Verde units in Arizona. The Western Systems Coordinating Council concluded that the system operation was not in compliance with WSCC minimum operating criteria prior to the beginning of the transient.

That criteria requires that the system be operated so that cascading failures which can cause system collapse do not occur. Cascading failures did occur. However, the structure of the system and the responses of the operators controlled the situation to prevent grid collapse and equipment damage, allowing rapid recovery.

Besides events, several potential grid instabilities based on licensees' analyses have been reported. For example, the licensees for Point Beach units 1 and 2 in Kewaunee have identified scenarios involving transmission line outages with the potential to cause loss of all off-site power to Kewaunee.

Slide 12, please. My conclusions are these. On

the whole, the grid is stable and reliable, even in the face of events as serious as the August 10 disturbance. However, problems described in the study, including decreased capacity margin, plant aging, reanalyses which have

identified problems, actual events, and uncertainties introduced by restructuring of the electric industry, indicate the need to monitor grid conditions on a regular basis.

And that's the end of my presentation.

COMMISSIONER DIAZ: Are you sure on the Palo Verde trip?

MS. WEGNER: I'm sorry, sir.

COMMISSIONER DIAZ: Are you sure that Palo Verde tripped?

MS. WEGNER: Palo Verde units 1 and 3 tripped.

MR. CALLAN: Let me clarify that. There's a distinction here that's important. Palo Verde can withstand a loss of load without a reactor trip and, in fact, I was regional administrator at the time. My recollection is that the unit withstood the loss of load transient turbine trip without a reactor trip.

MS. WEGNER: The reactors trip on a low TNBR.

COMMISSIONER DIAZ: But only one was actually -- information was only 2 and 3 you're talking about.

MS. WEGNER: Units 1 and 3 tripped from 100 percent power.

COMMISSIONER McGAFFIGAN: 2 didn't?

MS. WEGNER: 2 did not. It's because of -- I presume, and it looks like it's because of the direction of

power flow out of the plant.

COMMISSIONER DIAZ: But unit 1 was not on line. Unit 1 was --

MS. WEGNER: Unit 1 was in 100 percent power, and unit 3. Unit 1, I believe, just came out of an outage.

COMMISSIONER DIAZ: Mr. Callan, would you like to figure that out, please?

MR. CALLAN: I don't recall exactly the units that were up or and down, Commissioner, but we'll get back to you on that. I've forgotten.

CHAIRMAN JACKSON: There's an AEOD recommendation?

DR. ROSS: Let's go to slide 13. We had a single recommendation from the study. NRR, which is our usual receiving office -- well, sometimes it's NMSS, but we requested -- NRR should request licensees to confirm that they continue to meet their licensing bases with respect to stability and reliability, and further, have a process for ensuring they meet this licensing basis on stability for the rest of their license.

CHAIRMAN JACKSON: That's a natural segue into NRR's part of the presentation.

Mr. Callan.

DR. ROSS: Now I believe it's Mr. Jenkins.

COMMISSIONER DIAZ: I think I'm actually very proud of it. I guess the SONGS unit, SONGS 2 and 3 did stay

on line.

MS. WEGNER: They did stay on line, yes.

CHAIRMAN JACKSON: We have Mr. Ray here.

MR. JENKINS: Good afternoon, I would like to briefly discuss first the licensing basis for reliable power to safety systems and components, and then those NRR actions which we believe are appropriate in light of the ongoing

changes in the electric power industry.

Slide 14, please. General design criteria 17 details the electric power requirements for nuclear power plants. The on-site and the off-site power supplies together assure reliable power for safety-related functions.

Each power type, independent of each other, have different characteristics. The on-site power source must meet the scene-of-failure criteria. As a minimum, the off-site power source consists of two independent circuits. Each must be capable of safely shutting down the reactor.

In addition, GDC-17 also states that provisions must be included to minimize the loss of off-site power.

As part of the staff's review of the licensee's design, grid stability analysis which were performed by the licensee must verify that the local grid remains stable in the event that the nuclear unit generator is lost or the largest other generating unit is lost, or the loss of the most critical transmission line occurs.

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With that short overview of the licensing perspective from off-site power, the next slide describes our ongoing or near-term actions.

CHAIRMAN JACKSON: Let me just ask you two questions. The Virgil Summer event of 1989, tell me where that stood with respect to any of these three factors.

MR. JENKINS: The Virgil Summer event reflected the fact that they had not updated their grid analysis and taken the appropriate action with respect to ensuring that the loss of that particular unit would create a local grid disturbance.

So technically they were not consistent with that, but the problem is that that's not a hard requirement. At the time plants are licensed, the staff looked at the grid analysis and basically verified that, in fact, that had been done.

But over the course of time, and this showed up in the ANO event, or the licensee event, the disconnect between the transmission departments and the nuclear generating units sort of led to a disconnect between them. But the ANO event which was led by the fact that they were going to have an ESFI inspection forced them to look at their grid analysis, and then of course they reported it.

CHAIRMAN JACKSON: So have all of our licensees systematically verified?

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MR. JENKINS: I could not state that. The -- at one time, if it's stated in their SCR that they performed a grid analysis, they did do that, but over time, conditions change. There's no requirement at this point.

MR. THADANI: Let me comment. When we issue information notices, we're not explicitly calling for licensees to do specific analyses that they need to report back to us, but there is an expectation that they need to go back. Given the information in that notice, they need to assess the information and its applicability to the requirements that they need to meet.

So there is that expectation. When we find information in one plant that could potentially be applicable to other plants, we issue the information notice that those plants will in fact look at the information notice, make a conscious decision whether there is information there that may be applicable to their plant and their requirements that they need to go back and verify it.

DR. ROSS: Chairman Jackson, a typical FSAR statement will be the stability of off-site power systems is in compliance with the branch technical position. That's an NRC branch, concerning stability, and that they have -- steady state and transient studies show that the loss of both units, which happens to be south Texas, or the loss of one unit with the other unit either on line or off line

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would not impair the ability of the system to supply power to the ESM electrical system.

Then it goes on and talks about stability. That's a typical SFAR commitment.

CHAIRMAN JACKSON: So given that, there's no specific requirement that if some event like this western interconnect situation occurs, that they have to go back and assess what's in their FSAR against what has occurred? Is that what you're telling me?

MR. JENKINS: They would have to look as part of -- being a member of the reliability council --

CHAIRMAN JACKSON: No. I'm talking about in terms of us.

MR. JENKINS: From our perspective, there's no requirement that they would have to do any grid analysis.

DR. ROSS: I do note that the --

CHAIRMAN JACKSON: What is -- go ahead.

DR. ROSS: The FSAR is written in the present tense.

CHAIRMAN JACKSON: So you're saying that to say what, Mr. Ross?

DR. ROSS: To me, that means whatever is true then is true now. It didn't say at a certain point in time, I could do this. It says it is.

MR. JENKINS: Certainly it would be actionable on

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our part if we determined that there was deficiencies. They would have to go and correct those deficiencies, either the FSAR, or they would have to correct the plant in response to the grid.

CHAIRMAN JACKSON: Commissioner Diaz.

COMMISSIONER DIAZ: I'm trying to understand the role of the house power or the -- you know, our -- the reactor and, you know, the power plant running.

If I remember correctly, when TMI happened, we actually required that whole power plants will trip -- I mean all the reactors will trip when the turbine trips, that's correct, and then at the same time, those power plants that had an integrated control system and had actually bought a power run-back were authorized to disconnect the power run-back.

And how many plants are affected like that? How many plants actually had a power run-back option that would allow them to trip and then restart and pick up 10 percent of the load? Do we have an idea?

DR. ROSS: Let me comment a little bit on that because at that time, the BMW plant had a -- well, of course it still does -- had a pilot-operated relief valve, and on a typical load separation where the primary pressure is going up, the PORV would be electrically commanded to open first, and then if the pressure kept on going higher, the reactor's

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trip signal would be generated. This was built in so that the ICS could run by power before they tripped on high pressure.

One of the more immediate things that happened

after TMI was an emergency bulletin that reversed these set points such that you got the trip first, and then the PRV was challenged next.

That really more or less invalidated the run-back feature of BMW.

COMMISSIONER DIAZ: It also affected the Westinghouse plants that don't have the problem with the power grid relief valve, will have an integrated control system; is that correct?

DR. ROSS: I'm not sure about that, but the feature did come into mind on one of the European plants that had a precursor PRV stuck open years before, so I think that was true, that the valve opened first and stuck open.

The whole idea of reversing it was to quit challenging the PORV.

MR. THADANI: That was also the pressure trips at a point were modified for reactor trip versus opening of the PORV. That was all.

COMMISSIONER DIAZ: I was trying to determine whether the power plant -- you know, the turbine trips, there's an overload, the actual trips, and then we get into

a situation in an hour or two, you know, how we access the capability of the nuclear power plants to come up and pick up the house load itself and I've seen that missing from the analysis.

MR. JENKINS: As I understand it, there's no provision for picking up house loads once the plant trips.

CHAIRMAN JACKSON: I want to go back and try to close the loop here between what your statement -- your statement about FSARs being written in the present tense and your statement that there's no specific requirement in the -- if there is some major grid disturbance relative to what's in the license -- related to the licensee, is to go back and assess their grid stability analyses relative to these factors that are laid out here.

And I don't understand. I mean, what are you trying to tell us, they do or they don't -- that they are or they are not required to update their analysis?

MR. JENKINS: I think we're saying the same thing, which is that apparently a licensee has an FSAR and that indicates that it includes not only a licensing basis but the design basis, and if they find a condition which -- that's no longer true, then they're going to either have to adjust one or the other, and --

CHAIRMAN JACKSON: Right. But I guess I'm trying to get at this issue of, they find that something is no

longer true. The issue is, what triggers that judgment?

MR. JENKINS: Discovery either by the staff or the licensee.

CHAIRMAN JACKSON: Okay. So then if something happens like the WSCC events, okay, and/or the Virgil Summer event of '89 and/or the ANO event, is that a discovery that triggers a need for reanalysis?

MR. JENKINS: The western grid disturbance, given its regional nature, will not necessarily force licensees to look at their particular control area and say that we need to reanalyze.

In other words, the central problem, as Mary discussed with the western grid disturbance, was the fact that some parties were not meeting their minimum operability reliability criteria which was established by the council,

and the corrective actions would have to work through that voluntary organization.

If the WSCC found that there was a problem with that -- with a particular control area and it centered on that plant, then that would be something that the licensee or the utility would have to address.

But none of the conclusions I saw were that specific.

DR. ROSS: Chairman Jackson, what I meant by the present tense is that when NRR proceeds, like they said, on

their third bullet to implement this recommendation, they certainly, when they communicate, this say this is not a new requirement; remember, your plant was licensed that way.

So it's not like we're reinventing something. It just we're saying, are you still doing what you said you would do 15 or 20 years ago?

COMMISSIONER ROGERS: Well, I'm troubled by the whole way this thing is being discussed because it seems to me that our responsibilities and our licensees' responsibilities are between the two of us, and now we're talking about a grid that's out there, and it seems to me that what we have a responsibility for is to see that the licensee can function safely in the event that something happens on the grid but we can't control that grid.

And so we're talking about -- you know, we keep talking about grid stability considerations as if we can control the grid through some licensing action of our own, and to me that -- you know, that's never-never land. We don't do that.

And so there's an analysis that says -- I mean the statement here, the analysis must verify that the grid remains stable in the event of these sorts of things, that's a presumption that the licensee makes in developing their coping requirements, I'll call them, and how they handle those sorts of things.

But that's not a requirement on the grid because the grid's out there and it's whatever it is. And so, you know, I think that the issue which we've been ducking here, I think, is that things are changing or could change out in that grid that are different from the way the historical record will show. That's what we're concerned about.

And what are the implications of that with respect to our requirements on our licensees?

CHAIRMAN JACKSON: Exactly. That's all I'm trying to get you to say. Thank you. Thank you.

COMMISSIONER ROGERS: We can talk until the cows come home about what the reliability councils have to do. We don't control the reliability councils.

MR. JENKINS: If we can go to slide 15, please. Okay, and slide 15, this is a part of the ongoing actions, future actions that we plan to take in light of these changes in the industry.

First, we plan to monitor industry developments. We met with utilities, Commonwealth Edison, government authorities, such as FERC and DOE, and also with the North American Electric Reliability Council. I would say that this particular matter is a new area for the staff to enter into before we consider the grid reliable.

We still consider the grid reliable and stable based on the evidence that we have, however, we are trying

to look ahead and identify if there are any problems

approaching on the horizon.

The next bullet, we're proceeding in securing a contractor to assess the risk significance due to potential grid instability as a result of deregulation, and this will address some of the points that you are mentioning.

We can't control the -- what's happening in Iowa as how it affects a plant at Palo Verde, but we can assess whether or not changes in the industry require us to take additional actions to compensate for any grid instability.

As recommended by the AEOD report, we plan to issue a generic communication to licensees to reemphasize to them the need to maintain their design basis with respect to off-site power requirements.

There is no change here. The equipment has to have adequate voltage and frequency in order to operate, and the preferred source is the off-site power system.

Lastly, as part of the PRA implementation plan, we plan to reassess the risk from the SBO perspective. Overall, we are taking a look at this brand-new world as it develops, and I think in the past, the line for us was the capacity to switch. Some of the grid stability considerations on the previous slide dealt with when a plant was initially licensed and we were concerned with the local grid operation. But that was all assuming that the grid was

reliable and stable.

COMMISSIONER ROGERS: It's out there. Whatever it was was not going to change.

MR. JENKINS: Right.

COMMISSIONER ROGERS: And that in the event of any of these three things on -- these challenges on slide 14, that the plant could handle that.

MR. JENKINS: Right.

COMMISSIONER ROGERS: See, we're using the term stability and reliability. We're coupling the two together, and I wonder whether there's a distinction between them or if there is no distinction between them, then we ought to use one term, not two. But I suggest that there might be a distinction between them in that it seems to me that when we're talking about stability, we really are talking about certain deterministic considerations, and when we're talking about reliability, we may be talking about more probabilistic considerations out in the grid someplace, whereas the stability analyses tend to be related to very specific types of events which could then be handled through a deterministic fix of some sort.

So I don't know what your thinking on this is, but I would suggest that in the interest of clarity, either we use one term, reliability, and not two, unless we really do want to draw a distinction between stability and reliability

and how they affect licensees and how we think about the grid, in which case we have to be, I think, clearer than we are right now.

CHAIRMAN JACKSON: Dr. Thadani, you want to comment?

MR. THADANI: I just want to say, I completely agree with your comments and we do want to draw a distinction and just as you described it. So we'll make a point of making --

CHAIRMAN JACKSON: So there are two terms.

MR. THADANI: Two issues, yes, and we'll make sure that we characterize them properly.

COMMISSIONER DIAZ: I just wanted to make sure that when Mr. Jenkins was talking about the brand-new world, are you talking about daylight time or nighttime?

MR. JENKINS: We have to find out exactly which it will turn out to be.

COMMISSIONER ROGERS: Which time zone?

CHAIRMAN JACKSON: Well, I guess my only question has to do with the following: why is it going to take until the end of 1998 to do these things? And if we're going to utilize contractor expertise, have we placed a contract?

MR. JENKINS: We're in the process of placing a contract.

MR. THADANI: Mr. Jenkins, he was down at Oak

Ridge about two weeks ago.

MR. JENKINS: We wanted to assess the capabilities of the contractor, and that was part of the delay in order to have a good fit between our -- what we're interested in what they can provide.

CHAIRMAN JACKSON: Well --

MR. THADANI: If I may.

CHAIRMAN JACKSON: Please.

MR. THADANI: There are a number of issues that we're trying to make sure we take into consideration. I mentioned reactor coolant pump seal issue. Some of the inspections have identified concerns about the so-called alternate AC power source at some plants, Millstone in particular, there were the problems there; questions about availability of the alternate AC source if there is delayed loss of on-site power.

That is, if you don't have simultaneous loss of off-site and on-site AC power, it could be, the way the station blackout rule is written, it could be that an hour later, and that's what happened at Millstone, an hour later, because the battery charger has gone from the alternate AC power source, but that alternate AC power source may not be available.

There are a number of issues. We're trying to make sure. The whole idea of trying to go to Oak Ridge and

trying to get additional information on this issue, the potential impacts in terms of grid reliability, it would be very difficult for us to move an issue at a time, particularly if we're in the realm of backfits. We need to be able to integrate, understand what the risk significance is, and be able to support whatever actions we want to take.

CHAIRMAN JACKSON: Of course we have to support whatever actions we want to take. Of course we have to worry about backfit. Of course we have to do the cost-benefit analysis. Nonetheless, the train is leaving the station.

And the issue, to me, they're twofold, there are two pieces. One has to do with, as Commissioner Rogers says, all we can control is what we can control. Nonetheless, we're a public health and safety agency. If we know that there's a larger issue out there, even if it's in the realm that we don't control, but the industry is organizing itself, and it's not that they're not thinking about it themselves, relative to certain kinds of requirements, whether some agency needs to have some ability to enforce certain things, et cetera, we might be asked to speak to it.

We need to be in a position to speak to it in a time frame that is timely relative to what's going on. And

that's why I'm asking the question about why is it taking us
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two years to get to this when there could be legislation or there could be actions that go on this year that relate to these kinds of things. So that's number one.

And number two, again, we're here, you know, going around the barn more generally on issues having to do with licensees maintaining their current licensing bases, and we have things in the FSAR that relate to assumptions or analyses about, you know, grid stability and, you know, in terms of coping capabilities in plants, and the Commission is being asked and in the process of making decisions, you know, with respect to that, and the issue again of being able to inform that process in a way that makes sense.

And so again, we can't just kind of lull along because we say, well, you know, that's DOE's Office of Emergency Management, we've got to get this contracting, we're going to take two years to do our thing, when the train's leaving the station.

And that's all I'm really trying to say. We don't do what we don't have the regulatory authority to do. And we don't want to overstep the bounds, but at the same time, if there's an issue, we need to clearly identify it, identify it in a timely way, and even if it's not in our regulatory purview, if there's a public health and safety issue, we have to be prepared to speak to it.

And that's what -- I mean, I think you have to
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develop a little bit more of a sense of urgency with respect to this.

Is that the end of your presentation?

MR. THADANI: Yes.

CHAIRMAN JACKSON: All right, we'll hear from the next panel. Thank you.

Well, gentlemen, I want to thank you for coming and I think -- I'm assuming that -- who's the lead of the discussion here? The gentleman from DOE, Mr. Meyer.

Okay, so why don't you give us the organization of your discussion.

MR. MEYER: Good afternoon, and thank you for the opportunity to present the Department of Energy's views on matters related to the reliability of the Nation's fault electric system.

I am David H. Meyer, electricity team leader in the Office of Policy and International Affairs at the department.

The department strongly supports the restructuring that is now occurring in the electric industry because we believe that it can lead to reduced electric costs and enable consumers to choose among a wider range of energy products and services.

However, the transition to competition will require changes in the institutional infrastructure that has
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been developed over the past several decades for maintaining grid reliability.

We believe that competition and reliability can be compatible, but we also believe that that result will not be achieved automatically.

Ensuring continued reliability must be set as a design requirement and taken into account as a critically important policy objective by the legislators, regulators, industry executives, and others who are presently concerned

with the overall architecture of the new electric industry.

I'm pleased to say that in my personal opinion, this concern has been generally accepted as a critical design requirement and that in one fashion or another, strong mechanisms for preserving reliability will be built into the new industry.

That, however, I have to add immediately that there may be some bumps in the road before we get the design set exactly right.

Let me turn to the department's current activities related to reliability, and there are several activities that come under this heading.

The first, and perhaps the most important to you in today's context, is reliability as it relates to the proposed federal legislation, that is, not DOE's own ideas or views on the legislation, but more generally by others.

The department believes that the existing legal framework for the industry is out of date and needs to be modified to be relevant to a competitive industry.

Legislation is needed that will resolve jurisdictional ambiguities, eliminate obstacles in federal law to competition, and provide policy guidance and direction on a wide range of issues raised by the prospect of competition.

We have developed some concepts and draft materials for such legislation as a basis for interagency discussions, and we hope that these discussions will lead in due course to a legislative proposal that the President will recommend to the Congress.

CHAIRMAN JACKSON: Now, do you have this working on a particular track where you developed a specific interagency process and have it tracked to a recommendation or set of recommendations to the President by a proposed date?

MR. MEYER: Our proposal is in a -- has gone into an interagency review process. That's not a process that we can control, so we are not able to give you any particular date.

CHAIRMAN JACKSON: And the NRC is part of that?

MR. MEYER: I am not sure who is and who is not in on that process.

CHAIRMAN JACKSON: Is the NRC part of that? Can anybody speak to that?

MS. CYR: People on my staff have been meeting with a group of people at least from DOE on issues on restructuring legislation. I don't know if it's a different set than this, but --

CHAIRMAN JACKSON: You do suggest that there's an actual document that's undergoing interagency review?

MR. MEYER: The interagency review process was put on hold pending Secretary Pena's confirmation.

Now, Betsy Moler has been nominated as deputy and my personal expectation is that she will want to take a very active role in that process, so it may be that that process will be delayed yet further to allow her to be in place and then take an active role.

CHAIRMAN JACKSON: So let me make sure I understand. There is or is not a draft document that's undergoing interagency review?

MR. MEYER: There's a draft document that awaits an active interagency process.

Reliability is one area that we think needs to be

addressed in this legislative debate. The existing infrastructure for maintaining reliability has been developed on an as-needed basis by the industry and has little or no explicit basis in federal law.

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Legislation may be needed to express an explicit federal interest in reliability and provide support to the industry concerning the setting of reliability standards, operation of the bulk electric systems, monitoring of compliance with the standards, and enforcement of the standards when necessary.

I will return to this subject in more detail in another section below.

Let me speak very briefly to the task force on electric system reliability that the Secretary of Energy, Hazel O'Leary established last year.

This is a subcommittee of the Secretary of Energy's Advisory Board and the task force is chartered to address technical, institutional, and policy issues pertaining to reliability. It is chaired by former Congressman Phillip Sharp, now of Harvard.

We were pleased that a member of the Commission's staff attended the task force's March meeting, and I suggest that the Commission consider writing to Mr. Sharp to express its principal concerns in the reliability area so that he and the other members of the task force can take your views into account as they do their work.

CHAIRMAN JACKSON: Now, we may indeed do that, but I also would ask that you make -- take the NRC's concern on this issue to the task force.

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MR. MEYER: Yes, yes. We would welcome more frequent dialogue with you and others as appropriate here to -- so that we have a very clear appreciation for your concerns.

We have federal reporting requirements for major system incidents. That is, that the department, in order to meet its national security requirements and responsibilities contained in the federal response plan, has established mandatory reporting requirements for electric power system incidents or possible incidents.

These incidents are to be reported to the department through its Emergency Operations Center and the type of incidents to be reported on include load shedding actions or loss of firm loads, system voltage reductions, public appeals for short-term reductions in electricity usage, acts of actual or suspected physical sabotage or terrorism, add fuel supply emergencies.

CHAIRMAN JACKSON: Have you been actually trending this data? How recently has this reporting started?

MR. MEYER: That reporting requirement has been in place for quite some time. We are in the process of preparing a new summary which we will distribute to all transmission owning and operating entities.

The plan is that that would be distributed under a cover letter signed by the Secretary and we wish to -- the

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thought is that this would demonstrate the Secretary's keen interest in reliability issues.

Once an incident is reported to the department, the department then alerts other agencies as appropriate and works with them to develop a coordinated response to the problem, if a response is needed.

Let me speak briefly about our participation in disturbance reviews. That is, when significant outages or other disturbances occur, the industry examines the data pertaining to the disturbance in minute detail in order to learn as much as possible from the incident about its causes and how similar incidents might be prevented.

Last summer, as one of the 24 recommendations in our report to the President on the western outage of July 2nd and 3rd, the department determined that henceforth, it would participate in the reviews of all major system disturbances, and our reasons for participating in these reviews are to demonstrate our continuing commitment to maintaining reliability and to learn, along with the industry, all that we can about the causes and preventability of such incidents.

Finally, let me speak briefly about our activities related to systems under -- or regions under stress.

From time to time it becomes apparent that the bulk electric system in one or another region is under

stress, even if no actual disturbance or incident has occurred, due to severe weather, outage of one of major generation or transmission facilities, or some combination of such factors.

In these cases, an electricity staff group at the department monitors the state of affairs in the region closely and provides at least weekly status reports to the secretary and other senior department officials.

In some cases, we have been able to send technical staff to the affected region before incidents occur. These people have worked with their counterparts from industry and State and local governments to identify and execute preventive -- or preventive or mitigating actions.

Let me turn to involvement of industry, State, and federal regulatory agencies in these activities.

We endeavor to maintain an active dialogue, as appropriate, with other parties, and we would be pleased to work more closely with the Commission on matters of common interest.

One of your questions in the letter of invitation concerned activity on our part with respect to nuclear safety issues in the context of reliability, and so far as I am aware, the department has not as yet found occasion to give explicit attention to nuclear safety issues in relation to its reliability activities, but we would be happy to work

with you to find a way to focus those.

CHAIRMAN JACKSON: Well, a beginning would be if we are clearly in the interagency process.

MR. MEYER: I appreciate that. If you want to play a role, I cannot believe that there wouldn't be an opportunity to do that.

Let me turn to our interest in the independent system operator concept.

The department has a keen interest in the ISO concept in general, although we do not wish to be understood as endorsing any particular one of the many ISO designs and proposals now in circulation.

The ISO concept became popular as it became apparent that in the competitive wholesale market, it will be necessary to ensure that regional transmission networks are run without discrimination against any participants in the market's commercial transactions, and that utilities that own both generation and transmission could avoid

conflict of interest problems by acceding the operation, if not the ownership of their transmission facilities to an independent party.

But secondly, it also has become apparent that there is a need to ensure that the regional transmission networks would be run without stressing them beyond their physical limitations, but also without allowing those

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limitations to be used as a pretext for discrimination to the advantage of some market participants and the disadvantage of others.

Both of these concerns imply that there will be a strong and enduring need for independent regional scale transmission entities. As federal legislation to update the legal framework for the industry takes shape over the coming months, consideration should be given to provisions pertaining to ISOs.

Like reliability itself, ISOs appear to be too important, too critical to the successful function of the new industry not to warrant explicit coverage in the new legal framework.

Let me conclude then by going back to the subject of reliability provisions in proposed federal legislation. The department has not yet offered its proposal, but -- and so here I can only mention ways that reliability might be addressed in federal legislation.

One approach would be to authorize a federal agency, such as the FERC, to approve reliability standards developed by affected parties through a membership-based organization.

The agency that is -- possibly the FERC could also be empowered to approve procedures proposed by a reliability organization for the organization's own activities,

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including monitoring and enforcement of the standards.

Finally, the legislation can provide the agency with the authority to enforce the standards itself if necessary, although the initial responsibility for enforcement might reside with an industry organization.

That concludes my statement and I would be happy to answer questions at your convenience.

CHAIRMAN JACKSON: Okay, I think we'll go through -- I think what we'll do is start with you, Mr. Gent. Is that the correct pronunciation of your name?

MR. GENT: Yes, it is.

CHAIRMAN JACKSON: And then we'll go through the different regional, and we'll let you Mr. Nye, last but certainly not least, tell us the real deal from the industry.

MR. GENT: Thank you, Madam Chairman. Good afternoon, commissioners. I'd like to thank the Commission for extending this opportunity to the North American Electric Reliability Council for us to talk about what we're doing in the way of reliability and how deregulation might affect reliability.

I'd like to start by saying something that's not in my prepared remarks. I've noticed while sitting in the audience that you have this desire to participate in this process and I'd like to offer that invitation for the NRC to

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participate in any, all, some, or none of our processes at any time you would like immediately without going through NERC processes, peer review.

We would welcome your attention. Your staff has visited our offices and I'd like to invite them back because I think a lot has happened since they were there when they were preparing this report that served as a basis for this discussion.

As you know, NERC's responsibility is the high-voltage grid that interconnects generators and load centers. We have three major grids in the United States and Canada. Some say four. It depends on how you count Quebec. That would be the fourth.

We call them in our terminology interconnections and I understand what Commissioner Rogers is saying about the terminology. We have some very strict terminology that probably conflicts with your very strict terminology in many cases.

So as we have defined reliability, we break it into two parts. We talk about adequacy and we talk about security, and I've learned that security means something to everybody a little bit differently than it means to us.

In this case, it means that we must be able to withstand a large contingency outage. Your staff has listed a number of examples in their report, transmission lines,

corridors, generating plants and the like.

Our initiatives dealing with security and standards relate directly to your interests in grid reliability. We require that there has to be enough spinning reserve to be able to withstand those contingencies. We need to ensure that these units that have the spinning reserve are strategically located and we have to ensure things like transmission lines have enough room left to withstand these losses.

The public in general doesn't understand why we can't load transmission lines right up to the maximum thermal rating, and I think after listening to this, I'm sure you understand that there is a stability issue. There is also a contingency issue.

To help us reliably handle the increasing number of transactions, NERC is establishing a network of 22 security coordinators graphically and electricity distributed across North American. And many of the other speakers that follow me will be addressing those security coordinators.

This is the real key to instantly providing a reliable network. These coordinators are going to have their own dedicated communications network, we call it interregional security network, or ISN and it will begin operation as soon as June of this year with some limited

functionality.

Today, our security coordinators are implementing several interim procedures and processes so that the more sophisticated tools that they'll need to make definitive judgments, and, yes, even run stability studies, are fully developed. The ISN is going to ramp up to full functionality later in 1997 and we hope will be totally on line in the early part of 1998.

These 22 security centers will be responsible for conducting security analysis of the grid with on-line data, and will have the authority to take the actions necessary to prevent or relieve overloads or prevent potential risk to the grid.

This very elaborate system should allow many multiples of additional transactions to take place in this

new deregulated open access world that we are surely facing.

You've asked in the notes that I received earlier about how the governance that would involve an independent system operator concept --

CHAIRMAN JACKSON: Before you go on, let me just ask you this question. Do nuclear plants receive any special recognition in protecting their off-site power, their access to off-site power?

MR. GENT: Yes, they surely do.

CHAIRMAN JACKSON: Could you tell us how that

works?

MR. GENT: Yes. In an operational sense, if you look at what I have attached to my material, you'll see that I have excerpted what's called a NERC operating manual. This is just a cover sheet.

If you look a little bit deeper at the table of contents, you'll see something I've highlighted in yellow. It's called operating policies. And then I've gone a little bit deeper. Policy number 5 on the next page, for instance, refers to emergency operations, and then the number E item there is called system restoration.

I realize this is a lot of detail, but if you will shift with me now to a page that's numbered at the bottom P5-7, there will be a reference to system restoration. There's something called requirements. This is something that's required. These are must-do things.

In this case, when you're restoring the system from some system collapse or an outage such as we had in the Western Systems Coordinating Council on August 10th, under the requirements, you see steps one through five. The fifth step in this process is off-site supply for nuclear plants.

This is the first thing that happens after the system is brought back together, resynchronized and judged to be functioning. This is before we bring back any other loads or generating plants. The first thing we do is try to

bring back the nuclear plants.

CHAIRMAN JACKSON: Well, as part of that, do you have specific information as to the coping capabilities of the nuclear units in a particular region to -- relative to how long the unit or units can go without off-site power, the provision of off-site power?

MR. GENT: I don't have information of how long they could go without off-site power.

CHAIRMAN JACKSON: So that's not readily available to those who would be in the position of working to restore the provision of off-site power?

MR. GENT: I don't know that that's the case.

MR. DELGADO: That information is available in the EMS screen. We have figures built into the energy management system that address the needs of our plants. There are written and screen procedures similar to this. And of course we also monitor the plant, for example, the alarm, so that the operator -- even when the plant is out, the operator can do something about voltage levels that is required to meet the requirements of the power plant.

CHAIRMAN JACKSON: I'm asking a slightly different question. That is, let's assume there's been, you know, some loss of the grid, and now you're working to restore the power. I guess what I'm trying to understand, you know that there the different stations have different coping

capabilities depending upon their own on-site power sources and design of the plant. And the question is, is there -- as part of this grid management and restoration you say should be given high priority, but that has to be informed by what the actual status is of the given plant.

MR. GENT: We have actual real-time communication with the plants, and if they were to have specific problems, my operators and the plant operators would be in coordination. We generally know of their requirements and they know of the status of the grid in preparation for these events, and in real time, we can tune the situation by direct telephone communication with ring-down circuits.

CHAIRMAN JACKSON: Do you have a worked-out protocol relative to the nuclear plant?

MR. WOLFF: I'm struggling with the word protocol but we have a worked out, ongoing daily relationship of talking with the plants, and if you will accept that as a protocol, yes, we have a protocol. It may not be written in a document somewhere. It is a general agreement to operate and communicate.

MR. DELGADO: Maybe I can address it. From our perspective, we do have the procedures which have been written in conjunction with the power plant, so our plant staff has -- in preparation for this meeting, I checked and the last one I saw was revised in April of this year, so I'm

satisfied that we're keeping up with it.

Whether or not -- and I cannot answer your question, whether or not the operator knows how long the power plant can be black. By giving it top priority, I can assure you that it's getting it as soon as the operator can, in other words, getting first priority.

So -- and besides that, the communication is pretty solid from the perspective of dealing directly with the power plant by hands off operating and communication is not required. Line communication can be done hands off.

So by having a top priority issue, it assures us -- it assumes the system is energized with the black start plants. The nuclear power plant will be given the first priority in getting access to it.

Besides, since they are connected to a backbone 345, which is the highest voltage we have, in any restoration of the system, you begin with the black plant and you go right to the backbone. So those plants naturally will receive priority because you right away want to get to the backbone.

CHAIRMAN JACKSON: You don't have any 765 kV?

MR. DELGADO: Sometimes I wish we did, but right now we don't, no, and I don't expect we will in the near future, but 345 is quite ample for us.

COMMISSIONER ROGERS: Would that be true in all

the regional coordinating councils?

MR. DELGADO: I have a map here of Maine and I can assure you if you look at it, the thick lines join all nuclear power plants.

COMMISSIONER ROGERS: No. I'm talking about the whole country now. I'm not talking about a regional. I'm talking about now every regional, whether that's the case.

MR. GENT: I'm not sure this will answer your question, but virtually every plant has a procedure and protocol for being restored to the network and there is an order in which they're called in to do that depending on the situation, but everyone has a plan that includes that.

COMMISSIONER ROGERS: See, the question that I haven't heard a direct answer to is whether there is something different about how a power pool treats nuclear plants from how the regional coordinating council treats nuclear power plants.

Because you may have a -- you know, a larger problem than just one that is in a particular power pool grid that extends well beyond that, and then the question is whether the coordinating council has a particular way of dealing with nuclear power plants in the broader region. That's the question I think that we haven't had an answer to.

MR. WOLFF: I brought with me two paragraphs that

indicate that we do have a formal procedure for ensuring that nuclear plants receive the highest priority. That is in conjunction with NERC requirements and I can assure you that the New England Power Pool and New York Power Pool and PJM do it that way. We're known as the three tight pools. I have no reason to believe it's not done that way in other areas. I'm sure it is, but I know for a fact it is done in the whole northeast region.

COMMISSIONER ROGERS: Yeah. Well, it's a question -- it's a national based question rather than a regional based.

COMMISSIONER DIAZ: Is the NRC notified when something like this happens and you're actually trying to restore the load? Is our incident response seen on the network?

CHAIRMAN JACKSON: I think our information comes through our licensees. Okay.

MR. GENT: I mentioned the NERC operating manual. There are a number of other issues in there that you may be interested in and I'd be happy to provide your staff with a copy or as many copies as you'd like and answer as many as questions as you might have.

Regarding the governance issue, whether governance of ISOs is going to affect reliability, we think that that is not going to be the case and I'd like to explain why.

Our initiatives are based on separating transmission operations and reliability from a marketing function. We're trying to do that right now.

If an ISO is a means to achieve this separation of market and operating function, then certainly it will be successful in creating the separation and independence and they will enhance reliability.

What we're doing now with our security coordinators is getting out in front of this. We think that eventually they'll probably evolve into ISOs if that truly is going to be what the industry will be shaped like.

Today, however, we need to move on, and so to make sure that our security coordinators, these 22 locations around the United States and Canada, are truly acting independently, we've asked them all to sign data confidentiality agreements.

This is necessary because some of the data they need for reliability purposes and analysis can be used to somebody else's commercial advantage, and I think you can understand how they're fairly skittish at doing that.

So we think that the best way to handle this, without it taking an awfully long time, is to have them sign data confidentiality agreements. That's in the process

right now.

Our security coordinators will then be independent

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of the marketing function and will not be affected by any decision made by the governance of an ISO.

I've mentioned our operating standards. I need to talk about our planning standards, which you may have some interest in as well. These are not nearly as well-defined as our operating standards. We're now approaching the issue of elaborate planning standards. It's under way and I would invite the Commission to participate.

I'm personally going to take the issues I've heard here today back to the groups working with this and see that there is a consideration of the stability issue, viewing with me your licensees to see that that's an updated process and done fairly often.

I think that as soon as we get into this, we'll see that it is a process that's now considered. I just can't testify to it.

I hope from the comments that you'll hear from those that follow me and from me, we believe that NERC's interest here is really in seeing that the grids are not only reliable today, but they remain reliable through the coming years during the restructuring and after.

We agree in large measure with the conclusions of the report that was presented to you earlier, and then I said earlier, I think we need to revisit not only the report but have the staff revisit with NERC staff to learn what

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changes have been made since they visited this.

I thank you again for this opportunity and I'm sure that there will be other questions. I'll try to answer them along with the others on the panel.

CHAIRMAN JACKSON: Well, I'd like to ask you a question couples relative to the submission that you've made. You were talking about your processes for developing operating and planning standards have been accelerated and are being changed to include more opportunity for input by all affected parties.

And you talked about ways of enforcing standards, and you said regarding that enforcement, one possibility is that we will end up with what are generically called a reliability -- calling a reliability compact, which will probably consist of a series of contracts that specifically obligate the policies to abide by the NERC standards.

Does this need some kind of a federal backing or legislative undergirding? And when the industry representatives speak, I'm going to ask them to address that issue separately. But I want to hear from you.

MR. GENT: You'll probably get four or five different answers. This is currently the issue under debate now. We know what the rules are, we know what they should be. How do you enforce them when somebody says I'm just not going to do it?

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We currently have a process that has worked, but we're anticipating that as competition gets heavier and heavier, we're going to have some people that refuse to obey by the rules.

The best way we have right now is with contracts, and to the extent the contract law works, this will work. But we are debating whether we do need some federal backstop. We're a little bit timid in asking for it because we often get more than we ask for. And I think that was

evident from a previous presentation.

CHAIRMAN JACKSON: Also, I note that you claim that with respect to the last issue we had asked you to discuss in terms of factors and considerations used in establishing reliability governed structures vis-a-vis loss of off-site power events for nuclear power plants, that you say that language is being included in some ISO agreements that requires ISOs to operate the grid in accordance with special operating criteria established by NRC operating licenses.

Do you think that's a good idea in general?

MR. GENT: I think we absolutely must visit that issue to make sure that it has been considered. I'm certain it has. I just can't testify to that. But I will be able to soon.

CHAIRMAN JACKSON: And you also were talking about

that NERC is the home of the generating availability database, and you say you're primarily interested in, these days, in the types of data that would allow us to model a nuclear unit during a transient or slightly slower dynamic disturbance event.

That kind of modeling doesn't go on today? I'm going to ask the --

MR. GENT: Yes, it does.

CHAIRMAN JACKSON: -- industry people to speak to this too. So if it does, what's the issue?

MR. GENT: The issue is one of size. Before, most of this type of modeling has been done by your licensees, and we've learned very recently that these outages spread over entire regions, like the entire western United States, and we need to extend our modeling to include more than just your licensee's area, and having the rest of the world as an equivalent, we need to get into huge modeling, and that's an issue with planning people in NERC.

CHAIRMAN JACKSON: Do you have the resources and capability to do that?

MR. GENT: We're not sure that we have the resources and capability to do that. We need to find out. It's never been done before.

CHAIRMAN JACKSON: Is this a path you're definitely planning to go down?

MR. GENT: Yes, it is.

CHAIRMAN JACKSON: All right. Any questions?

COMMISSIONER DIAZ: I have just a piggyback on the Chairman's question on that next to last paragraph where it says, "language being included in some ISO agreements." Is there any reason why some is selected or are we going to try to -- everyone is using it?

MR. GENT: There's only one ISO agreement now in force and that's in Texas. What's being proposed in California will also honor the agreements of the licensees in that ISO agreement. So that was the reason for the reference to some.

But I think that you can expect, especially after this process today, I think you can expect they will all be aware that there needs to be a consideration in the agreement.

CHAIRMAN JACKSON: Let me hear from Mr. Wolff.

MR. WOLFF: Thank you, Chairman Jackson. I'm pleased to be here to give you some feeling for what it's like to be an ISO.

First, by way of background, I've been in the industry for about 39 years in charge of distribution, in charge of station plant design for Indian Point 1 and 2 when I was at Con Edison, in charge of the control room at Con Edison, which is an 8,000 megawatt control area, so I know
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what it's like to operate a control area as an individual company.

I have had grid planning and construction experience and now four years as the CEO of the New England Power Pool so I know what it's like to operate a grid from a power pool standpoint.

We are effectively an ISO and have been for some 25 years. The term has come to mean new things now, but we have been an ISO for those people that supply the electric industry during that 25 years. That group of people has expanded and the term ISO now means you're dealing with not only utilities, but marketers and the rest.

But we will do very little different in the management of the New England Power Pool from what we have done, and I'd like to give you a feeling for that.

We were formed as a result of the 1965 blackout in order to ensure reliability in that area. What will change as we become an official ISO? Our governance will change.

We like to think that we are very fortunate. We are, at least at present, the only ISO in the nation that will have an independent board of directors. They have been selected and are about ready to be put into place. It is not a sector board of various interests. It is a single monolithic board dedicated to reliability, dedicated to the ISO, and dedicated to supplying nuclear plants and ensuring
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that the facilities are built into the system to make it happen. They have no other vested interest than our interest of reliability. So we're quite fortunate.

As a matter of fact, this meeting is my last official duty before going into retirement. This whole thing is getting ready to move and so I do cherish the opportunity to talk to you just before retirement.

But I can say that I am quite pleased with the excellent board members we have, names you might be familiar with is Charles Stalen and other people with fairly reputable reputations. I think that they will back the interests --

CHAIRMAN JACKSON: Is this the Stalen who was at FERC?

MR. WOLFF: Yes, it is. And we have people in the regulatory markets and in the marketplaces in reliability and in the industry. So we are positioned to move forward.

What else is going to change? Our method of dispatch will change. We have for 25 years been dispatching the system every five seconds on the basis of least cost. That has been very effective. We have huge computers that capture the data, make the dispatch, and monitor the entire system to make sure economy is in place.

What else is going to change? I project that we will have additional power now that we have a board. The
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regulators in New England, an organization known as NEPURG, the New England Public Utility Regulatory Group, are very much behind the process. They were involved in the selection of the board.

They have, as Mike said, actually given me a little more power than I feel comfortable with at times. I

think a limited amount of power is good. I think too much could be dangerous, but barring that possible problem sometime in the future, we have been reasonably well empowered to enforce the reliability rules.

Now, how do we address reliability? I'm very interested in the questions you asked about reliability and stability and that sort of thing.

They do mean different things and they're more or less in the eye of the beholder, but reliability means how much of the time are the lights going to be on? Now, they can go off for different reasons. They can go off because we have a slowly growing load and we've had to go to load shedding in order to balance load and generation when we run out of generation.

First we ask for voluntary appeals, and then we get the involuntary appeals if things get bad enough. We have not had to do that in New England. The last incident that I'm particularly familiar with when it was consciously done was in this area in January 19th, I believe, and it was

conscious rolling blackouts.

CHAIRMAN JACKSON: Is it well -- within a given power pool, is it well understand how low the voltage and/or frequency margins can show before you have a potential for some instability?

MR. WOLFF: Yes, it's extremely well-known and we do the studies, we model the system, and we actually practice voltage reductions during the spring time of each year in order to see that they work and give us what we want and they're not excessive, so the answer to your question is quite clearly, it is known.

CHAIRMAN JACKSON: And that is automatically coordinated with the actual plants or the utilities that operate the plants?

MR. WOLFF: Yes, it is. We coordinate directly with Millstone and have a voltage schedule based on Millstone's needs and they determine those needs and we follow that schedule and drive the base points at the substations around Millstone to make sure they do not go below those voltage requirements.

So we, in fact, do meet your requirements very specifically in coordination with the utilities, and we have some voltage schedules throughout New England to make sure we don't have a voltage collapse.

Now, getting back to the area of stability, once

we have ensured the reliability by balancing load and generation, using both sources, load and/or generation, we have to worry about the stability issue, which is the issue that is taken care of by what we call security constrained dispatch.

In other words, we will not dispatch the system to a load level or to a transmission line loading level which will result in a problem for the loss of any generator or any major system.

So we are already looking in advance. The computers are constantly monitoring, what happens if this generator goes out, what happens if I lose a Canadian power source, what happens here? They will make that study, check the stability, determine if we can survive that event, and if we can't survive that event, we will dispatch additional generation, change the dispatch, go off economics, make a contract with New York to import additional power. There

are many, many ways to solve the problem. This is a cat that can be skinned in many different ways, and it is the job of the operator to determine which way is the most reliable, which is the quickest way, and which will achieve the desired result.

So when we do a security constrained dispatch, we take care of the stability issue. That's how we do that, because stability is something you have to prepare for

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before it happens.

The same as voltage collapse, is something you have to prepare for before it happens, possibly even the day before. If you're not ready for a voltage collapse, it's too late to do anything about it. Once it starts to sag, you're in a worse position than before it sagged.

So that all will remain exactly the same in the New England Power Pool. We're quite fortunate. For the last 25 years, the New England power utilities have allowed us to operate that grid as if we owned it, and they have charged us with operating it as if we own it in order that they could gain the relief necessary for knowing somebody is looking at the farm and making sure everything is done properly.

We look at the whole system in a coordinated way. We coordinate with the New York Power Pool, we coordinate with Quebec, we coordinate with PJM. We even are limited by certain flows across the central portion of Pennsylvania that limit our Canadian imports, so there is the ability and it is done every day in practice to coordinate across regions, and it is done by the operators in real time and is in no way in conflict with what Mr. Gent is suggesting, a broader and greater scope of this coordination, and I wholeheartedly support that additional scope as part of an answer to one of your questions.

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I mentioned the security constrained dispatch. We continue to support all of the NERC criteria. We as operators find it very consoling to have that criteria in a time of competition. There's no question that the members, the players in the market, have fiduciary responsibilities to their stockholders and they will have to make tough decisions, but I am sure they won't directly conflict with reliability, but having a set of standardized rules and ISOs who are empowered to take care of the reliability aspect is very consoling.

If you stop to think of it, there are only three people that are interested in reliability: The customer most assuredly is, the regulatory bodies, and the ISOs. I don't believe it is proper to charge the individual players totally with reliability because they have a direct conflict.

We are prepared to set the system up and make sure that the incentives are there for all the players to bring to the table the assets that we need, transmission, generation, and the like.

In the past, we have monitored reliability by looking at reserve levels and doing a statistical analysis, Monte Carlo type outage analysis on generators, lines and the like.

In the future, since we don't have direct control

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of that, we in New England have decided to go toward other incentives, such as operable capacity.

If you remember when Pilgrim was out for several

years a couple years back, that plant received capacity credit and was in the planning criteria even though it had been out for two years. The owning utility got capacity credit because statistically it works. There were other plants that were in.

In the world of the future, we will not be able to give capacity credit for two years for a plant that is not operating. So we have changed our criteria. We are insisting that all the players go to operable capacity to take care of reliability.

What I'm saying to summarize is, we can take care of reliability several different ways, and in this new marketplace, we will have to find those new ways to take care of reliability. There are ways. If we do it right, there's no reason for reliability to suffer and there's no reason for anybody to have interests that conflict with DOE, your Commission, or anybody else.

CHAIRMAN JACKSON: Do we need any kind of federal legislative backing?

MR. WOLFF: Well, I think NERC is in a position to require these things. I think the good faith and support of the Federal Government is always good. A limited

involvement. I'm one of those people who believes that limited involvement is probably good. Complete ignoring the situation certainly is not good.

Too much involvement, my personal opinion, is not necessarily good either. That's just my personal philosophy on things.

CHAIRMAN JACKSON: But a system where some agency, whether it's FERC or whatever, might lay out some baseline criteria but that the NERC has the primary responsibility but the ability to enforce it based in some statute is not a problem?

MR. WOLFF: No, that's not a problem.

CHAIRMAN JACKSON: Okay, let me hear from Mr. Eyre from Western Systems.

MR. EYRE: Chairman Jackson, I'm sure you're aware the WSCC is the largest and most diverse of the ten regional reliability councils of America. WSCC has 99 members ranging from 71 traditional utilities to 10 independent power producers and 18 marketers. So we have all segments of the industry involved in the council's activities.

It also includes three regulatory representatives that serve on WSCC's Board of Trustees. Let me take a moment just to review with you who is responsible for reliability today and where it should be in the future.

As the industry restructuring occurs and we

implement competition, it is imperative on all of us to make sure that we maintain a reliable electric system.

For over 30 years, NERC and the regional reliability councils have been the caretakers of reliability through the cooperative development of NERC and regional council policies, procedures, and criteria.

There is no reason to doubt the ability, the appropriateness and the resolve of NERC and the regional reliability councils to continue to serve as self-regulating organizations.

CHAIRMAN JACKSON: Now, you're telling me this in spite of the two events that happened in the summer of 1966 -- I mean 1996?

MR. EYRE: Absolutely.

CHAIRMAN JACKSON: And why should I have that comfort?

MR. EYRE: Why should you have that comfort? I think what you see happening as of the disturbances that happened last summer is a resolve that the councils are doing right now, to make sure that everything is in place, everything will be administered, and as I go on through my presentation, you'll see, at least in the west, we're moving rapidly to implement a reliability compact that calls for mandatory compliance with sanctions, incentives, financial penalties as may be appropriate.

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CHAIRMAN JACKSON: And that did not occur before? That did not exist before?

MR. EYRE: We did not have the sanctions and penalties provisions available to us prior to those disturbances.

CHAIRMAN JACKSON: So you're saying that you've gotten religion now and that's the reason --

MR. EYRE: That's a good way to put it. It was a wake-up call to the whole industry to see what can occur if in fact we do not have the mechanisms in place to make sure we have compliance with the rules of the road.

CHAIRMAN JACKSON: Okay, go on.

MR. EYRE: WSCC and NERC are committed to enhancing accountability for reliability and improving compliance with reliability standards. WSCC strongly favors an industry self-regulating organization approach with a federal and/or state regulatory backstop as may be appropriate.

Let me take a few minutes just to outline to you some of the activities that are being taken in the west to ensure reliability.

CHAIRMAN JACKSON: Let me back you up. Elaborate on that sentence a little bit.

MR. EYRE: As far as the backstop is concerned?

CHAIRMAN JACKSON: Correct.

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MR. EYRE: I think I would support the earlier comments, that I think a limited involvement would be appropriate. I think it is also necessary. There is one thing that the industry cannot do by itself. It can design programs for mandatory compliance. It can design a program for sanctions, incentives, and penalties, but it has no way of assuring that it can get everybody at the table and that's where we need support from the regulatory community, to make sure that everyone is at the table helping design those mandatory criteria and making them accountable and also subject to the penalties or incentives that we feel is appropriate.

CHAIRMAN JACKSON: So would this kind of backstop be some kind of federal action, say, mandating NERC membership?

MR. EYRE: There are several ways that that could be done. That is one way it could be done. It could be done through licenses by the Public Utility Commissions of the various states. It could be done with -- through FERC mandating to the jurisdictional utilities who they do business with those types of things. Those are just various options.

WSCC is continuously and expeditiously implementing new protocols and mechanisms to ensure reliability is not sacrificed as we restructure the

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industry.

In 1996, the WSCC Board of Trustees unanimously endorsed a reliability compact that reaffirms the council's mandatory compliance requirements and which will result in the enforcement of established reliability protocols in the west.

The compact recognizes that to ensure continued reliability, all market participants must adhere to the established reliability protocols.

A policy level group has been formed to develop incentives and sanctions for implementing the reliability compact. These recommendations will be submitted to the WSCC membership by the end of 1997.

The WSCC agreement states that all control areas, which includes the ISOs, must be members of WSCC. And as such, they must comply with all WSCC and NERC protocols and sanctions.

Also, and of importance to you as we've already discussed, the most recent filing of the California ISO filing includes a transmission control agreement which requires the ISO to meet the WSCC and NERC protocols and the provisions of NRC plant licenses.

In addition, system operators are required to give a high priority to nuclear plant restoration, as already mentioned in the NERC policy 5. I believe, however, that we

must make a careful review of this policy to make sure that this issue is properly addressed, and therefore, I will be recommending that NERC and WSCC criteria and procedures be reviewed and revised as necessary to meet the nuclear plant requirements.

Second, mandatory compliance does not stop with WSCC. As you've heard, NERC also made compliance with its protocols mandatory. By establishing a system of mandatory compliance, all market participants will be accountable for adhering to established protocols and result in a level playing field.

Within WSCC, we have another reliability program which has been established and is called our compliance monitoring program, which reviews members' compliance with WSCC minimum operating reliability criteria, WSCC operating policies, procedures, and guidelines, and NERC operating policies.

In addition, WSCC and NERC are in the process of enhancing their operating protocols to make them more specific and measurable as possible. They will have to be measurable and specific to be enforceable under a mandatory compliance program which requires the application of sanctions and penalties.

WSCC and other regional councils are implementing additional security measures. These measures will enhance

interconnected system reliability through the exchange of information required to assess system security and reliability, including on-line power flow and security analysis and increased system monitoring.

These measures will enhance the operator's ability to identify potential reliability problems and promptly take proactive corrective actions to ensure system reliability.

The council has approved a regional security plan that is intended to convey both the responsibility for overall system reliability and the authority needed to carry out the responsibility successfully.

This plan was developed and is currently being implemented in response to one of the four strategic initiatives for reliability established recently by NERC.

The regional security plan empowers the security coordinators to take the actions necessary to preserve reliability. The California ISO will be one of the security coordinating centers, and it is envisioned that as the other ISOs are formed in the west, they will also become the security coordinating centers for their section of the interconnected system.

WSCC has also established a successful training program that has been carefully structured to provide system dispatchers and other operating personnel with the necessary skills to deal with the ever increasing complexity of

interconnected system operation.

In addition, a schedulers/contract writers training program was implemented in 1996. This training program familiarizes schedulers, contract writers and energy accountants with system operations and increases their understanding of how their actions impact interconnected system operation and system reliability.

Although WSCC currently has an operation training program, we are currently working with NERC to implement a certification program.

Moving on, you have often heard the question or maybe asked the question yourself: is the transmission system being used differently than originally designed and will it impact reliability? The answer to the first part of the question, is it being used differently than originally intended? And the answer in most cases is yes.

Will it impact reliability? As long as established operating protocols and those implemented by the industry are followed, transmission reliability should be preserved. Industry and regional reliability councils recognize the changing competitive nature of the industry and the impact this may have on system operations.

As such, and as we speak, new protocols are being developed to address changes occurring and being forecast for electric system operation in the future.

As we restructure --

CHAIRMAN JACKSON: Let me ask you a question. These new protocols that are being developed as we speak, how are they going to be verified to be adequate?

MR. EYRE: Well, number one, in our compliance program, they will be part of our protocols criteria that must be followed. As part of our compliance program, we will be monitoring those to be sure they're complied with, number one, and through that compliance process and review process, we will identify the needed changes that will be needed.

As we restructure the industry, there are a few implementation issues to consider. We must make certain that interconnected system reliability is preserved. As time frames are established for restructuring the industry, we must all bear in mind that these time frames must be realistic and prudent, and that they may have to be revised to maintain reliability.

The regulatory community, especially the Federal Energy Regulatory Commission and the state regulatory agencies will need to serve in a backstop role, providing NERC and the reliability councils with the required tools to maintain and ensure reliability. The regulatory community

should then hold NERC and the reliability councils accountable for ensuring reliability.

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We must ensure that all entities that own, operate or use the interconnected transmission system are complying with the established criteria, guidelines, and policies. To ensure compliance, NERC and the reliability councils must be able to monitor those involved and correct those in non-compliance.

Where financial or business incentives cannot be developed to ensure compliance and accountability, the regional reliability councils and NERC, working with the ISOs and others, must have the ability to impose sanctions or fines on non-complying members, so that one participant's non-compliance does not degrade reliability or increase costs for other market participants.

Federal or state action mandating membership in reliability councils and NERC or some other federal or state mechanism will almost certainly be needed to equitably administer the costs of maintaining reliability and ensure compliance with the rules of the road.

In conclusion, restructuring will impact the electric industry. That impact can be positive if all of us involved in the restructuring process do it right the first time.

Commercial pressures may stress the reliability of the electric system. Consequently, we will need to ensure that balance between competition and reliability is

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maintained.

We need to move through restructuring in a prudent and timely manner. However, we must manage this transition with a critical eye if we are to be sure that there are no complications that develop which will not impact our objective of preserving reliability.

The ISOs being formed in the west will have a responsibility to maintain system reliability, and as members of WSCC, will play an important and essential role in administering interconnected system reliability.

NERC and the regional reliability councils, as self-regulating organizations, having the support of the regulatory community must have the appropriate tools and therefore ability to continue to effectively manage electric system reliability.

No matter how dramatically the industry changes and evolves, the public will expect and demand reliable service. Mandatory compliance, reliability monitoring, enforcement capability and accountability will be essential for ensuring the public's desired level of reliability.

Thank you.

COMMISSIONER ROGERS: Yes, I was particularly interested in your note that you're working to implement a certification program. I wonder what your thoughts are there with respect to what the significance of that

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certification program might be.

It sounds to me like a very good idea and one that might help to really ensure some uniformity in handling very complex situations as they might develop any place in the country.

Is this a program that you would think would be applicable to all of the coordinating councils or just your own?

MR. EYRE: No. In fact, my comment was that we are working with NERC, with Mr. Gent's organization, to put in place both a program which would accredit training programs and certify system operators throughout the country.

COMMISSIONER ROGERS: It sounds like a very good idea. This is something -- the type of thing which we've been very concerned about with respect to nuclear power plant operators' training, and there are some good models, I think, within the nuclear industry that -- NPO for instance, Mr. Nye is very familiar with, that might be helpful to you there in carrying that out.

CHAIRMAN JACKSON: Commissioner Dicus?

Commissioner Diaz?

Commissioner McGaffigan?

Mr. Delgado.

MR. DELGADO: Thank you very much, Dr. Jackson,

Commissioners. I am director of electric system operations for Wisconsin Electric and I would like to tell you what that means. I'm responsible for every aspect of transmission service, the control center, construction, planning, protection. My background is power plant operations, all fossil though.

I would like to begin with a rather uncontroversial statement. I would say that deregulation will not impair transmission security. In my brief comments here, I hope to be able to --

CHAIRMAN JACKSON: You say that was a controversial statement?

MR. DELGADO: No. I said uncontroversial but I suspect that you might not totally agree. I hope to be able to back up the statements to give you a sense that this is not genetic optimism, but in fact there are very valid reasons to believe so.

First, let's begin with two provisions. The first one is that the consequences of unreliable electric supply -- incidentally, I appreciate Commissioner Rogers' comments regarding the terminology, and I did select the terminology very carefully here because I think it will add clarity to the subject and I think it will help the Commission identify its objective.

As I was saying, the consequences of unreliable

electrical supply which are -- you can conceive are frequent burnouts and rotating blackouts, are not acceptable to the North American customers. This is, to us, assurance that there will be a continuous motivation and incentive and that, in fact, will be powerful.

Second, the physical reality of an interconnected electric network will not be changed by either deregulation of the industry or by the growth of competition. The power plants will move, and frankly, from the perspective of physics, it will look very much the same.

I will add to it that from every aspect, I would predict that transmission service will continue to be a regulated monopoly. I do not think that anybody can conceive of building a parallel competitive system, and to me, that's the definition of a natural monopoly.

Besides, there is, I would say, a very solid consensus in the industry about the necessity to maintain reliability. To a greater or lesser degree, all portions of the transmission network support each other.

At a transmission level, all users using an

interconnected network share the same reliability. No individual transmission owner can choose to build, maintain or operate its system to a lesser reliability level without affecting other entities within the interconnection.

There is no alternative to keeping a high degree

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of transmission network reliability. Practically speaking, the reliability of the network is the highest reliability available to any single user. Obviously at a distribution level, other things can be done.

Security and adequacy are two aspects of reliability which will help to explain the issue here. The NERC definitions are at the end of the document but I would like to rephrase them.

A transmission network is secure if it operates within adequate voltage and frequency margins and survives contingencies without cascading failures. It is adequate, however, if it in fact is able to meet the needs of the customer with the level of assurance the customer thinks they need.

The electric system operation is the epitome of real time. Either generation matches the electrical demand or the demand must be reduced to match the generation by taking delivery. Any major mismatch of generation and load will result in localized equipment overloads and low voltage operation that could lead to equipment damage and cascading system failures. This is like a primer in transmission operations. If I drag you through it, I'm sorry.

If the whole interconnection, and you realize we have three interconnections in North America, is overloaded, system frequency would decay and that would lead even to

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more sudden and wider disruptions of network operations unless it is arrested, and of course we have the mechanics to do so.

When a transmission system cannot deliver sufficient generating capacity to meet the load demand, system security will be maintained by disconnecting load as necessary to balance the remaining demand with the generating capacity so the transmission system can deliver reliably at any particular moment.

Load reduction is achieved through the exercise of curtailable contracts with customers, and I would say also with appeals to the customers incidentally, which in fact it can become very, very effective, and by rotating blackouts after the demand side programs and appeals have been exhausted.

From this perspective, rotating blackouts are controlled actions of the operator in order to match load to generation when generation is not enough to meet the load. These are not failures of the transmission system. Such actions are directed at the prevention of equipment damage and black plant shutdowns which have a high potential of costing our plant equipment damage, and of course that means that we would have then long-term problems.

Unfortunately, the distinction would seem irrelevant to the end user, but it's extremely significant

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for the maintenance of long-term adequacy. It is also at the heart of this Commission's concern with electric reliability's impact on the safety of nuclear power plants.

So electric system operators have the means to assure security even when the system is not adequate. These

means include computer-based controls and communication systems which all control areas have. These are the energy management systems, or EMS, whose procedures, the training and the necessary authority to take appropriate actions, and I would like to just on the side say that once a year, the chief operating officer of each company in Wisconsin sends a letter to the operators reminding them that they have all the authority required to keep the system secure, including dropping firm load. They do not have to request permission to do so. And it is renewed. We try to renew it once a year, make sure everybody knows about it.

All of the more persuasive scenarios being proposed for deregulation of the industry recognize the imperative necessity of retaining the system operator's focus on electrical security. An adequate system, on the other hand, must secure by necessity, because there's no adequacy if the system cannot stay on.

Long-term system reliability, both adequacy and security, are the result of appropriate transmission and generation planning. Generation planning is directed at

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meeting the projected demand growth in the most economic fashion.

Transmission planning, in turn, is traditionally intended to connect generation to load and it has been said already here several times. It also is intended to increase reliability at the least cost by promoting the sharing of generation resource margins across the interconnection.

In a competitive electricity market, the entities with contractual or regulatory obligation to serve end load, and I'm not specifying what that might be because there is no need to specify it -- there are many possible outcomes -- they will provide the necessary generation, and I say transmission resources through firm contracts. In other words, they will assure that there is sufficient firm services in order to meet the obligations of the load that -- meet the load that they're obliged to serve.

If those resources are not sufficient to meet the demand obligation, system operators will be able, as they are today, to maintain the system energy balance with the traditional means already noted using curtailable contracts and ultimately implementation of rotating blackout.

As I repeat, rotating blackout is in fact the ultimate goal. I do not want to give you the impression that we look forward to using it.

I say that regional transmission planning will

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improve long-run adequacy and security by removing constraints. Two of the most widely expected developments for the near future of the electric industry are original transmission planning and the establishing of grid wide tariffs that eliminate the stacking or pancaking of transmission costs for generation located for most of the load. I would say of course that we also expect regional operations is very much in the near future.

Regional planning will facilitate the elimination of transmission congestion, even though the most economic solutions often span jurisdictional and property lines, and I can assure you that the transmission limitations affecting the state in which I live, Wisconsin, are not in Wisconsin. I had to explain that to the governor last Monday because he wanted to do something in a hurry, and I'm sorry. Actually, they're outside of Wisconsin, so we had to work through the region in order to remove them.

Grid-wide tariffs, in turn, should promote the shifts and deciding of new generation locations that expand rather than constrain transmission facilities. This would improve the effectiveness of the existing transmission system.

And of course proper location of transmission can expand transmission capability -- I mean, proper location of generation can expand transmission capability, and of course

the fact that the cost is in different locations for transmission service will improve the -- will motivate the proper location of generation.

In varying degrees, all regional councils have achieved some coordination of the operation and planning of transmission systems. Obviously if the council involves a pool, there is more coordination.

The main area, of course, is not a pooled area. However, there is coordination.

The push for greater integration of regional operations is urged by the rapidly increasing number of entities transacting the transmission network.

Let would say that before the EPACT of 1992, we probably transacted with six entities, which we were directly connected to. Right now the list is probably upwards of 50 or 60 of them.

Many of us are convinced that regardless of the process of deregulation, there's already a need for independent regional system operators with real time information and authority over large areas of the transmission network. And I could illustrate that if you had any questions about it.

Wisconsin Electric, me personally, is participating with other Wisconsin and Minnesota utilities in information of what we call the upper Midwest ISO. This

was an ISO filed with the FERC last October by the Primergy applicants, but it was put together with the assistance of a variety of Wisconsin and Minnesota companies.

We also are participating with 25 other transmission owners in forming the Midwest ISO which should be filed with FERC this year. The structures of the ISOs are compatible. The Midwest ISO goes from West Virginia through Ohio, Pennsylvania, all of Indiana, Illinois, Missouri, Wisconsin, Michigan. I don't want to forget anybody.

The efforts should result in one very large entity responsible for transmission operation and planning over a vast portion of the Midwest.

Some of the key features included both in the upper Midwest and the Midwest ISO proposals, and just to refer to some of the comments I already made here, it will have real time information over the broad area of the network. The whole area will have information on it.

It will have authority over all transmission operations including the dispatch of generation to assure network security, would produce a regional transmission plan, will operate within rules set by reliability councils and regulatory entities.

So the ISO will not set its own rules. It will operate within the rules that are given to it by the

councils and by the regulators.

Transmission owners will maintain responsibility

over local system conditions, over hands-on maintenance and operation of their equipment under the authority of the ISO, and I would say these last two features, the fact that the rules given to it, and they do not -- and the ISO will not develop its own rules, and the fact that the transmission owners under the ISO will still remain in control of the hands-on operation should give some comfort to this Commission.

The ISO will uphold all special reliability requirements and priorities of generating plants and large load centers, and there are a variety of them and I would assure you that the text we are working on in the Midwest ISO does say that and in fact it will refer specifically to nuclear power plants.

This would include the technical specs of the nuclear power plants. These requirements will be identified with plant owners and/or operators and it will become a part of the ISO procedures.

I would like to address just briefly the training -- the basis of system operations just to illustrate a little bit of what goes on in system operations.

Electric system operations for Wisconsin is typical of transmission groups throughout the Midwest.

There are 13 systems supervisors. These are fairly well paid, highly trained individuals.

These employees perform the transmission operations and generation dispatch functions around the clock seven days a week from the system control center that we have west of Milwaukee. There is an on-line backup center in Appleton, so all the computer software, all the communication is doubled up so in case there's a failure, the backup can in fact take over operations.

The energy management system monitors special reliability requirements. Nuclear plant requirements are built into the EMS display. There is voltage monitoring and there's voltage alarms that allow the operator to know, and those are set to the limits within which the power plant has to be. Likewise, there are operating procedures which are built into the computer displays so that the operators in fact bill them out for consultation as necessary. There are also paper procedures that back that up.

The system supervisor is selected from a variety of work backgrounds that include plant operations, both fossil and nuclear. We have them from the military, but also from the nuclear power plant, electrical design employees, protection, planning, and startup.

This variety is put to use in the development and revision of operating procedures and in the process of

cross-training the group, which is an ongoing effort.

On the job training, with the use of procedures under the supervision of an experienced employee -- and this is the way we bring the new employee -- forms the core of the training program.

However, the Wisconsin companies perform joint training of system operators through the WUMS, what's called WUMS, Wisconsin, Upper Michigan System, system operator training, and the purpose of this is that it in fact allows that all the operators in fact work together even though they're in different companies to learn the same basis and it's a lot of practical information they learn together.

We are in the process of revising that and we should have that coming up this year and be able to restart

that whole effort.

And I would say that future NERC operator certification would provide greater nationwide uniformity to train system operators, and we look forward to it. In addition, NERC and Maine, though NERC has requested it, has completed the certification of control rooms to make sure the control rooms in each control area have the adequate elements to be able to do the job.

You asked, if you want to, for a legal background. Would you like me to comment on it?

CHAIRMAN JACKSON: Sure.

MR. DELGADO: We think there is a need for some legal backdrop or some legal action. For one thing, we think it's very important to finally clarify among the agencies of the government who has the authority over reliability, and as we stated earlier, that is somewhat vague.

We think it is important to make very clear that all entities using the network must follow the same rules, and that means jurisdictional as well as non-jurisdictional, and that is not clear to date, even though I will have to add that non-jurisdictional entities by and large do belong to the NERC regional councils.

We also have to keep in mind that we're talking about the North American grid. Canada and Mexico are an integral part of it, and it is important that whatever rules we agree to, and of course they participate in NERC, that they do too, and so the sense of obligation and participation is something that may require government to government dealing. It has to be clarified.

And then ultimately, we are of the opinion that regional operations in fact is a necessity and ultimately, even though it should not be specified as how to do it, it should be a very strong indication, either through law or regulation, that all entities must participate in regional operations, and that of course is controversial, I have no

doubt.

CHAIRMAN JACKSON: Thank you. I think I'm going to go on to Mr. Nye and then we'll take any commissioner questions.

MR. NYE: Thank you, Chairman Jackson. I would say in view of the lateness of the hour and our physical physique is maybe affecting our mental acuity, I will seek to try to summarize as best I can and not try to repeat what has been said here today.

I am president and CEO of Texas Utilities Company, a large integrated utility in Texas. That is the owner/operator of a large nuclear power plant, and I am also currently vice chairman of NERC and a member of the DOE Reliability Study which has been referenced previously.

If I could simply ask you to refer to the remarks that I've provided you previously, and I'll seek to try to sort of summarize from some notes I've made as I sat here.

I think it's clear that restructuring, and in some degree deregulation, can impact reliability of the grid negatively. Restructuring will likely change the traditional way the grid is used. That is, more users, more heavily loaded circuits and the like. If we are to maintain traditional reliability of the grid, it will require some vigilance, various steps and some precautions.

Markets offer many benefits, but markets also may

operate in dynamic stress with reliability. Grids are not perfect and we should keep that in mind. They have not been perfect in the past, nor will they be perfect in the future, but the record today, particularly over the last 30 years, is pretty exceptional.

My view is that the current reliability of grid is good, and I will say that recognizing that as we leave this meeting, there may be an incident, and so notwithstanding the fact that there will be from time to time operating circumstances that are and will be of concern.

The question really is the question that the Chairman asked at the very outset, and that is, will the reliability of the grids be maintained as the industry changes?

In that connection, I think it is helpful, at least I found it helpful, to divide this issue into two halves, the one-half being the supply and what we've tended to think of as an infinite supply of electricity always available to everybody who wishes it on short notice.

I think as to the supply, we've got to depend on the market. I think markets do provide adequate responses to consumer needs, but when I studied economics 101, there was a proviso there. It said, markets respond to consumer demands over time. And so that at any one time, the supply may or may not be adequate under a market condition, and I

think some customers will choose to buy under less than optimal conditions, some customers will choose to secure supplies that are very reliable, very dependable, and in connection with their particular need.

So if we can set the supply on one side and the grid on the other side. The grid is reliable. The grid can be maintained, very reliable in the future, providing that we ensure certain provisions.

As a part of that reliability, I think it is clear that security coordinators, and they are variously referred to as ISOs and RTGs and councils and what have you, but there is a function that must be performed someplace that sets the security of the grid above all other considerations that does not deal with the market considerations and that does not deal with the equity of someone's economic position, and that is the essence of what I think -- when I talk about an ISO or security coordinator, that I'm looking for and I am seeing.

My view is that NERC, reconstituted and renewed, provides the best vehicle for securing the reliability of the system. I do believe that NERC and NERC standards can be developed by full participation by all players in the industry, all the new players, as well as the traditional players, and that those protocols, reliability standards and so forth will require either governmental or regulatory --

legislative or regulatory backup.

I think there's precedent for that sort of thing in the way we operate the securities markets in this country. The government has seen fit to allow the market to work to its fullest extent and to allow self-help agencies to conduct very serious and critically important activities, commercial activities, and yet the government always provides some backup and some assurance that the sanctions and the incentives that are provided by the commercial market do have a backup in the event that there is a failure in that regard.

I am anxious to make the point that the work that NERC is doing is more in the nature of renovation. It is not in the nature of basic construction, and you asked earlier, Chairman Jackson, what confidence do we have that these new standards will be all right. I think we've got 25 or 30 years of experience under generally those kinds of standards, those kinds of protocols, those kinds of expectations, and the changes that are being made are changes that are being made to accommodate more players under a more rigorous circumstance.

In that connection, I do think that the ISOs are developing along the right lines in this country, that is, the security coordination function, and I do think we need to be careful about the definition when we talk about what

an ISO is.

I'm pleased to report that ERCOT has a broad governance-based ISO, and in connection with all of the ERCOT standards, I'm very pleased to tell you that as has been traditionally the case in all the regions with which I'm familiar, the nuclear power plant needs and criticality is treated as the first and foremost consideration.

I think as we develop improved ISOs or improved security coordination agreements, that nuclear power plant needs will be recognized as a high priority.

I think there are six key elements for transmission grid reliability and I'll speak to them very quickly. Mandatory reliability protocols applicable to all market participants with sanctions for non-compliance.

Security coordinator oversight for the big picture on the regional or broader basis.

Monitoring of operations in real time to ensure compliance.

Authority of an ISO or a security coordinator to be responsible for security to implement corrective measures as needed to ensure reliability.

Complete sharing of reliability analysis and data around the market, and competent system operators, and that's been referred to previously.

I think that everyone must recognize the

potentially serious consequences of core damage due to loss of off-site power. I do believe that the NERC reliability criteria focuses on keeping the grid reliable, operating above security and contingency limits and always leaving margins available to assure grid reliability.

Nuclear power plant reliance on secure transmission grids is recognized by owner/operators and it's important that everyone involved with the industry restructuring be extraordinarily sensitive to this requirement.

I do believe that regulatory and legislative bodies must give priority attention to the reliability needs of nuclear power plants, to the many reliability-dependent customers, and to the importance of a highly reliable electric supply system to the Nation's economy.

I think I would conclude simply by saying that I think we can manage this well. I think we can accommodate the new market players, and I think we can accommodate a major paradigm change in the traditions of the industry, but I don't think it will happen unless we are vigilant about it, unless we take the precautions that are appropriate.

CHAIRMAN JACKSON: Thank you. What I'd like to do

is I have a couple of questions and you can tell me in answering them if in a certain sense they have been addressed already.

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I'd note that you were saying the best prospect for assuring reliability is the enhancement of the NERC organization. Do you mean along the lines that have been already discussed or are there some other specific?

MR. NYE: There are probably shades of gray between the speakers I heard today as to what they would expect with concern to NERC. I think there is perhaps on the part of DOE, and I won't speak for David, but I think there is perhaps a concern and I think probably so, that there not be a continuation of some narrow focused group of players that determine standards, and I think NERC is in the process of delivering a governance which will assure that all the players have full participation in not only the enhancement of the existing standards, but the confirmation that those standards are appropriate, and I do believe they are appropriate and I do believe they will stand the test of time.

But with that one qualification, and understanding that it is natural, given that the players who have run the reliability system, the grid system in this country for so long have come principally from the traditional electric utilities, the investor owned, the federal agencies, the co-ops, the munis, but not the IPPs and not the marketers, and those folks have to have an equal participation.

Given that in the governance, I think the

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reliability standards that come out of NERC give us the best shot. We've been at that for 30 years. It doesn't stand to reason that we would start over trying to establish a whole new set of standards and practices, but rather to fix the ones we've got to ensure that everyone is treated fairly and that the market is not encumbered by the absolute necessity to maintain the reliability of the grid.

CHAIRMAN JACKSON: You think by having this restructuring and empowerment of NERC, that would also address the question about movements of power between grids? Because there is an issue, you can take care of your own regional network, but you could have internetwork movement of power wheeling.

MR. NYE: Yes, Dr. Jackson. I do believe that the only hope for interregional conduct is through some national organization, some national standards, such as NERC, and certainly we have all the experience with NERC and I can't imagine that we would seek as a nation, through changing the public policy, the way we run our utilities to start over with a system that essentially is prepared to handle that problem.

CHAIRMAN JACKSON: And do you think that NERC's reliability criteria should have a direct linkage to NRC criteria or not?

MR. NYE: I think that the NRC has to be satisfied

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that whatever system is put in place that the public policy, the Congress, and the state legislators will evoke, that they have to be satisfied that it works.

Whether or not the NRC needs to be an active player in each of those activities, I would rather doubt. I'm a little bit back to what Dr. Rogers said, which is, we have to, at the NRC, take for granted what is out there.

Now, certainly we ought to -- we. You all ought

to be a party to the public policy debate and it seems to me that holding up reliability as a critically important element in nuclear safety is likewise parallel to the equal concern that many high, high reliability customers that require critical reliability or are depending on -- I'm not saying this very well, but the concern you have about nuclear power plants having adequate off-site power is shared by a number of electronics and computer and other manufacturers that must have a high degree of reliability all the time.

And it is also necessary for the economy of the nation. I don't think we're about to jettison the feeling that we need to have the most reliable electric power system in the country, and I'm sure DOE doesn't intend that, nor does FERC. We're all working towards accommodating a new market consideration consistent with the traditional reliability that we have come to enjoy.

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CHAIRMAN JACKSON: Thank you.

Commissioner Rogers.

COMMISSIONER ROGERS: Well, just I listened very carefully to your remarks and read them. I wasn't sure though whether you felt that some kind of federal legislation was desirable here or not.

MR. NYE: Well, it's probably against my interest to say so. But I do believe in due course some sort of federal legislation as it relates to regulatory sanctions may be necessary.

I do believe that states and local governments should act first, and generally I'm inclined to think that government closest to the people is best, but this is a national issue. It involves a national market, perhaps an international market, and therefore I think some sort of minimal enforcement standards that does not intrude upon the market or does not try to conduct a command and control type philosophy will be necessary.

I don't think that's imminent. I think that can happen in three or four years, once this plays out and we really understand what sort of a market we have and what sort of a problem we have.

I do believe that it's better to have a self-help industry group composed of all the players bring forward standards that do the least damage to the market, that

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inhibit the market the least amount, and yet absolutely ensure for all the players, not only the NRC but others, that this will deliver a highly reliable grid system upon which we can rely.

COMMISSIONER ROGERS: Thank you.

CHAIRMAN JACKSON: Commissioner Dicus.

COMMISSIONER DICUS: One quick question, please. And this is a question that Mr. Wolff responded to from the Chairman. It had to do with whether we know with some reasonable certainty what the floor is with regard to grid voltage and frequency or any combination of the two below which we shouldn't go because we know at that point that we would have some grid instability situations, and you said yes, and for your council, you knew what the number was and you were prepared to deal with it.

So my question is probably to you. Is this the case across all the councils across the entire systems? Do we know what that is and are we prepared to deal with it?

MR. WOLFF: It's generally coordinated in the

three interconnections. It's different in each one. I think you can see the reason why, Texas being smaller than the east.

CHAIRMAN JACKSON: But Texas is its own country.

MR. NYE: Great nation, Texas.

MR. GENT: There are uniform requirements in the

various interconnections for different levels of frequency, unit response. This goes right down to the basic individual generating unit, how it responds to the load, where load is shed under frequency, how low the different voltage steps should be, how it's tested. This is all very uniform.

MR. NYE: If I could offer an alert, an alarm or a concern as a long-disqualified engineer, there's one thing to say we know what the standards are and what the limits are and what the conditions are that we need to seek.

It's quite different to imply by that that we understand all we need to understand about the concepts of voltage collapse which have developed in some of these dynamic situations. It's quite a different matter to talk about a steady state condition for which we can plan and which we seek to control and it's quite another to try to anticipate the myriads of millions of different operating conditions that may fall upon Bob or anyone else at any one time and tell you or assure to you that voltage collapse is not a problem, because it is sort of the current concern in the industry, I think. And the more we load the lines and the more we expose the system to unanticipated flows, the more likelihood it is that we're going to have some conditions that we did not anticipate.

So we need to be able to control even under the circumstances of unanticipated demands, and I think that's

perhaps the backup we need to all assure ourselves of.

CHAIRMAN JACKSON: Commissioner Diaz.

COMMISSIONER DIAZ: No questions.

CHAIRMAN JACKSON: Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: No questions, but it looks like Mr. Wolff wants to get in the last word.

MR. WOLFF: I was just going to make one comment, that I can understand the concern of the Commission about how seriously we take the nuclear plants and their supply, but when you stop to think of it, all the operators out there have wives and children in the area and all the operators -- speaking from an area that is relatively short of nuclear power right now, I can tell you that we've missed nuclear power and we would do nothing to jeopardize it in the long run.

The other thing I thought I might leave you with is the cost of an ISO, our ISO costs the ratepayer in New England on average 16 cents a month. So it's too cheap to meter to use in the whole place.

CHAIRMAN JACKSON: No. I thank you, I thank all of you. I appreciate that your wives and children live in the area. So do we all, as do our nuclear operators. We regulate them any way.

But I would like to thank the NRC staff, the DOE representative, the coordinating council, reliability

council representatives, and the industry representatives for a very informative briefing to the Commission on this subject of electric grid reliability and security and its potential impacts coming out of electric utility deregulation but potentially -- particularly with respect to

the security and safety of the nuclear plants.

As I stated in a speech to the National Association of Regulatory Commissioners in January, from the NRC perspective, we've said that deregulation has to proceed with a sensitivity to and an understanding of the vulnerability of nuclear plants to loss of off-site power, and that grid reliability governance structures and operating criteria must reflect this, and it's an important issue to be considered in the formation of independent system operators.

And that this implies again that the standards of performance, operational criteria, and the training of personnel, which we've all spoken to today, are critical oversight issues that have to be factored in and properly addressed as deregulation goes forward.

I hope that in bringing you gentlemen here, that we have sensitized you to the NRC's issues and concerns, and those of you who are our direct licensees understand that and are as sensitive to it as we are to start with.

But I'd like to make a couple of comments relative

to each presentation that we've heard today.

With respect to the staff presentation, I think it's very important that we understand how the issue is to be addressed within our current regulatory context, understanding where we are and what we control versus what we do not, but how it is to be addressed in these issues of licensing basis, et cetera, and I've already spoken to the issue of the timeliness and the expeditiousness of your reviews, and I'm also going to be asking the AEO to arrange for each region to have someone come -- go to a power pool and a reliability council for that region to get themselves more informed than I think our staff currently is today.

On the federal level more broadly, it strikes me that there are parallel paths for the NRC and the interagency process doesn't always work as well as it should, and typically, when one agency goes to see another -- and we do the same thing -- we would say, well, of course, you know, if you want to be in, you're welcome to be in, but the way to really be in is to make the interagency process work and to have all the players, just as we've spoken about it in the broader context, at the table as the discussions go on.

And I'm going to be meeting with the Secretary at any rate and I'm sure we'll talk about this point.

I think that we will be prepared and I will be

prepared to speak to any legislation as appropriate within the context of our concerns that reinforce the ability to ensure that the issues are appropriately dealt with, including testifying if it comes to that.

And with respect to NERC and the other regional councils, I think the issue of -- the path that you're proceeding down seem oriented, but it all has to address these issues, but it really does have to be pulled together, and that your operating protocols and the training of people are, to us, very serious issues, and the compatibility of what you lay out in terms of operational criteria to nuclear power plant requirements and having some enforceability of that, I think, is a very important issue to us.

And then with respect to the industry, I think it's important that we have a clear understanding with respect to the extent to which you feel the various

operating protocols that are being developed in fact are compatible with the requirements on the nuclear plants, as well as getting input from you on how you think the issues can be addressed within the licensing basis or FSAR space since that is something that the Commission has under consideration at any rate as we go along.

And so unless there are further comments or questions from fellow commissioners, adjourned.

[Whereupon, at 4;25 p.m., the briefing was adjourned.]