UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BRIEFING ON GRID STABILITY AND OFFSITE POWER ISSUES

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Nuclear Regulatory Commission

One White Flint North

Rockville, Maryland

Monday

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The Commission met in open session, pursuant to notice. Chairman Nils J. Diaz, presiding.

COMMISSIONERS PRESENT:

NILS J. DIAZ, Chairman of the Commission

EDWARD McGAFFIGAN, JR., Member of the Commission

JEFFREY MERRIFIELD, Member of the Commission

(The following transcript was produced from electronic caption media and audio and video media provided by the Nuclear Regulatory Commission.)

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

Secretary

General Counsel

DAVID MYER, Senior Policy Advisor, DOE

DAVID NEVIUS, Senior Vice President, NERC

ALISON SILVERSTEIN, Chairman's Sr. Energy Policy Advisor, FERC

CHRIS CRANE, Chief Nuclear Officer, Exelon

CHUCK DUGGER, Vice President, NEI

SAM COLLINS, DEDO

CORNELIUS HOLDEN, NRR

RICH BARRETT, Director, Division of Engineering, NRR

MICHAEL CHEOK, RES

RONALDO JENKINS, Section Chief, NRR.

JOSE CALVO, NRR

P R O C E E D I N G S

CHAIRMAN DIAZ: Good afternoon and welcome to the NRC. Some of you are very familiar with us. And some of you, we are happy you're able to join us from , FERC, NERC and DOE.

At this meeting we will be discussing grid reliability and the potential effect on nuclear power plant safety. The Commission would like to thank our distinguished visitors for coming to share their views with the Commission.

Ms. Silverstein is here from FERC, Mr. Meyer from the Department of Energy, Mr. Nevius from NERC, Mr. Crane from Exelon and Mr. Dugger from the nuclear institute.

We would also have a second panel in which the staff will be briefing the Commission on this topic.

I'll take this opportunity to make a few introductory comments which will of course start with the events of last year in which grid reliability became much known topic due to the blackout on August 14th, without any doubt the largest power electrical outage in the history of the United States. More than 500 generating units shut down, nine nuclear power plants in the United States, seventh in Canada, automatically shut down due to the electrical transient. Four of the Canadian nuclear power plants automatically disconnected from the grid but were able to continue to operate at a reduced power level.

The joint task force, which you're familiar with, was established by the Department of Energy and the Minister of Natural Resources to investigate the causes of the blackout and to recommend actions to prevent future blackouts. I was, of course, a member of this task force and I was the co-chair along with my Canadian counterpart, Linda King from the nuclear working group. We thank the task force. Some of our

distinguished visitors today also work with the task force. The task force issued an interim report in November 2003 and a final report on April 5th, 2004. I really think we should thank all who worked so hard to finish this report, including our members of the staff in the NRC.

It was a big effort involving the large collection of a large amount of data and analyzing that data from all the effected power plants, the subsequent analysis of the data and integration into parts of the report. There was data collected from every nuclear power plant in the United States in order to judge the extent of the electrical transient. U.S. nuclear power plants that tripped were located in Ohio, Michigan, New York, and New Jersey.

Yet minor effects were experienced at nuclear power plants as far as south as Louisiana and as far west as Nebraska. The good news from this event is that the nuclear power plants responded to the grid transient in a manner consistent with the design of the plants and were maintained in a safe shut down condition, until conditions were met to permit them to restart.

The on-site emergency diesel generators supplied the necessary power for the safety equipment of the nuclear power plants until offsite power was restored. However, this event has raised concerns in different areas for several reasons. The fact that the blackout covered such a large area with several nuclear power plants affected and many other power plants affected meant that monitoring the status of these plants was more difficult for the NRC than any single event at a single power plant or two power plants.

Also, the fact that reliable offsite power was not restored for several hours at some of the nuclear power plants increased their concerns that we have with the risks associated with loss of power in nuclear facilities compared to a more typical transient where offsite power is restored within a reasonable or a short period of time.

The task force report gives several root causes for the blackout, system vulnerabilities -- we think the first energy control area in Northern Ohio had not been addressed properly. The failure to manage tree growth under transmission lines led to the loss of the first line and monitoring system problems resulting in transmission system operators not recognizing or understanding the deterioration of the system until it was too late for human intervention.

Although the final report from the task force contained a large number of recommendations intended to improve the reliability of the grid, the fact is that many or most of them have not been implemented, and it will take time to do so. The Commission, therefore, is interested in understanding the potential vulnerabilities of the electrical grid, and if additional regulatory action is needed to reduce the risk to nuclear power plants.

In essence, is there something else we should be doing that we are not doing? This can be a difficult area for the NRC to address since our licensees in many cases, do not have direct control over the grid. And the NRC does not have regulatory authority over transmission system operators.

Also, the nuclear power plants are already designed to cope with the loss of offsite power.

As a safety agency, we have to decide if our safety goals will be met or if additional regulatory action is needed. And if so, in what measure or in what manner. This

has led to many different views and actions to be taken, many of those you will be seeing today.

We will be hearing differing opinions. And that's what's good about this meeting. We also have many different opinions expressed. At this time, before I start with the panel, I would like to ask if my fellow Commissioners have any further comments?

COMMISSIONER MERRIFIELD: Mr. Chairman, I would make a brief statement. I thank you today for sharing what I think is an important meeting for us to review the activities that have occurred over the course of the last nine months in the work that you as well as others have done on the task force.

As you know, this is an issue that, in some respect, predates us. I know I was going back to a transcript Mr. Mayer had appeared before the Commission back in the '97 time period on many of the same issues regarding the impacts of the grid on the safe operations of the plants that we regulate. I'm also reflecting on the fact that on the morning of April 14th, I happened to have had an opportunity to have the folks from the electrical and I&C Branch come to my office to brief me on the reports of what they along with their counterparts in the Office of Research had done in terms of analyzing the impacts of the grid of the operations of the plants that we regulate. So these are important issues for us to reflect on today.

And as we are now entering into the summertime time period in which the risk profile related to the impacts that an outage may have on the safety of those plants is increasing.

I think it's very timely that today we reflect on what our staff has done and will be doing this summer to hopefully lower the profile that we had identified at that time period

as being somewhat higher than originally anticipated. So Mr. Chairman, I thank you and look forward to the testimony of all of our witnesses today.

CHAIRMAN DIAZ: Thank you, Commissioner Merrifield. And with that as an introduction, I'll first round the first panel to its proper conclusion.

And then the Commission will ask questions, at which time we will then introduce the second panel.

So I'm going to start with Ms. Silverstein from FERC. You have the mike.

MS. SILVERSTEIN: Good morning and thank you for inviting us. My Chairman, Chairman Woods, sends his regards and his apologies for being unable to join you himself.

Since you have already done a superb summary of the blackout report and its findings, I will skip my first slide entitled "Blackout Report Findings" except to note that there's a typo on it and apologize for it. It appears that, thanks to those difficult human computer interface issues that highlight the importance of cyber security, my computer thinks the blackout occurred on August 14, 2004, rather than 2003. And let this be a lesson to us all in the importance of not just letting computers get away with stuff. I will turn to slide three, please, about nuclear power plants and the grid.

As you all are well aware nuclear power plants need a consistent, reliable grid in order to feed their power into the grid and as you have noted to rely on for safe shut down. The grid, of course, needs the nuclear power plants to provide power, both energy and capacity, in addition, for reactive power and voltage support. The heart of your question is, is the grid reliable enough to meet the safety needs of the nuclear power plants?

And I think my colleagues here will agree with me that the grid is very reliable, almost all of the time. But it's the times that its not that concern all of us. 8/14 and prior blackouts teach us that the best way to assure reliability is to take care of the basics and prevent big blackouts by preventing little blackouts from ever starting and managing small problems and local issues before they turn into big issues. I think that's the lesson from the August 14th blackout.

One of the things that I would encourage you all to do is to invite NERC, FERC and the Department of Energy to work with you on identifying and better quantifying the probabilities and risks of local and regional blackouts. I understand that you're doing a great deal of probabilistic assessment and risk assessment. And I think that you have a great deal of expertise within these agencies and organizations that can help you within that effort.

Certainly, FERC is ready to support you. I would like to acknowledge that I've brought with me two staffers from FERC who helped contribute to this and will help me to answer any of your questions. They are John Kueck over there, who's joined FERC reliability staff from the staff of the Oak Ridge National Energy Labs. He was the Chairman of the IEEE committee that developed Standard 741. He's currently working on the IEEE subcommittee for auxiliary power systems.

And he worked for Carolina Power and Light on both the Harris and the Brunswick plants. And some years ago, worked with your staff on a study of the effect of offsite power reliability that occurred in '96 '97, and was published in '98. Also with me is Bruce Poole who joined FERC a few years ago but came to us from Oak Ridge National Labs Reliability Group and worked on the TVA nuclear power program and helped to

design and build the SouthTexas power project. We were fortunate enough to be able to line up a couple of ringers to help us contribute to your thoughts here.

Our recommendations for the nuclear power plants are very specific. On page 5, the most important is to make sure that the control area and the reliability coordinator operating the grid around your plant, very clearly understand every plant's unique voltage needs.

And we do understand that they are unique. In particular, each nuclear plant should be asking its reliability coordinator and its control area for updated voltage studies to determine the grid capabilities and the potential threats. It became very clear that one of the root problems for the August 14 blackout is that there was insufficient understanding in the North Ohio area of what the regional reactive power capabilities and problems in voltage issues of that area were.

And it appears, from what we asked about at the nuclear plants in the northern Ohio area and in other parts of the country, it's not clear that competent, appropriate and updated voltage studies have been conducted that can help to support and give your plant operators and yourselves an adequate understanding of whether the grid can support a normal day-to-day operation, much less emergency operations, the needs of a nuclear plant.

Once such studies have been conducted, it's critical that specific grid operating limits and protocols are designed around each nuclear power plant's voltage needs and that those be clearly understood and internalized within every transmission operation control room. That's a preparedness issue. Another one is situational awareness.

Situational awareness, as you noted, sir, was critical as a part of FirstEnergy's problems and also part of the reliability coordinator's problems on August 14th. We believe that the nuclear power plant should have significantly better situational awareness about potential grid problems in the same way that the grid managers should.

This may mean they need better access to key real-time data about the grid, better sharing of grid condition data, including potentially state estimator or contingency analysis results so that as conditions on the grid change in real-time, they can see any worrisome findings that are in minus 1 and minus 2 possibilities that occur next. Most important, we need effective communication protocols between the plant control room and the different transmission operator control rooms.

One of the best effective ways to ensure cooperation is to get it on paper. And we have two recommendations for you. The first is that we think it is essential that there be contracts between the nuclear power plant, its transmission control area, its transmission operator, and or recognizing that the transmission operator, the control area, are not always the same thing.

And many areas of the United States have reliability coordinators that are calling all of the shots, even if they are not actively controlling every single nuance of the grid in real-time.

So we think contracts should be created between the nuclear power plant and the grid operating entities to identify and establish clear accountability and responsibilities for all of these actions and interchanges. If it is necessary, FERC will be ready to work with you and the power plant's needs to develop a tariff that is appropriate for the control area or the reliability coordinator. It is our expectation that some of the

needs of the nuclear power plant go beyond the normal expectations and arrangements between a generator and a control area operator or a transmission operator.

And this may require additional costs or activities. Those should appropriately be reimbursed to the degree that they are causing additional burden.

In terms of protecting the nuclear power plant, it's clear that the voltage at the interface between the plant and the grid must meet a significant and specific set of needs for the nuclear power plant.

But it's not clear to us that it requires the entire grid. Of course, for safety purposes, the more grid the better. But it's not clear to us that you need the entire grid behind you.

It could be that you want to start designing a strategy that has as a back up, the capability at the interface or right next to it, that you have specific plants that are designated or fast start that are turned on purely on days when additional voltage support or backup is necessary to provide a backstop for the grid for the nuclear power plant.

So we suggest that you re-examine the requirements and think about how much, how long, and how fast is protection needed and at what times.

And again, do you need the full operability of the grid all the time or do you need this additional kind of backstop mechanism from local voltage support close to the interface?

I don't know if it is an industry joke or if it is a truism, but once upon a time it used to be said that the safest nuclear power plant was the one next to a hydro plant. We can't all put hydro plants next to our nuclear plants but it would be nice to have something that is parallel to that in more locations.

As a last recommendation, we strongly advise that you look at cyber security. There's clearly a mutual vulnerability between the grid operators and the plants with respect to cyber security. I know that your agency has taken some initiatives on cyber but we strongly urge you to require nuclear power plants to adopt and implement NERC Standard 1200 for plant EMS protections and that the provisions of that which will be updated into permanent NERC Standard 1300, should be observed and adopted as well.

At this time, there's no requirement that nuclear power plants comply but we do believe this would significantly improve the security profile of the nuclear power plant and reduce its vulnerability from the grid and vice versa. That will provide better protection for both the grid and the plant. Thank you very much.

CHAIRMAN DIAZ: Thank you very much Alison for a very good presentation in the right period of time. You've set a standard that I'm sure I'm going to be asking the rest of the panel, throughout the afternoon, to emulate.

With that, Mr. Nevius?

MR. NEVIUS: Mr. Chairman, other Commissioners, staff, guests, thank you for the opportunity to appear here today to talk about this very important and timely subject.

NERC's mission, of course is to ensure that the bulk electric system in North America is reliable, adequate, and secure. This is a critical issue for all electricity customers. But for none so critical as the nuclear power plants depend on the grid as a source of reliable offsite power. I've submitted some prepared remarks which I hope that you will consider and include in your record. What I would like to do this afternoon is to talk about three things, the importance of good communication and coordination between the nuclear power plant operator and the plant's transmission system operator.

And Ms. Silverstein has already eluded to that. Second, the value of developing a memorandum of understanding between NERC and the Nuclear Regulatory Commission where we can work together more closely.

And finally, the urgent need to enact reliability legislation.

First in the area of communications and coordination, we support the statement that appears in your regulatory issue summary on grid reliability and the impact on plant risk and operability of offsite power, regarding the importance of effective communication interfaces between the plant operators and the transmission system operator.

In fact, NERC, and the Nuclear Energy Institute collaborated several years ago on an industry workshop to raise awareness on this very issue.

Secondly, as part of our readiness audits of all control areas and reliability coordinators, NERC is specifically addressing the issue of communication and coordination between plant and system operators through a series of questions posed to the utility's management, their system operators, and system planners.

These questions were based, in part, on some suggestions given to us by your staff that we added to our audit process. We appreciate their input on this.

The first report that has been formerly posted is that of the Florida Power and Light Control Area Audit. It's in final form.

It serves as a formal source of information to the Commission on how these communications and coordination issues are being addressed in that utility. Reports of the other audits that have been conducted so far will be posted as soon as the reports are finalized. They should provide some greater assurance to the Commission and others on

the nature of these communication and coordination arrangements at all utilities that serve nuclear power plans. From my review of the preliminary audit findings of those reports that are not yet posted, it appears that interface agreements and procedures are in place. We need to certainly scrutinize these procedures to see if they can be improved. But I'm pleased to say so far we've seen some good results. Key plant voltages are being monitored in real-time and through contingency analysis programs.

And the plant and system operators are communicating regarding changes in the status of things inside the plant and out on the system.

We'll complete by the 30th of June, the audits of at least the 20 largest control areas in North America as part of our three year cycle of readiness audits. I would commend to the Commission to review these reports as they are finalized and work with us to ensure that our audits are adequately addressing your issues and concerns.

In the future, we may consider developing a specific standard that would require these agreements and procedures to be in place and reviewed periodically as part of the NERC Compliance Program.

Second point on the NRC NERC MOU. NERC and your staff have held a number of informal yet very productive meetings over the last five years or so in which we've shared general information on grid reliability issues and to discuss NERC's assessments of upcoming reliability for the upcoming summer and winter and for the longer term. These dialogues should definitely continue. But I think we should also consider establishing a more formal understanding of how our two organizations can communicate and cooperate in sharing of information on grid reliability in general and specifically on the analysis of events that occur on the grid that have impact to nuclear power plants.

We have an MOU with the FERC that we are currently updating. We plan to update one with DOE and we've discussed with INPO the possible of creating a MOU with them as well.

In the analysis of the August 14th blackout, NERC and NRC staff engineers were unable to directly communicate and share information and analysis critical to our respective investigations. I think in the future we need to look at better ways to handle that. The arrangement that we had was not as efficient as it could have been.

Having staff engineers on site would have been in my personal opinion, a better choice under the circumstances. We did get through. We did eventually share information by way of an agreement, passing it through David Meyer from the Department of Energy. But it certainly complicated our analysis. And I suppose it complicated your staff's analysis as well.

Through an appropriately crafted memorandum of understanding, I think we can better cooperate and share information on these kinds of event analyses and in general, on issues of grid reliability.

Lastly, on the issue of reliability legislation: Since NERC was formed in 1968, we've operated quite successfully as a voluntary organization relying on reciprocity, peer pressure and mutual self interest to follow the reliability rules. Through this voluntary approach, we've helped make the North American bulk electric system the most reliable in the world. While we hope that a blackout of the magnitude that happened last summer would never happen again, there is no assurance that it won't.

The consensus of the industry and government alike is that the best way to ensure grid reliability going forward is by establishing an international industry based self

regulatory organization to set and enforce those rules for grid reliability. There's broad agreement on specific language to accomplish this, which is currently part of the comprehensive Energy Bill, H.R. 6.

Unfortunately, that's been the case for about the last six years. That is, that language in one form or another has been in every comprehensive energy bill and we still don't have reliability legislation. Without it, it's not a question of whether there will be another blackout but when.

I urge the Commission to lend its voice and its support for enactment of reliability legislation now. Without the legislation, there will be a temptation to use existing regulatory mechanisms and other mechanisms to perform a task they really were not designed to do, which could lead to an ineffective and undesirable arrangement.

Thank you very much for having me appear here today and I look forward to your questions.

CHAIRMAN DIAZ: Thank you very much. The standards are upheld. Mr. Meyer?

MR. MEYER: Thank you, Mr. Chairman and other Commissioners. It's my pleasure to be here to talk about these issues today.

The particular issues pertaining to what I would call the interface, the relationship between nuclear power plants and the grid, there are obviously questions related to that interface that need attention here.

But it will be important going forward to ensure that attention to that interface takes place within the context of this broader set of recommendations that we have developed that is intended to create a stronger framework for reliability in this country going

forward. So I won't talk about all of our recommendations, but I'll focus on some of the critical ones. Mr. Nevius has already mentioned the importance of the legislation.

And I want to say it's not that there are not things that we can't be doing in the absence of the legislation. But in many respects, there is no adequate substitute for that legislation.

The recommendations package that we came up with is truly, I think, synergistic in a lot of ways. There are elements that fit together there to establish a structure that we regard all parts of this structure as quite important.

So I'm on the third page of my slides, starting with the twenty key recommendations, the first of which is to make compliance with standards mandatory and enforceable.

The second is to improve the funding arrangements for NERC and the regional councils, to ensure that funding is adequate and these organizations are not unduly dependent on industry sources. It also strengthens the institutional framework for reliability itself by coming up with improved metrics for reliability performance, a criteria for the selection of NERC's board and reassessment of the role of regional reliability councils, just a number of institutional questions of that kind where we see improvements being needed.

We are very aware that reliability will not be maintained without significant additional investments. So it's important to clarify that prudent investments will be recoverable through transmission rates.

And FERC has already addressed that in a recent policy statement.

So we are making good progress on some of these things.

NERC and DOE and FERC are working collectively on ways to systemically track these recommendations.

The evidence from past blackouts makes it very clear that follow through is critical here.

I won't go into the details about things that are being done to address the direct causes of the blackouts. I think that the reliability readiness audits that Mr. Nevius has talked about are critical here.

In the interest of time, I won't go through all of these. But I do want to emphasize the importance of training that was -- the training issues were very clear in our analysis of the events of August 14th.

And the need to more clearly identify the responsibilities of reliability coordinators and control area operators under alternative operating conditions.

We found that, if you look at the transcripts from August 14, it's very clear that there was not a sufficiently clear understanding of who was responsible for what under the conditions that were obtained that day.

Again, in the interest of time, I won't go down through all of these. But the point that I do want to get across is the sort of breadth of this set of recommendations, that we sought very much to identify all of the major weaknesses in this system and to address them effectively.

And so it's in that sense that I want to come back to the point about this issue of the relationship between the nuclear power plant and the people who are responsible for planning and operating the grid, that there is an essential conversation that has to go

on, not just initially but it has to be an on-going one between the plant operator and the people who are responsible for operating the grid.

So those kinds of issues have been described adequately or described very well by Alison earlier.

So with that, I'm going to -- I will make one more point about -- on the very last slide, that the U.S.-Canada Task Force has been extended for one year to provide oversight for the implementation of these recommendations.

And we don't intend to focus exclusively on the things in the set of recommendations when new information comes forward as from this meeting. I think it won't be difficult for us to give attention to some of those kinds of concerns as well, because we are going to be in a constant mode of calling some of the critical parties here and asking for an update of what have they done to address some of these issues? And we'll be going down the list, item by item with them. And so some of the things that are of concern here, I think, can be factored into that discussion.

CHAIRMAN DIAZ: Thank you, Mr. Meyer.

I think that was also a very good summary, and issues that we all take very seriously.

With that, we'll going to switch now and bring in the ones who are on the receiving end of offsite power and also at the giving end of a good chunk of reactive power. So with that, Mr. Crane?

MR. CRANE: Thank you, Mr. Chairman.

I'm going to give you and the Commissioners a brief overview of what Exelon Corporation is doing in two areas. One is the electrical distribution company. The other

is in our electrical generation company which I come from. As far as the electrical distribution area, the organization has performed a self assessment based off of the interim report from November of 03 that follows within the five major focus areas that the report was written in, very consistent with all of our peers and benchmarked that way.

We came up in the energy delivery area with 40 short term and 60 long-term actions within these areas. A major focus for us ended up being in the operator training area, and communications area, to continue to grow in those areas.

The nuclear organization has been a part of the self-assessment that was performed and is continuing to be a part of the review of the final report that had been issued and the actions to be taken.

As far as the nuclear focus, we continue to work diligently on, not only our own plant reliability but the reliability of the switch yards and the interface through the transmission company.

The first area that we focus on is summer readiness. We have a seasonal readiness program, either for the summer or the winter. But it's set to drive the organization to look at vulnerabilities, ensure training has been performed.

We have the SOER 99-01 actions that I'll speak a little bit about the INPO SER and the communications interface between the electrical distribution company and generating company.

The first area, summer readiness, we did take the lessons learned from the 2003 event and enhanced or confirmed our actions.

One, as I said, that was a major area was the operator training on grid instability. We had done quite a bit of work for the Y-2K and the black restarts fast turnarounds in the plants. We had put that into our summer readiness program.

But we have done quite a bit more since the review of this. Table tops, practicing fast plant turnarounds.

Each team -- or each site has a weekly duty team that will review what's on their plate for degraded equipment. If a unit came down, what has to be fixed, make sure that everything is staged to do it, to be able to expeditiously but safely return units to power. And we verify our communications and continue to test it under a loss of power.

All of our site vice presidents, senior executives at the site go through this detailed procedure with their site, checklist and have to provide to myself certification letters that review the system readiness, they review the switch yard readiness, the outage plans, and the contingency plans.

The Dresden Station last week was a test case. We would rather have done it in a simulation form than the one we did perform it under.

What we were working on in the Dresden switch yard was doing some testing and making sure that a new substation near the plant was ready for the summer load and the reliability was there.

We had contingency plans in place for that one maintenance activity. It was high risk in the switching. We were down to a single output breaker. Control room had been briefed, operators had been briefed, system operators had been briefed that there is a potential to trip the plant at that time.

The plant did trip on a malfunction of a component. That component or that malfunction is going through a root cause and is giving us much more insights on the maintenance practices or the level of detail that our energy delivery organization goes through versus what the plant maintenance standards are.

So we'll try not to test ourselves much more on that area.

Transmission providers all provide certified summer readiness. We own the majority of the transmission lines out of our plants. Our Amergen sites are serviced by other transmission companies, and we work with them and have a understanding or memorandum of agreement that they'll certify the same as we do in our own facilities.

As far as the SOER 99-01 which INPO issued -- and I think Mr. Dugger is going to provide a lot more information on that -- we have insured that the plant, the operators and the station procedures are all under the guidelines of 99-01 and perform annual self assessments for those activities.

The one thing to point out is the validation of assumptions for grid reliability and stability are validated. We have an annual requirement where our transmission companies provide to the site the updated grid analysis to make sure that all of our under voltage assumptions made for our safety system, safe operation, are valid or changes will have to be taken to compensate for that.

Under the area of communications and interface, this has been a major focus for our company and for the companies that we interface with at our Amergen facilities. We've set monthly executive meetings between the distribution and the nuclear generating company.

We review in those meetings outstanding design issues. We have, within our own fleet, found the operating experience about some specific design issues that have to be resolved or we take the EPICs that come through the industry and we keep that on our list to resolve. We look at equipment reliability issues, like this failure at Dresden on the breaker, like how did it happen and what do we do to fix it at the other stations before it happens again. We talk a great deal about operator interface and issues that we have within that area.

One of the main focuses is to improve the communications between the distribution operators and the nuclear duty officers on all the sites. We have a very mature relationship and communication standard within the plants that are in PJM.

Our other plants in the northern Illinois operating area have just gone through a transition to PJM. So there's a major change management effort underway to understand the communications with the system or the area controllers and also the dispatchers out of PJM.

It added one more level for our control room operators to understand in the northern Illinois area. So we'll be working through that.

One of the issues that we found in our more recent evaluation of the grid through the self assessment, in our annual assessment, is the statewide estimator for the Illinois operating area was in service but there was not clear communications taking place with the nuclear sites in that region. We have now remedied that. We are continuing to proceduralize that. Voltage threshold are understood. Alarms are received in system operations. Systems operations is required to call the control rooms and to notify the

control rooms to make whatever actions necessary to adjust reactive load or just be aware of the situation for potential contingencies.

Compensatory actions have been put in place and are being further developed based off of some questions that are arising on how far do we go and what does the unit do in emergency situations. I don't think we have the answer right now that says anything besides follow your tech specs. And that's what all of our operators are trained for.

There's been conversation within our distribution company of, is there any latitude because of degrading situations that we may make the situation worse by following the tech specs? I'll assure you that we will follow the tech specs today but it is something that I think there will have to be more discussion on and more understanding of how not to worsen the issue based off of stripping the unit under those conditions. We do have project plans developed for all the activities to continue to enhance our switch yard reliability and our substation and transmission across the energy delivery system and the generation system.

One major material condition upgrade that we are looking at on our Illinois plants, the old ComEd facilities, are auto tap changers. Our plants in the PJM region in the Clinton facility already have those. The five operating sites, the 10 reactors, the old ComEds, do not.

And we think that the way the growth is in the area, and the controls coming in place, we'll have to expedite that to better support.

And there are some other material condition issues that we are prioritizing just like this. So we believe that we have a fairly robust program to go through to address

the issues of August of last year, the interim report, and the follow up on the final report and continue to strengthen not only the communications but the robustness of the yards and the readiness of the facilities if we were to be afflicted by another blackout.

CHAIRMAN DIAZ: Thank you so much, Mr. Crane.

And I agree with you that simulation has its advantage over the real thing. We appreciate your efforts in that direction.

With that, let me allow Mr. Chuck Dugger from the Nuclear Energy Institute bring another overall perspective from him viewpoint as Vice President of Operations at NEI.

COMMISSIONER McGAFFIGAN: Mr. Chairman, I do want to state for the record, Mr. Crane was chosen before last week's events and I don't want the reputation to go out that we're like "Sports Illustrated" cover picture -- that getting summoned to a Commission meeting is a bad omen.

CHAIRMAN DIAZ: Let the record show.

MR. DUGGER: Well, good afternoon, Mr. Chairman and Commissioners.

I want to thank you very much for this opportunity to share the industry's views on activities related to the grid prior to and following the August 14th 2003 grid disturbance.

If I could have slide number one, please.

Electric utilities that own and operate nuclear generating facilities have been addressing grid reliability and switch yard issues for many years. We started with original design criteria 17 and it's progressed through the blackout rule in 1988 accompanied by the NUMARC document 87-01, issued in 1991; followed by SOER 90-01 that addresses

switch yard activities. And then the maintenance rule in 1991, accompanied by NUMARC 93-01. SOER 99-01 then came out that addressed loss of grid and SOER 2003-01, addressing emergency power reliability.

And there been many more generic letters, SOERs, and information notices addressing various issues associated with offsite power to nuclear power plants. Of course, we don't have the time to cover all of those. I have selected just a few to be a representative of the activities that nuclear power plants have engaged in addressing grid switch yard, and emergency power reliability. And of course there's a couple of conclusions that I would like for you to draw from this.

The first conclusion would be that responsibility for grid reliability and stability clearly lies with the Federal Energy Regulatory Commission, FERC and with the North American Electrical Reliability Council, NERC. And the second conclusion is that the industry has been engaged with this issue of grid stability and reliability and has demonstrated positive results and therefore additional regulation is not required.

Let's first look at SOER 99-01. And if I may have the next slide, please.

The Institute of Nuclear Power Operations has performed two cycles of evaluation on nuclear power plants to ensure actions have been taken based on the recommendation of SOER 99-01.

And the recommendations are really germane to our discussion here today. The recommendations include to establish appropriate interfaces between nuclear power plants and grid operators, such that planning for plant safety system maintenance and testing activities that could affect electrical supply diversity is coordinated with the grid

maintenance and testing activities to prevent inadvertent reductions of nuclear plant defense-in-depth.

The second is plant operators are provided early warning from grid operators of potential and developing grid instabilities.

And the third is, grid operators are apprized of unique plant operating restrictions and requirements associated with operation of nuclear power plants with respect to nuclear safety.

Number four is, the nuclear unit is clearly recognized as an important load from the nuclear safety perspective. This relationship should be reflected in grid load shedding schemes.

And the fifth is, the responsibility and ownership for grid equipment maintenance is clearly defined between plant and grid operator.

The SOER goes on to recommend that review of adequate procedures for loss or degradation of the electric grid to ensure that actions to be taken in the event of grid instability and voltage degradation are specified, including criteria for preemptively placing safety systems on emergency power supplies for conservatively placing the plant in safe operating or shutdown condition when significant threats to grid stability exist.

And clear guidance exists for manual configuration of electric buses when automatic transfer features fail to actuate or when manual alignment of emergency power is required. And that operating procedure guidance reflects the importance of timely resetting of safety system electrical sequencing equipment following return to the grid. And that management expectations clearly communicate that following a loss of grid involving

a plant transient or trip, that the operating crew's immediate focus should be on stabilizing the plant into a safe condition rather than on rapidly returning to power operation.

The SOER continues on to say that verify that the plant and switch yard high voltage distribution equipment, for which the plant is responsible, is fully incorporated into the plant preventative maintenance program and verify grid reliability and stability design, assumptions remain valid, as Mr. Crane pointed out. And incorporate the degraded voltage conditions into operator training in addition to just the complete loss of grid training. INPO reported on the status of the implementation of SOER 99-01 recommendations at a recent NRC public meeting. They reported the implementation as essentially complete.

May I have the next slide please. Through SOER 99-01, you can see that the industry has spent a great deal of effort ensuring their coordinating their activities with the grid operator. Earlier I referenced 90-01. Many of the recommendations of SOER 99-01 are covered and reflected with 90-01.

Now, let's turn our attention to another SOER and that's SOER 2003-01. This SOER addressed emergency power reliability. Because of the problems identified at plants domestic and in the United States, a series of recommendations went out to all nuclear power plants and will be evaluated by INPO.

These evaluations began in June of 2003. And the recommendations were: Review existing emergency power system designs for vulnerability to common cause and common mode failure. Do the same thing for reviewing existing emergency power system operating and maintenance practices, and the same for modification processes.

And, review performing monitoring -- performance monitoring practices for emergency power systems to ensure current practices identify degrading performance of

components. Review testing practices and finally, review maintenance practices to verify that both contract and nuclear power plant personnel are performing maintenance on emergency power systems, that they are closely supervised by appropriate nuclear plant supervisory staff, briefed on the work package requirements, and allowed work scope, and understand requirements to clearly document work performance.

Now, I went through this in such a detail to give the Commission a feel for the depth of our review and actions implemented to ensure good coordination of the power plant with the grid operator, and our desire to ensure we have a robust emergency power system to provide the needed backup, as they did in the August 14th event.

The NRC staff will be verifying many of these actions through temporary instruction 2515/156, recently issued to the resident inspectors. May I have the next slide, please?

The industry is engaged in a review of all loss of offsite events. There are always lessons to be learned and changes or adjustments to be made to programs. And you've heard some of the changes that Mr. Crane mentioned earlier.

The Electric Power Research Institute publishes a report on the loss of offsite power events.

Frank Ron of EPRI delivered a summation of that ongoing review at the public meeting of March 4, 2003, between stakeholders and the NRC. In that presentation, the probability that a U.S. nuclear plant would lose all offsite power to safeguard buses some time during the year was presented in graphic form. Since 1980, the probability has dropped by nearly a factor of ten, demonstrating that actions taken by utilities have been effective.

Nevertheless, we continue to assess the switch yard grid configuration risk management practices, and continue to review industry data. We are involved now with the NRC Office of Research to come to an understanding of terminology and treatment of data to ensure we fully understand the implications of data collected by INPO and through LER's.

We've recently formed an industry task force through NEI. This task force is made up of industry representatives with interfaces with INPO and NERC. Through the task force, we have performed a survey of recent loss of offsite power events and their impact on plant license design basis. We'll provide the results of that survey to NRC staff within the week.

The preliminary results of the survey demonstrate that units that have experienced a loss of offsite power since the adoption of the station blackout rule, remain bounded by the assumptions made in their coping analysis, with one potential exception which is Turkey Point during the Hurricane Andrew event.

The task force will continue to monitor NERC activities and comment as needed to make sure that the special needs of nuclear power plants are recognized in the standards issued by NERC.

The task force is already engaged with the staff in a review of current regulation to ensure the regulation is adequate with the changing environment and generation and transmission and distribution for regulated and deregulated utilities and power plants.

Now, earlier, I indicated that I would like you to draw certain conclusions from this presentation. And they were; one, responsibility for grid reliability and stability clearly lies with FERC and NERC.

And two, the industry is engaged with issues of stability and reliability of the grid with positive results and additional regulation is not necessary.

You can clearly see the industry's engagement with the grids switch yard issues through the design criteria 17, blackout rule, maintenance rule, technical specifications, and beyond through the various SOERs, where we recognize the value and need for additional levels of communication and coordination with the grid operators.

The results of this engagement has been demonstrated positive. You can also see that the individual plants have gone about as far as they can go trying to control their own destiny through ownership of switch yard equipment, preventive maintenance and configuration risk management.

There has to be a line drawn where the grid operator takes responsibility. And we think, through our programs and agreements, that that line is clear.

We also believe that it is right and required to revisit existing regulation to ensure it is still providing the right direction for the industry. And we are prepared to engage with the staff in that effort.

I would like to respond to one remark from our colleague from FERC.

We do not believe this special regulation for nuclear power plants with respect to cyber security should be applied without addressing all of the rest of the generation. The responsibility should be with NERC and legislation providing the right authority for that legislation.

We have developed a draft NEI guideline at this time, through our cyber security task force that would meet the NERC requirements. And that draft guideline is available to our power plants for application today.

But we have not sent that out as anything other than a draft at this point. And I want to thank you for the opportunity to address you.

CHAIRMAN DIAZ: Thank you very much, Mr. Dugger. We appreciate the panel's crisp and clear presentations. And once again, different views provide the Commission for a lot of thought.

And we also want you to be aware that we changed the order in which we start questioning. And today is Commissioner Merrifield.

COMMISSIONER MERRIFIELD: Thank you very much, Mr. Chairman. Hopefully I can be as crisp and clear as our panelists so far.

I do want to start with a comment. You did comment earlier, Mr. Chairman, of how the plants that were challenged on August 14th did operate as designed and did shut down safely.

I think one of the things that was not as evident and I think it's worth repeating at this point is that the rest of our system here at the NRC worked very well as well. I know you were out of town at that point. I was acting Chairman. And I do want to represent publicly my appreciation for what I thought was a terrific job on the part of our staff and the very good level of communication that we have with our licensees as well as our federal, state and international counterparts in that regard.

Turning to Ms. Silverstein, the question I would have for you goes to your slide 8, relative to the voltage at the nuclear power plant at grid interface. And sort of a questioning of what we need and how fast and all that.

I think as an agency traditionally we have long rested on our defense-in-depth approach with the recognition that we would want to have multiple sources of offsite power coming on to the plant. I think you're raising some questions for us that, perhaps, cause us to think more outside of the box.

But I'm wondering if you could give me a little more meat in terms of some of your suggestions on this particular slide.

MS. SILVERSTEIN: If I may, I would like to call on John Kueck from our staff to address this, please.

MR. KUECK: The point that I think really needs to be made is that having the nuclear power plant develop a very detailed and thorough understanding of its voltage needs, I think that point, as the representative from NEI has pointed out, and certainly as your own staff members will point out, those needs have been very well developed by the nuclear power plant. What needs to be supplied and how fast.

The concern that we have is the understanding of those needs by not just the transmission operator or what we have heard as the grid operator. Because with restructuring, there has been a change in responsibilities. And it's a change that's continuing.

And the transmission operator is often just the sub-transmission operator. He might have responsibility at 120 KV and below, but the transmission above that is under

the responsibility of the control area. And the reliability coordinator has the overall responsibility for the grid reliability.

I have had the honor of participating in many of the NERC audits that have been conducted. And I'm not able to provide specific names of plants or areas. That's something that we had to make a pledge of secrecy on these audits.

But I can tell you that there are some plants in some areas that have tremendous procedures for addressing these interfaces, that had the answers in advance to the questions in the audits.

And there were tremendous procedures and alarms and communications set up for conveying the information back and forth from the control area operator to the plant.

There are other control area operators, however, who feel that the voltage at the nuclear power plant is the responsibility of a different entity. Let me put it that way.

And that entity has not communicated with the control area operator. And the control area operator isn't aware of the specific needs. And neither is the reliability coordinator in some cases.

That's our concern here.

MS. SILVERSTEIN: If I may, Commissioner. We have gotten two different issues involved in this question. I would like to address both, if I may.

With respect to slide 8, the specific thing that we wanted to suggest is not only do you need the entire grid, but in addition the more that we can do to -- the issue is, do you need the full grid at every moment or when the full grid is not potentially available, can we fool the nuclear power plant into thinking that the full grid is available by putting enough functionality near the interface to make it appear as though enough of the grid is

available to meet the power plant's needs. Which is, for instance, my reference to the safest nuclear plant is often the one with the hydro plant next door.

There may be things -- Mr. Kueck was telling me earlier about how Carolina Power and Light had a couple of fossil plants close to their nuclear plants that they would turn up on hot days or high load days, specifically when they knew they might have a chance of needing those for voltage support or additional support for its nuclear plant protection.

There may be a number of different ways and technologies that can be used to provide that additional backstop and to fool the plant and its safety things into thinking that the entire grid is there to meet its needs are met, even if it isn't already. We just encourage you to think about those.

The other thing that Mr. Kueck was referring to was an issue raised by both Mr. Dugger and Mr. Nevius. And I would like to, with all due respect, address it.

COMMISSIONER MERRIFIELD: Very briefly, only because I have got questions for our entire panel. And I am trying to keep the Chairman's -- I think we have got a fifteen-minute question slot.

If you would like to put that in the form of a written response, I would be certainly pleased to have the Chairman include that in the record. But I have only got ten minutes left and I have got four more people.

I would say, as sort of a response, it's a lexicon that we use in our Commission versus the one that you use.

Fooling a nuclear power plant is something we would be really nervous about using it. You are making a very good point.

I think one of the things that comes out of this whole endeavor and the engagement that your boss and the Commissioners at FERC have had with the NRC lately, is the notion that we need to be more collaborative in our approach. I think that's a good thing that comes out of all of this.

Mr. Nevius, you have raised three issues. I think on the first one, you know, as a Commissioner, I would have to say that the notion of our having an MOU with FERC doesn't raise any problems with me. It sounds like a good idea. I would challenge our staff to engage on that as is appropriate.

You talked a little bit about the need for better communication between the plants and the grid operators and better coordination.

And I'm wondering if you can -- that's an issue that traditionally isn't something that we are as attendant to as a safety regulator. I'm wondering if you can put a little more on that particular issue?

MR. NEVIUS: Sure. I think it's the same issue that Ms. Silverstein was alluding to, and that is do we have the necessary interface agreements in place, procedures in place and well understood and executed so that the plant operators and the system operators know what each other's needs are, the condition of the system, so that they can operate the bulk electric system to provide the most reliable grid and reliable source of offsite power to the nuclear power plant. So that if the nuclear plant were to trip, the voltages will be adequate.

Whether that means having additional reactive support locally, turning on an additional plan to provide greater support, coordinating when the outages of a diesel are

necessary and the outages of a transmission line. You don't want to take a diesel out for maintenance when you have a line out for maintenance.

So having the two operators talk with each other and understand this. Many utilities have codified this in interface agreements. CALISO has a transmission control agreement. They go by different names.

But these are the interface agreements that say how the plant operator and the system operator need to coordinate and communicate so each knows what is going on in the other's bailiwick.

COMMISSIONER MERRIFIELD: I'm just wondering, though -- that's a very fine point. I'm just wondering, again, as a safety regulator, where our specific footprint is on that, where there is a role for NRC, engaging with our licensees in that regard?

MR. NEVIUS: I think the role of the NRC is to understand what the grid operator and the grid regulator, if you will, whether it be FERC or NERC, if the legislation or when the legislation is enacted. I think that it's incumbent upon the NRC to understand what that grid regulator is doing and how it is doing it.

I would like to see NERC have standards that specifically address what needs to be included in these interface agreements and how they need to be implemented.

We are finding that how the utilities are doing that now as we go around and do these readiness audits. One of the results of those audits will be likely that we need additional standards or guidance in these areas. NEI is already addressing some of it in their draft document that Mr. Dugger alluded to.

COMMISSIONER MERRIFIELD: Well, again, I think probably further recognition of the need or having a better relationship between our agency and your group.

I would say as far as your last comment, I'm sympathetic with the fact that it has taken six years so far. I was reflecting on what we think are some very necessary enhancements to our security authority as an agency. And we are 13 years and counting, despite 9-11. So I feel for you in that regard.

Mr. Meyer, I think, probably more of a comment, one of the items you listed in your presentation was the need for more realistic training. And I think you sort of alluded to, perhaps, simulator training.

And I have to say that I really would pick up on that one. Clearly, given the outgrowth of what happened with Three Mile Island 25 years ago, I would have to say that the work that the utilities have done through INPO and our requirement have simulators at all the plants, combined with, I think, a lot of intensive work by our agency to oversee that has really been one of the key issues of reducing a lot of the concerns and repeatability of the issues we have had.

So I guess I would have to say there's a lot of very key recommendations here. That's certainly one that I want to second.

MR. MEYER: One of the things that jumped out at us was that you want operators who are trained to cope with emergencies. But you sure don't want to be depending on on-the-job experience for them to get that kind of experience and training. So the only way they are going to get it is through realistic stimulation. And it's essential.

COMMISSIONER MERRIFIELD: Clearly -- and this is a case with the plants as well -- hopefully the occurrences will be so rare or nonexistent that simulators would be the place where they would see it. Otherwise, they wouldn't elsewhere.

Mr. Crane, you talked a little bit about the summer readiness assessment. What is your sense of when that's going to be complete?

MR. CRANE: The assessment is complete for the summer readiness. Our window for summer readiness starts May 15th. So we have our actions to take place that were required prior to the summer completed at this time.

There are some follow-up lessons learned from the issue at Dresden last week that we are putting into the mix. But essentially, they are done.

COMMISSION MERRIFIELD: On your slide -- let's see -- I forget the exact place but you talked about fast plant trip turn around.

Fast that's another pejorative word that sometimes causes a bit of uncomfortableness on this side of the table. I hope fast means prompt and safe.

Can you talk a little bit more about what you are doing with that particular program?

MR. CRANE: Yes. I don't want to allude to anything different. It is safe. But we feel that if the duty staff has gone through the outstanding potential material condition issues or the required surveillances that would have to be performed and they know who their duty partners are, that we can more expeditiously bring a unit back to service safely.

So you still follow all the rigor. But when you get the call at 2 o'clock in the morning that you have lost the unit and the cobwebs are there, you are not starting from scratch. You are a rehearsed ready team with a duty leader and specific disciplines have been assigned and they are on the rotation for a week. And the next week the new rotation starts. We would be prepared to do it.

Also, with that, comes our arrangements. If it was a grid issue on priority for us to have the start up sources required, prearranged, understood, table topped, and communicated on how we would start a plant that may not be next to the hydro plant but get the same priority of power coming in to restart the unit.

COMMISSIONER MERRIFIELD: I only bring out that issue in particular because obviously we engage a lot -- regulator to regulated -- on the need for thorough root cause analysis. And having the -- recognizing the desire to produce, yet not have that degrade from safety.

I thoroughly recognize there was a lot of desire to try to have the plants come back on line on the 14th because of the obvious need for the grid as a whole. But I want to make sure that we are doing it the right way. And I just wanted to leave that there.

MR. CRANE: Right. If you take Oyster Creek, which was one of the only ones of our 17 reactors that went down in the blackout, there were four teams that were rehearsed right away, that knew what they had to do. One is the transit analysis team. They go in and look at how the whole unit responded, all the systems, is there anything out of spec that needs to be addressed prior to the unit coming up.

The second is the root cause team. What happened, what do we have to do to fix it.

The third is the restart team. As the systems all settle and everything's validated to be okay, and the resources can proceed, our control room operators in the boiling water reactors will start exercising rods and doing the surveillances in prep for a restart. That doesn't take anything away the other resources.

And the final team is the oversight team that schedules and watches all of their activities.

So it's a pretty deliberate effort. But we will get to the root cause and we will understand what the transient did on the plant itself prior to coming back.

COMMISSIONER MERRIFIELD: Since I'm running out of time, I guess my last issue is for Mr. Dugger. Ms. Silverstein raised a variety of different suggestions about how we as an agency and imposing our licensees can do, perhaps, a better job. I think there are some very good things for us to think about.

You did note -- you had specific concerns about her recommendations, vis-a-vis cyber security. I would be interested at some point -- and again, I don't have time because we are short, to go into the issues that she had on her slides, six, seven, and eight. But I would be interested in some greater detail from NEI on what I think are some interesting proposals here.

Last comment I would say, recognizing the NEI and its members have conducted a lot of work relative to the protecting of the plants and understanding the grid, I do have to say we continue to have issues -- whether we like it or not, we continue to have switch yard issues. They seem to continue to bite the plants. And I think that's one we are just going to have to keep an eye on.

I don't mean this to focus on Mr. Crane. But there's an awful lot of plants out there that have had this problem. And certainly, we all need to keep our eyes on it.

Thank you, Mr. Chairman. I did the best I could.

CHAIRMAN DIAZ: You did very well. I'm going to agree with your last comment.

There are two ways that we can lose power to the power plants.

One is, somebody does something out there they shouldn't do. And the other one, the plant does it itself. And that's the last one that we don't want to see, that we want to reduce even further.

I think we have heard, you know, an excellent series of discussion of very serious issues. But more than that, I think that I saw proposals of solutions.

I'm not sure that, you know, we are in the position to agree or disagree with many of them. But I can tell you that they will be taken very seriously. I think there's a series of proposals that match many of the things that we have been considering or we have done and how this entire thing fits together as a package that increases the reliability of the supply of power to our power plants and, at the same time, how our power plants can contribute to the reliability of the grids, I think, are very important issues.

And I want to thank you, again, for your contributions.

I think I have a couple of questions. I'll start with Ms. Silverstein.

You know, I think it's the issue of what authority does FERC and the NERC actually have at the present time. I know I have been trying to read about it, but are you capable, on specific issues, to issue fines for somebody that does not maintain the proper procedures or reliability of the grid? Is that FERC?

I know the legislation is trying to address that. But I know there was an internal proposal that was trying to deal with that issue. I don't know where we are right now.

MS. SILVERSTEIN: At this time, without legislation, FERC cannot levy penalties for noncompliance. We have, however, defined compliance with NERC standards as part of good utility practice, which is included in our tariffs.

And our lawyers are exploring the possibility that if someone provide substandard or unreliable service, because of a failure to deliver reliable service and to observe good utility practices, that that represents inadequate delivery of service that would require a refund of the fees that were paid for the transmission service. That, however, may not be hugely costly as a deterrent.

CHAIRMAN DIAZ: So then you still agree that the legislation, as far as you are concerned from your viewpoint, that would be the best outcome?

MS. SILVERSTEIN: Yes, sir.

CHAIRMAN DIAZ: And I'm sure Mr. Nevius seems to agree with that.

On slide seven, you talk about issuing contracts between the nuclear power plants and the grid operating entity. I, of course, agree with the issue of clear accountability.

Is there a road map to do that? Is there a way that we can look at it, and utilities can look at it?

Of course they are going to do it. We are not going to enter into contracts. But is there a clear road map you have to achieve that potential outcome that might be something that is worthwhile?

MS. SILVERSTEIN: Yes, sir, I think there are. Mr. Nevius referred to the reliability readiness audits that have occurred. And Mr. Dugger suggested that SOERs addressing these things. With all due respect, it may be addressed on the nuclear side of

the house. But the message doesn't appear to be getting through consistently on the grid operator side of the house.

We would have to disagree with Mr. Nevius with respect to his optimism as to how many of the grid operators who have been audited, in fact, are getting this message and have clear views.

Out of the 16 reliability readiness audits that have been conducted to date, FERC staff have been on every one. And 13 of those 16 operate nuclear power plants. Of those 13 entities that are serving nuclear power plants, only two have -- perhaps three to five -- have good high quality information about the nuclear power plants and their voltage needs and appropriate operating conditions and warning signals and communications between the grid operator and the plant.

Two of them are very, very good. Florida Power and Light and Ameren, in particular, have done a very good job on this. You might look closely at them.

It needs more study before we can say these are models. But they are certainly doing something right.

But out of the thirteen, only five are clearly doing it very well. And the others are -- clueless is a strong word and probably not the right one -- but do not know as much as they need to about what the nuclear power plants' needs are, how to communicate with them. And it goes to the heart of the accountability issue.

CHAIRMAN DIAZ: Although we are short of time, I notice Mr. Nevius. I am going to give you -- instead of asking you a question, I am going to give you two minutes to discuss your results of the audits and, in a certain way, maybe reply to Ms. Silverstein.

MR. NEVIUS: There's always room for improvement. When the final audit reports are complete and posted, then I think we have a public basis to discuss where we can improve further. I don't disagree that there will be some utilities that will have better agreements in place.

And to the extend we can use those as models to help others improve on their agreements and procedure, we should absolutely do that.

CHAIRMAN DIAZ: I am sure we are all on the same side of the fence of this. We all want disagreements to be as good as they can be so we can rely on the reliability of the grid that is as good as it should be. I'm sure there's no argument on that point.

Let me just go to Mr. Crane.

And of course, you are responsible for 17 nuclear power plants? That's more than anybody.

How would you then characterize the relationship between your power plants and the transmission grid operators reliability? You believe that you have a full understanding of what they do and do they have a full understanding of what you do?

And do you have the right protocols to make sure that those understandings are, you know, effective if they need to be exercised?

MR. CRANE: I do believe we have that. But I think as we have benefited in our operating experience and benchmarking from plant to plant, that the information that NERC may be able to give us for better templates. We could be on some continuum of strong performance.

But we do have clear communications. We have affiliate agreements with the transmission operators who, at most facilities, are part of our corporation. We have

agreements that we are working on ensuring we enhance from companies to be able to have that in place.

One of our affiliate agreements for support is with Ameren. And we find that that works well.

Communications through the control room, through the nuclear duty officer. It's a structured set of communications. But we did find that our statewide estimator was not being communicated in self-assessment.

So I don't think it's a one time, we will be able to make the statement to you. It's going to have to be built in our constant self-assessments and evaluations and being able to share best practices. So we will make sure that we are growing as an industry.

CHAIRMAN DIAZ: You have been using a word that I have been using for some time, that dirty word called communication which sometimes comes back to bite us. I lately have been thinking that we need to take that one step further to communication management. This is not an open ended loop. It's how you manage the communications and what you do with the outcomes of that management that become important. It's important to us and I think it's important to you.

Let me ask Chuck. You know, you have this broader look of the industry. And there is, of course, this -- I don't know whether it is speculation, there are actual reports that deregulation of electricity in many ways, could result in a less reliable grid. And of course, if I look at nuclear power plants, about more than half of them now are in a deregulated environment -- and I think the number is about 60 percent -- I'm not sure what the number is. That is always a concern.

What are your thought on this? Is the issue of deregulation creating a bigger factor of concern regarding grid reliability?

MR. DUGGER: Well, that just hit right to the crux of this, huh?

CHAIRMAN DIAZ: I think so.

MR. DUGGER: Being affiliated with NEI, I'm also affiliated with Entergy, which operates quite a few deregulated nuclear power plants. Not as many as Mr. Crane but quite a few. And some of ours were located in the Northeast.

We have not found that grid reliability has been a tremendous issue for us. The August 14th event is one data point of course, that kind of stands out. But our -- the bigger issues are issues that you alluded to earlier. And that is, equipment performance or operator performance or individual plant performance.

If you look at the data -- and it's pretty well summarized in the back of the temporary instruction that you are using to look at the various nuclear power plants. And you look across what has caused trips of plants and loss of units or loss of offsite power, very few of it is related to grid disturbance or grid reliability issues.

So, it's hard for me to draw a conclusion that deregulation itself has created a problem for utilities. I think it's created a challenge for better communication.

It has created a challenge for a different level of procedural control and procedural communication between the power plants and the grid operators. And that the various states of the grid have to be well defined and communicated between the power plant operators and the grid operators.

CHAIRMAN DIAZ: How about the length of the outage time which seems to have increased? We have fewer but they are longer. Have you found any corelation between the length of the outage time and deregulated or regulated utilities?

MR. DUGGER: Chairman, I don't have any data on that. I'm afraid I can't answer that question.

CHAIRMAN DIAZ: Does anybody have any data on that?

COMMISSIONER MERRIFIELD: Mr. Chairman, I think, perhaps, when we have the next panel with our staff, that goes to the heart of one of the key findings of our April 29th operating experience assessment report on grid effects -- was that while the number, the periodicity of the grid disturbances had decreased, the duration had, in fact, increased. And during the key summer months, had increased plant risks that came with it.

CHAIRMAN DIAZ: Thank you very much.

Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: Thank you, Mr. Chairman. I'm going to start with Ms. Silverstein, too.

And I heard your presentation. I'm sympathetic to some of Commissioner Merrifield's remarks with regard to where our responsibility might begin and yours might begin.

And taking the hypothesis at the moment -- and I am granting it to you -- that there might be a need for additional requirements, given the current situation in the lack of legislation, the lack of mandatory standards, it strikes me that by the time an NRC rulemaking process were to grind its way towards a new requirement, that situation might

have changed. And so we face, you know, a tremendous amount of uncertainty when we try to figure out what, if any, requirements to put on there.

There seems to be near unanimity that you should have the authority to establish mandatory standards or NERC should be able to establish mandatory standards. As one of you said, it's been in legislation for many years. It's just unfortunate that it hasn't gotten through both Houses and to the President. And we have, as Commissioner Merrifield alluded to, a few provisions like that ourselves. So what would you suggest we do in thinking about requirements?

Because in all honesty, some of the things you're suggesting to us appear to me to be things you could do if you had more authority. And they clearly, in my mind, stretch our authority. That clearly was Mr. Dugger's point.

So if you are on our side of the table and you are trying to figure out, is it worth trying to impose an additional requirement for today that might or might not have a large effect and that wouldn't be needed, should you have the authority that you're seeking?

MS. SILVERSTEIN: I do not think that you run the risk that better communications between a nuclear power plant and a grid operator will not be needed in the future. I do not think that you run the risk that there will be less of a cyber security threat to nuclear power plants or to the grid in the future.

COMMISSIONER McGAFFIGAN: Let's take those two. Mr. Dugger -- I'll give him a chance to talk. But we took cyber security very seriously. We prepared for Y-2K. We have found, essentially, no risks of plant safety systems to cyber security.

The risk that you are raising is that if somebody does something to the grid and, therefore, creates a blackout, then there might be some playback -- I don't want to put words in your mouth -- but that that could challenge us -- but we have already with Station Blackout Rules and other provisions prepared for such things.

So what is it -- why would we go ahead and impose a NERC requirement on cyber security, presumably, for nonsafety-related systems ahead of everybody else? You know, without any evidence of the nuclear power plants are the ones contributing to the problem.

That's the end of the question.

MS. SILVERSTEIN: Two things. On cyber security, we know that grid operators, generally, and nuclear power plants are common targets of cyber attackers. And we know that either the grid and its computer systems can be a vector into a nuclear power plant for a cyber problem and vice versa.

So the entire set of cyber issues is a careful balance of how much do you want to protect yourself against somebody who knows how to attack cyber systems better than you know how to protect.

COMMISSIONER McGAFFIGAN: We know how to protect the plant. We have protected the plant. We can safely shut down the plant.

I don't find that the fact that nuclear and grids are both on somebody's list doesn't make it more necessary for us as a safety regulator to take an additional action when we have taken a lot of actions, which the staff could document better than me, to ensure that our plants don't have a lot of cyber vulnerabilities or any on the safety systems.

MS. SILVERSTEIN: If you all are confident that your plants do not have significant cyber vulnerability, then certainly you don't need the NERC Standard 1200.

But I can tell you that most of the grid operator cyber experts will tell me off the record, but not on, that their companies cannot meet all of the requirements of Standard 1200, even though those are minimum daily adult requirements and not highly technical.

So if your nuclear plant operators are better than that, then certainly my hat is off to them.

On the topic of what do we have the authority to compel, you will note that in slide seven I recommend the use of contracts and the use of a FERC tariff to address these issues because contracts are voluntary. And a FERC tariff -- I don't know how long it takes you all to do rule makings and I don't know what the scope of your authority is. But I do know how long it takes us to do tariffs and I do know how long a contract takes.

And I suspect that, even if you do not have the authority to compel nor the desire to go through a protracted rulemaking to require such communications and explicit allocation and articulation of authority, if you do not want to take that on as a formal regulatory matter, you, nonetheless, have a significant bully-pulpit that you can use to encourage your members to undertake this kind of thing.

And what it will do is it will improve the protections one plant at a time, one area at a time, for every nuclear power plant operator that chooses to communicate and protect its own needs more effectively by communicating with its grid operator.

COMMISSIONER McGAFFIGAN: Again, I want to let somebody else -- I'm running into the same problem as Commissioner Merrifield. But the contracts between the

nuclear power plant and the transmission operator and the regional reliability coordinator for clear accountability, that sounds like it's something that, at the very margins of our regulatory responsibility, and we could -- and perhaps the staff already has in its regulatory issues summary they have done -- and clearly, NEI and IMPO have encouraged people to do something like this.

But if we were to try to require it as an additional requirement in our Part 50, so that it's something other than a bully-pulpit -- you have used the bully-pulpit today to suggest from FERC's authority that you would like to see this. Speaking just as one Commissioner, I have my doubts as to whether this is something we could do in a reasonable period of time or how it's in our regulatory authority.

At some point, and I agree with Commissioner Merrifield again, that we need to work out MOUs with various people so we understand who is responsible for what and we don't get into each other's business and what we do is mutually reinforcing. But I don't know that doing this through some bully-pulpit approach is going to be all that effective.

COMMISSIONER MERRIFIELD: I think Commissioner McGaffigan makes a very fair point. Going to the issue, for example, of the computer security however, it would seem to me that we have got a gap. And the gap is that either there are being raised, some issues that we don't have a full awareness of, which may well be the case, or equally the case, it may be that we have not done as good a job of explaining what we have done in order to ensure that there's sufficient cyber security at the plants that we regulate.

So again, I think a positive coming out of all of this is the enhancement and some further dialogue that we can have on a staff-to-staff basis between the NRC staff and

the FERC staff, to perhaps, on breaking down some of those issues and having a better understanding of how each of us works and the information we have.

COMMISSIONER McGAFFIGAN: I agree with Commissioner Merrifield. I think the problem in cyber security is our focus is on can the plant safely be shut down. We are highly confident of that.

FERC's focus is on having a grid continue to work despite cyber attacks. And that is a laudable goal as well but it's one that we may be able to contribute at the margin. But it isn't necessarily our goal under our statutory authority.

Mr. Dugger, we will let you get a word in edge wise here. The issue of this cyber security, let's take that. You said you didn't think you needed this mandatory NERC thing to apply. Go into a little more detail.

Are you already there? Are there gaps. Or is the NERC standard focused on other than reliably shutting down the plant? What's going on?

MR. DUGGER: Well, preemptive to anything else, we did put together a cyber security task force. That was in more of a response to security issues in general than it was to just specific to cyber security.

But we have found, having gone through the exercise of cyber security at the plants, that we did need to make enhancements and harden those during the post 9-11 security issues.

Now we are talking about relay houses, and switch gear and transmission distribution.

And I would say that on August 14th, we had something in the neighborhood of 500 plants that tripped off the line. We had eight or nine nuclear units that came off the

line or were off the line effected by the blackout. And certainly, you have the authority, if you wanted to, I guess, to impose regulation on us that would perhaps protect us out one more step from where we are at right now, perhaps into the next breaker or the next breaker.

But the remaining portion of the grid is still out there. And all the rest of those gas units and combined cycle and coal, oil-fired units are still out there. Simply for us to have that additional protection wouldn't necessarily help us in the greater scheme of things.

COMMISSIONER McGAFFIGAN: So the cyber security is just one step out? It isn't focused on plant internal systems? The cyber security that is talked about in this NERC thing is out there in the switch yards and the computer systems that operate that?

MR. DUGGER: Yes.

COMMISSIONER McGAFFIGAN: Is that correct?

MR. NEVIUS: It's a bit more general than that. And I would be glad to leave you a copy of the Standard 1200. It talks about overall cyber security policies.

CHAIRMAN DIAZ: You can give a copy to the Secretary. She can distribute it to the Commission.

COMMISSIONER McGAFFIGAN: My time is just about up. Let me go back to Mr. Nevius.

At one point -- and I tried to take down the words you said -- you talked about this MOU and how it was desirable and you're focusing on MOUs with other parties as well. You said something to the effect that it would have been nice to have staff engineers on site. Are you referring to NRC staff engineers?

MR. NEVIUS: NRC staff engineers in Princeton where we had the other --

COMMISSIONER McGAFFIGAN: At your site.

MR. NEVIUS: We had 100 investigators during the blackout investigation.

COMMISSIONER McGAFFIGAN: And that was precluded by what?

MR. NEVIUS: I'm not sure.

COMMISSIONER McGAFFIGAN: That's what you're referring to. I thought you wanted NRC and staff engineers on our nuclear sites to interact with your folks. So staff engineers at Princeton, New Jersey, as you are working on this thing?

MR. NEVIUS: Right.

COMMISSIONER McGAFFIGAN: And an MOU would have facilitated that in your review?

MR. NEVIUS: Right.

CHAIRMAN DIAZ: Did you ever make such a request?

MR. NEVIUS: Yes.

CHAIRMAN DIAZ: To whom?

MR. NEVIUS: I forget. Several staff folks here.

COMMISSIONER McGAFFIGAN: Let me also -- Mr. Crane, I do feel a little bit like we put you in a Sports Illustrated situation here today. But you haven't given it a full chance to -- I thought you did a very good job of explaining why you didn't like to have this event.

But what I heard you also say is you only had one unit operating. You did choose to do the switch yard work at a time when only one unit was operating, the other was in an outage. That, presumably, was a risk calculation that you made. I think

Mr. Nevius talked about or somebody talked about doing things so that you are causing least risk either to yourself or to the grid. That was probably part of a plan.

You had everybody briefed up. Everybody knew this was a high risk maintenance activity. It might lead to the trip of the other unit. And you had contingency plans for it. Right?

MR. CRANE: That is true. That is a debate with the staff. But that is our feeling.

It was not a debate. It was an early question after the event.

We had -- this was a phase testing. There was a portion of this testing that would affect Unit 2 that had been shut down. And there was a portion of this testing that affected Unit 3.

We had taken previous opportunity to do the testing on Unit 2 while it was taken off line a few weeks back, prior to its previous shutdown for motor failure. We had put all the contingencies in place, made sure that we had hardened Unit 3 in that period while Unit 3 was operating.

At this period, we had no other windows to take Unit 3 off line. But we wanted to make sure that the testing was completed before the summer readiness. We start, like I said, on May 15th, really watching very closely all activities. Not to say that we don't through the rest of the year but it's the height and the awareness period.

So we felt that we had placed the Unit at the best time and in the best condition to perform the testing. The testing was actually supposed to take place the shift prior to that. One very important safety system, the isolation condenser was out of service,

had not returned from service. And the shift manager had looked at the grid condition, looked at it as potential for transient and delayed the outage.

So we think we are training our people to be very conscious of the external situation and the risk situation.

When we went into the activity, all the control room operators were briefed. This was -- we call them a production risk -- production is the same thing as losing a unit and what are all the different briefings that need to be given prior to that event.

My pager went off prior to the switching taking place. So it was even up to me that we were beginning to engage in a high risk opportunity.

When the activity happened, a component failed, not anticipated to fail. But all people were in place in case of its failure. And we were able to safely contain the situation and restore offsite power.

COMMISSIONER McGAFFIGAN: I'm going to finish on one note that I think the two ends of the table I heard agree on. And that is that we may need to look at some of these plant tech specs and decide whether they are very conservative from a safety perspective and they deserve to be conservative from a safety perspective. We won't likely change them.

You said that you will continue to work under them, of course. But they may be as Ms. Silverstein said -- and I think you agreed Mr. Crane -- that they may be too protective. And without taking into account the consequences of our plants tripping off more rapidly than they might need to from a safety perspective. And you are not pushing anything over than a safety perspective is, I am sure, what you are about to say.

MS. SILVERSTEIN: No, sir. It is not our place to tell you what your plants' tech specs or safety requirements are. My goal is to encourage you to make sure that the folks who operate the grid that serves your plants know what you plants' needs are. Not just that your folks think that they have -- they know what their needs are, but that they have told them and everybody clears understands everything that is needed to take care of that nuclear plant effectively and what its needs are.

We don't want to tell you how to operate a nuclear plant safely. That's your job.

MR. CRANE: And our concern with that is we believe that we operate -- we have good communications across the grid and we have good communications with the grid operators to the point that we hit a target in our tech specs that would say, take the plant off line or take certain actions.

Most of our facilities are closely co-located. We may cause a further situation by doing that. We think it should be evaluated and make sure that any compensatory actions or any actions that could be taken to mitigate something that could potentially worsen the issue is discussed.

COMMISSIONER McGAFFIGAN: And the decision you are talking about is not something that lends itself to a discussion that going to take an extended period of time. They would have to be made quickly right?

MR. CRANE: When we go into emergency maneuvers, it's less than 30 minutes that we have to do something.

CHAIRMAN DIAZ: Thank you, Commissioner McGaffigan. I want to thank each and every one of our panelists for their participation. I thought it was a very, very

good discussion. And I'm sure that we'll be continuing discussions on the issues and the resolution, hopefully, of many of them. Thank you again.

There's a small break right now.

(Brief recess.)

CHAIRMAN DIAZ: Good afternoon again.

Welcome to the second chapter. This time we have our staff here. I just want to say at the onset that leading the staff is Sam Collins, who is the deputy EDO for reactor programs. Besides that, Sam was delegated by me the authority to deal with the issues of the blackout, to interact with federal agencies.

And so in many ways, Sam was the senior staff member who actually directed and controlled and coordinated and responded to most of the issues of the task force. He, of course, was responding directly to me.

And we interacted in this vein. But I want to recognize the tremendous amount of work that Sam did and all of the staff in completing this project.

And with that, Sam.

MR. COLLINS: Good afternoon, Chairman and Commissioners.

It's a pleasure to be here on behalf of the staff to brief the Commission on the background and status of the offsite power and grid issues related specifically to the blackout of August 14th, including lessons learned on the industry basis, taking advantage of operating experience before and after that period.

As you acknowledged, Chairman, the nuclear working group is one of two joint complementary paths the NRC is taking in response to the August 14th event. I appreciate your remarks at the opening of the meeting. I would like to acknowledge the

ceremony that was held recently which you hosted for those individuals for the task force working group who actually performed and accepted the additional task to create the nuclear generation portion of the working group report on behalf of the United States and our Canadian counterparts.

I'm going to abbreviate my remarks in recognition of the continuum in the meeting. I would like to get right to the discussions as well as provide for the question and answer period at the end of appropriate length. I would like to introduce briefly the staff who is with us today who represents the spectrum of the areas and issues that the staff is dealing with in response to this event.

On my left is Rich Barrett. Rich Barrett is the Director of the Division of Engineering for the office of Nuclear Reactor Regulation, NRR.

To Rich's left is Michael Cheok. Mike is the Assistant Branch Chief of the Operating Experience Risk Analysis Branch in the Office of Research, which is doing some very important work for us in the analysis area.

On my right is Corny Holden. Corny is representing the project organization of the Office of Nuclear Reactor Regulation.

To Corny's right is Ronaldo Jenkins, who's the Chief of the Engineering Section of the office of NRR.

And as you know, Jose Calvo has asked to address the Commission today. Jose is the Chief of the Electrical and Instrument and Controls Branch of the Office of Nuclear Reactor Regulation.

We understand the Commission's desire to focus on completion of the analysis of the potential grid issues, including an action plan to address them in an

expedient way. And the staff welcomes any direction from the Commission as a result of this meeting.

With that, I would like to now turn the presentation over to Rich Barrett for an overview of the staff presentation. Thank you.

MR. BARRETT: Thank you, Sam.

Mr. Chairman, Commissioners, the NRC staff has conducted an assessment of the risk significance of the August 14, 2003, grid outage, as well as other recent operational experience related to the loss of offsite power. The results of that assessment are preliminary. But they clearly point to two conclusions which have guided the staff actions that you will be hearing about today.

First, large scale grid events are important to nuclear power plant safety.

And second, a significant increase in risk may occur if equipment required to prevent or mitigate station blackout is unavailable due to maintenance when the grid is degraded.

In preparing for the summer of 2004, the staff has been working, not only with our licensees, but also with the organizations responsible for assuring grid reliability to address these two conclusions.

Cornelius Holden will briefly describe NRC participation in the U.S.-Canada Power System Outage Task Force. And Ronaldo Jenkins will discuss the staff actions in preparation for the summer of 2004.

Corny.

MR. COLLINS: Chairman, there was a question raised before Corny starts his presentation, having to do with the staff support and response to the request for resources for the electrical working group.

That decision was mine. I take accountability for the decision. We tried to accommodate, to the best of our ability, a request for additional resources for the additional groups, the cyber security, the electrical and, of course, the nuclear generation, as well as the Canadian side of those particular activities.

There was a request for an individual, a specific individual who was a member of our Research staff, who is also an integral part of the nuclear generation working group effort. We tried to accommodate that, perhaps, not successfully. And we welcome that constructive feedback on a continuous dedicated basis.

We moved to an on-demand basis, including participation in meetings in response to questions in order to support the electrical working group. We thought that was sufficient, I think, to the extent that in nuclear generation input from the NRC was provided for. And certainly, we can talk after the meeting if there's any other view of that. But I do take accountability for that decision on an efficiency and effectiveness basis.

CHAIRMAN DIAZ: Thank you. Corny?

MR. HOLDEN: Good afternoon. Today we are here to continue the discussion.

I think, Chairman, you brought up a number of good issues with your introductory remarks. I will abbreviate some of my comments.

May I have the next slide, please.

COMMISSIONER MERRIFIELD: Do you know which slide you are on?

MR. HOLDEN: Right now we are on topics. I think Rich Barrett briefly covered those. I'm going to touch on the joint task force report. And then Ronaldo Jenkins will discuss the regulatory requirements and short-term and long-term actions.

Next slide.

We have all been talking about the joint task force report. I won't go into that. But I think that most important for the nuclear power plants, in terms of the root causes of that, was inadequate system understanding. This root cause was exhibited by low reactor power reserve, failure to readjust the system within a 30-minute time limit to prepare for the next contingency, and inadequate oversight of the voltage criteria, among others.

The report stated if nothing else changed, we could expect the frequency of large scale events to increase compared to historic experience. The reason we are here today is because this is a significant issue. Evidence of this is in several places.

First, the industry trends program for operating reactors identified two early warning prediction limits that were crossed in 2003, automatic scrams and safety system actuations.

The increase in automatic scrams in 2003 was due to increase in grid and switchyard-related problems. Twenty three scrams were attributed to seven grid-related events, seven switchyard problems and the nine plants that tripped on August 14th. This is compared to 26 scrams for the preceding six-year period. Safety system actuation followed scrams. This was the case in 2003.

Second, the preliminary accident sequence precursor results for August 14th events show that for the eight plants that lost offsite power during the August 14th event,

five had an accident sequence precursor value at ten to the minus fourth or higher. Accident sequence precursor program defines an important indicator with a value of greater than or equal to ten to the minus fourth.

Thirteen important precursors have been identified since 1994. Three of these were the result of the loss of offsite power. These preliminary results have been sent to the effective licensees for comment.

Final results will be published upon the Office of Research review of the individual licensee comments.

Finally, the joint task force electric working group modeled conditions on August 14th in the Ohio area and determined that tripping of the Perry Plant, after 3:05 p.m., on August 14th could have put the region into a voltage collapse. This modeling used plant and transmission line configurations throughout the day of August 14th.

August 14th was not a peak day for Ohio. There were other days that loads had been higher. These contingencies should have been assessed by the grid operator but were not.

So we have two indicators that tell us that we have an early warning or important precursors. And we have modeling of the grid that shows conditions could have been worse.

I think we heard from members of the electric working group about the recommendations. So we don't need to go into those. So I'll turn it over to Ronaldo Jenkins.

MR. JENKINS: Good afternoon. I will give a brief overview of the applicable regulations for the offsite power system, which is the preferred power source for safety systems and components at a nuclear power plant.

I will then discuss on-going and planned actions to address grid-related issues.

Going to the first bullet, General Design Criterion 17 details the electric power requirements for nuclear power plants. The onsite and offsite power supplies together assure reliable power for safety-related functions.

Each power type, independent of each other, have different characteristics. Each power source must be capable of safely shutting down the reactor.

In addition, GDC 17 requires that provisions must be included to minimize the loss of offsite power.

Going to the next bullet, 10 CFR 50.63. The station blackout rule was written to address the condition where a loss of all AC power occurs. In addition to the loss of offsite power event or loop, the plant loses the onsite power supplies, typically, emergency diesel generators.

Loops are considered to be a precursor to a station blackout. Therefore, an increase in the frequency or duration of loops increases the risk of core damage.

The next bullet on the slide refers to 10 CFR 50.65, the maintenance rule, where section A 4 of that rule requires that licensees assess and manage the increase in risks that may result from proposed maintenance activities.

The staff endorses section 11 of the industry guidance document, NUMARC 9301, that provides methods that are acceptable for meeting Section A.4. NUMARC 9301 addresses grid reliability and offsite power availability in several areas.

In addition, as conditions such as offsite power availability change, a maintenance activity in progress should be reassessed for unacceptable changes in risk.

Lastly, the last bullet refers to plant technical specifications that requires that offsite power be demonstrated operable, consistent with the design requirements.

If offsite power sources are not capable of supporting plant safety requirements, the system must be declared inoperable. Provisions are then provided that requires for timely corrective actions which, if not completed, can lead to a plant's shut down.

Next slide.

In order to put the current staff actions into perspective, it's useful to revisit earlier staff actions to address grid reliability concerns.

Although the 1996 Western Grid Disturbance event had garnered a lot of national attention, none of the nuclear plants involved experienced a loss of offsite power. However, due to the possibility that deregulation may effect grid reliability, the Commission asked the staff to examine what actions, if any, should be taken.

To address this concern, the staff visited a number of reliability control centers, including the newly formed independent system operators, made contact with the Federal Energy Regulatory Commission and NERC staffs. We also issued Information Notice 9807 to raise licensee awareness on this issue.

Based on the review of the plant operating experience data and the limited risk studies, the staff recommended that no additional regulatory action be taken.

Next slide.

As note on the slide, the Calloway Degraded Voltage event occurred in 1999. This event was significant because the cause was attributed to high grid power flows around the plant. According to the report filed by the licensee, these power flows were caused in part by the grid operating under a deregulated wholesale market. Because Calloway was supporting the grid voltage in the vicinity of the plant, the low grid voltage had not been observed until the plant tripped and voltage support was no longer available.

If a design basis event had occurred during the time of high system demand and the unit had tripped, the plant's degraded voltage relays would have separated the safety buses from the offsite power system.

One common characteristic of the Calloway event and similar events is that the true capability of the offsite power source cannot necessarily be verified through direct readings of plant switch yard or safety bus voltages. Instead, analysis of grid and plant conditions must be relied upon in order to determine this capability.

If these analysis are not accurate and up-to-date, licensees could inadvertently operate their plants under inadequate voltage conditions.

As shown in the second bullet, the staff communicated to the industry through Regulatory Information Summary 2000-24, our concerns regarding voltage inadequacy. Now we come to recent staff actions in response to the August 14th, 2003 blackout, which I will refer to as power outage, in order to differentiate that from the station blackout.

Next slide.

Short term actions refer to those steps we will take prior to and during the summer. The first step involved gathering the concerns from various sources.

These sources included the internal NRR working group, input from the regions, the joint task force interim report, NERC, and other staff reports.

Then at that time, a deterministic review was conducted on the approximately 50 grid-related issues. The team prioritized the issues according to their relevance to the four NRC performance goals with the most weight being placed on maintaining safety.

Next, a series of probabilistic sensitivity studies were performed to obtain risk insights on these issues. And some of the findings from this review were that the long duration of loops are safety significant, that equipment that becomes unavailable due to planned maintenance can reduce the plant's ability to cope with a power outage event. And then, as an office of Research study has shown, there is a tendency for the grid to be less reliable during the summer.

Using these risk insights and the deterministic review results, we developed a three-prong approach to address grid-related issues this summer.

Next slide, slide eight.

Consistent with our objective to ensure that nuclear power plants are ready for a similar power outage event this summer, we selected three strategies. First, to raise awareness of these issues with licensees, Regulatory Information Summary 2004-05, was issued on April 15th.

This generic communication complemented the series of meetings the staff has had with stakeholder organizations such as the Nuclear Energy Institute. The staff has met several times with FERC and NERC staffs to stay informed of their activities. The staff

conducted information gathering visits to the Midwest independent system operator or ISO and the New York ISO to better understand their interface with nuclear power plants.

As shown on the next sub bullet, the staff issued a temporary instruction or TI to verify the operational readiness of nuclear power plants. This TI was issued on April 29th. And we plan to complete our review by June 30th.

Lastly, the staff plans to maintain cognizance of grid conditions during the summer.

Next slide.

The staff plans to use the TI and operating experience data obtained this summer to shape any future staff actions. One long term action is in the Office of Research Study on the risk implications of the August 14th, 2003, power outage on the Station Blackout Rule.

Overall, we plan to complete our analysis of grid-related issues by June of 2005.

As indicated by the last bullet, long-term actions will focus on the adequacy of existing regulatory requirements.

Thank you.

MR. COLLINS: Commissioners, that is the staff presentation at this point. We would now like to --

CHAIRMAN DIAZ: Let me just introduce the presentation of Mr. Calvo.

Thank you, Mr. Collins.

I know that Mr. Calvo is deeply interested in addressing the Commission. We have seen your documentation. We have seen your slides. We are pleased that you are here with us today.

I will ask you that, you have a large number of slides, so please get to the point of every one of them so that we can go ahead and have time for questions.

MR. CALVO: Thank you so very much. I believe I can make it fifteen minutes.

CHAIRMAN DIAZ: That sounds excellent.

MR. CALVO: I will try to slow down a little bit.

Good afternoon, Mr. Chairman and Commissioners. I would like to thank you for providing me with the opportunity to give you an update of the resolution status of the grid issues highlighted in the Nuclear Power Plant grid report entitled, "The State of U.S. Power Grid from a Nuclear Power Plant Perspective," issued in December 2003.

Number 2 slide.

Before I start with my presentation, I would like to take this opportunity to thank the electrical staff for their outstanding performance in moving forward the resolution of the grid issues.

I would like to start with recommendations to be followed by other topics which will address the reasons for the recommendations.

The first recommendation is slide number three.

The power blackout event on August 14, 2003, highlighted the fact that the Nation's electrical grid is no longer being operated in the manner envisioned when the grid was designed and constructed. The evolving deregulation of the electric industry raises

the potential issue of how the reliability of the grid impacts the safe operation of nuclear power plants. An unreliable grid cannot ensure the availability of offsite power, which is essential to ensure the safe operation of nuclear power plants.

Given that independent grid organizations are now responsible for ensuring the overall reliability of the grid in many regional areas, it is vitally important that these organizations are aware of nuclear power plant requirements.

The interactions between the NRC electrical staff and other government agencies and industry must significantly increase.

The NRC needs to work closely with other grid-related entities such as FERC and NERC to ensure that the grid is managed in a manner that would ensure reliable offsite power for safe nuclear power plant operations.

Slide number four.

Second recommendation. What is the likelihood that another power blackout event will occur in the future, and what impact could it have on the safe operation on nuclear power plants? The honest answer is that neither the NRC nor the industry has collected sufficient data over the years to make a credible prediction today.

Grid reliability decisions are now made at the regional level instead of the local level as in the past. Thus there is an important need to collect grid operational data at both the local and regional levels to be used for predicting the likelihood of another blackout event and its potential impact on the safe operation of nuclear power plants.

It is better to focus in preventing a problem from occurring than to spend extraordinary amount of time trying to find out what happen and why.

It is recommended that the NRC staff prepare a memorandum of understanding between the NRC and FERC and NERC to share grid data.

Next slide, slide number five.

There's three more recommendations on this slide, what to do with the licensing bases. As you are aware from the previous presentation, NRC has issued a Regulatory Issue Summary to raise awareness among the licensees. Given the limited amount of time before summer of 2004 is upon us, the electrical staff, who includes me, endorsed such an action. As you may be aware, a Regulatory Information Summary, does not require any action or written response.

Irrespective of the outcome of the verification of the nuclear power plants for readiness, the agency needs to verify that the licensing bases documented in the updated FSAR are current and reflect how the grid is managed in the 21st century and its impact on nuclear power plants, including the adequacy of technical specifications.

It is important for the public to perceive that the agency continues to be aligned with NRC Performance Goal 3, "Ensure Openness in Our Regulatory Process."

The second recommendation in this slide, the NRR grid report, as it will indicate later, additional effort will be required to complete addressing all the issues in that report.

The final recommendation is an ombudsperson. The Commission should consider the establishment of an ombudsperson on technical matters to facilitate the resolution of complex issues not capable of being resolved by existing internal processes.

Next slide, number six.

The electrical branch related activities following the 2003 power blackout event. We have the Preliminary Accident Sequence Precursor. We have talked about this before. This was done by the Office of Research which indicated that these plants affected by the blackout had a high risk potential.

Following that up, the Nuclear Power Plant Grid report was issued in December 2003.

The electrical branch was assigned to resolve the issues identified in that report in January 2004.

We prepared an action plan and we issued it in February 2004, and so forth.

The next slide, number 7.

The next two or three slides will give you a status summary of the issues that were identified in that report. It's about 16 issues.

Ten of the issues have to do with grid reliability. Two issues had to do with risk assessment. One issue relates to the station blackout. And three issues relate to studies and collection of grid operational data.

The total number of all the grid issues collected for all the areas is about 48. And they are prioritized as follows: 13 are considered issues that should be resolved in the report in the short term. They will be addressed by the temporary instruction.

Those are not in the slides. I just got those yesterday.

Seventeen are related to the U.S.-Canadian Power System Outage Task Force, they are being addressed by FERC and NERC.

Thirteen are considered long-term; four are considered mid-term; and one is done out of the 16. It relates to the conditional core damage probability of nuclear power plants affected by the power blackout.

Now, going back again to the report of December 2003, three out of the four issues on grid reliability have to do with compliance. Those will be addressed by the temporary instruction. The remaining issue of the four had to do with the licensing basis and the verification of those in the FSAR.

The other two issues in that slide are engaging the NRC with external stakeholders. We started a little late with that but we engaged with representatives with the nuclear industry, including the nuclear power plant owners. This will be addressed by means of the temporary instruction.

Engaging with representative of other federal agencies, FERC, NERC, and the electrical industry, including control areas were limited in this scope. And we are doing that now recently.

Next slide, slide number 8.

There are two more issues remaining in there. One is the depletion of MVARs. The electrical staff is currently pursuing the licensees to address the measures taken to compensate for the depletion of MVARs as a result to implementing power uprates. We get more power by some kind of way. We are not taking care of the MVARs.

We are also working with the electrical industry with the number 2. We wanted to participate with them on matters related to cascading containment, which is important from the nuclear power plant standpoint. The electrical staff was not able to participate in those areas.

And also participate with the electrical industry on matters related to cyber attacks.

NSIR is evaluating cyber-security in nuclear power plants with NRR and Research assistance. So we have a program in place doing this.

Now we get into the issues of risk assessment. The Conditional Core Damage Probability that has been taken care of via the Accident Sequence Precursor Analysis.

Collective risk. The fact that so many nuclear power plants tripped. However, the current regulatory practice is oriented towards examination of individual nuclear power plant risks. I think a study should be considered to develop a methodology to assess the combined risk from loss of offsite power events that may simultaneously occur at multiple units and multiple sites due to a single large-scale grid.

Slide number ten.

This is three more issues that came out of that report. The determination of the adequacy of the Station Blackout assumptions that will be addressed as part of the TI.

And three issues remaining. These have to do with the underfrequency and undervoltage set points. And I think we should be looking into those because if we can produce those without tripping the nuclear power plants, I think we can help the grid in such a manner. But that has to be done in a way that it doesn't compromise safety.

Request control areas to collect grid operational data. We have discussed that before.

And the other issue that we have is to perform a feasibility study to determine potential improvements to the onsite power system, in the event that the grid reliability

cannot be assured. We are looking ahead into the future. If the grid doesn't get better, maybe we should be thinking about what we can do on site.

The next slide, number eleven.

All the requirements the GDC 17 has, the most important one -- at least the one we brought into focus on August 14 is that the loss of the largest generating capacity being supplied to the grid, loss of the most critical transmission line, or loss of the nuclear power plant itself will not cause grid instability and thus ensure grid reliability.

The underlying assumptions and licensing basis. Each nuclear power plant license should identify the underlying assumptions applicable to its facility as the basis for conducting the engineering analysis to demonstrate that the grid would meet at least the first contingency, meaning that it will remain stable. This will ensure the availability of site power to the nuclear power plant.

Before deregulation, the vertically integrated utilities they controlled generation, controlled transmission line, controlled customers. Whenever the reliability was threatened, the utilities could curtail transactions on their own initiative.

After deregulation, the management has gotten more complex. It is in the hands of the independent entities. They are responsible for dispatching transmission and generation and maintaining reliability in both normal and abnormal operating conditions.

In this new grid environment, nuclear power plants, in concert with the independent grid operators, must establish the operational requirements that must be maintained in order to ensure the availability of offsite power to the nuclear power plants in the event of a loss of load in the grid.

Number 12 slide, please.

The question is, what do nuclear power plants need from the electrical grid?

They need a reliable grid. A key question that the resident inspectors will be asking will be, first, three key questions. Tell me about the licensee contractual agreements between the nuclear power plant owner and the transmission operator that includes the required post-trip voltage range at the switch yard given the loss of the nuclear power plant, a critical transmission line or the loss of the largest generating capacity.

Also, notification to the nuclear power plant by the transmission operator that the grid has degraded to the point that meeting the first contingency is not possible.

The other one is the determination of how often does the one level entity -- does the independent system operator calculate post-trip voltage as related to the nuclear power plant. I think they can calculate those in less than one hour. Typically they do it in about eight minutes.

Collection of the grid operational data. This topic has been addressed before.

Now, the question is -- next slide, number 13 -- what does the grid need from the nuclear power plant?

The grid needs the nuclear power plant, just like any other power generation, to contribute to the reliability of the grid. So I think what the staff should be doing, evaluating -- or what we should do consider the evaluation of our regulations and technical specifications requirements to find out whether they are too restrictive.

This should include reassessment of degraded voltage sensing, reassessment of the nuclear power plant underfrequency trips, compensation for MVAR depletion.

So we should be looking at those things to determine -- because the more reliable the grid is, the better the nuclear power plant has in support in the development of the off-site power.

Now, also, support by the nuclear power plant in the restoration of the grid. Review the existing requirements to determine what improvements can be made without compromising safety.

Goals and objectives. I think that when we look at the branch today, what we should do together, the NRC, to boost the NRC capability to assess the grid reliability into the 21st century. We are still in the 20th and moving to the 21st. I think it's important.

And we do need to involve the electrical staff in grid-related matters which are attending conferences and participating in FERC/NERC standard process as it relates to matters that could impact safe operation of nuclear power plants.

Knowledge transfer. There's a lot of young people coming in. We are going to continue the training of our next generation of electrical staff by senior staff members. We have been doing this in my branch for the last eight months.

Update the regulations. We need to update the regulations for electrical power systems for nuclear power plants. We should look at them to find out whether they are addressing realistic operations of the grid in the 21st century. And it may or may not need a rulemaking. But I think we should look into that.

The other goal is the significant increase of interactions between the electrical branch and the external grid-related organizations. We can't continue operating in silence. We have got to work with the rest of the world and find out what we can do to help the nation's electrical supply.

And the last one, foster a work environment that values differing opinions and rewards safety-conscious thinking. This is NRC Performance Goal 3 Strategy.

We should encourage the staff to raise safety issues and guide the staff on how to proceed with the resolution of the issue using existing processes.

And persuading the Commission to establish an agency ombudsperson on technical matters. This has been discussed before.

That finishes my presentation. I would like to thank you very much for permitting me to brief you.

CHAIRMAN DIAZ: Thank you very much, Mr. Calvo. We appreciate your contributions.

And I think now we will pass the mike to Commissioner Merrifield.

COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman. Again, a lot more important issues we need to consider.

I think, first going to the staff, it has been almost nine months now since we had the blackout. And we are in the process now, I think you elude to this on slide eight, that we are verifying the readiness of our licensees in the summer of 2004 via a temporary instruction that they will be completing later in June.

I guess I'm trying to understand -- I know things take time -- and I know the Commission has a tendency of having unrealistic expectations of how quickly our staff can do things. Perhaps because we have such a high regard for our staff.

But I'm wondering why it took us quite so long to get to this point in the process and how we are going to be going about addressing any issues that we identify on our inspection?

MR. COLLINS: Let me give a broad overview and then I will ask Corny to start off.

The staff was always working at two levels. One of the task force, which I think the nuclear generation group adhered to an overall schedule as far as the issuance of the report. But our section of the report was precluded fairly early in the process.

We took those lessons and moved them into the on-going staff effort, which Jose has talked a little bit about that, as far as what we need to do on a continuing basis for specific NRC regulatory action. And a lot of this discussion in panel one and panel two has been over roles and responsibilities of where are those bounds?

The our goal for the staff is twofold. One is a short-term approach and readiness for the summer months, which our goal has always been to want to make the information available to the operators in conjunction with the various forms we had. Regulatory Information Conference, for example, was one foram. We have been working with NEI on a generic basis. We have been following up on specific events such as the Indian Point event, where there was a loss of power. Region I had the specific follow-up to that event.

The risk is the short-term notification. The TI is the longer term of what we need for data, as Jose spoke to, in order to understand better what are the boundaries of the conditions, how do they reflect back into the regulatory environment and where are we in the framework of rules and requirements, regulations and interfaces with our other stakeholders.

Corny, do you want to add to that?

MR. HOLDEN: I understand your question, Commissioner. I think the staff did work hard to try move forward on what we needed to do for this summer. Certainly, there were issues along the way that we had to address.

And I think one of those is just our understanding of the risk involved, in part because we don't have a very good tool to analyze the risk of the grid. So we had to look at ways in which we could do some sensitivity studies and try to further our knowledge there and advise us on going forward.

So I think, like Sam explained, we have the approach that we have. And certainly, we are all interested in getting it done as soon as we can.

COMMISSIONER MERRIFIELD: I appreciate that. I guess the only thing I would say is that it's getting pretty late. If we need to make any changes midstream, given what we know or find out, it's pretty late to do that. But I think it would have been -- maybe we need to look back and evaluate the process we used for areas of improvement. But I just hope we are in the right place. That's my only question. I'm not certain we are.

On the issue -- we had some very good dialogue on the first panel. One of the issues that came up in that panel was raised by Ms. Silverstein. That is on her slide 8 regarding protecting the power plant, and the issue of the voltage at the interface of the plant to the grid, how do we -- what kind of requirement do we have for that, how do we ensure that we have what is necessary to protect the plant yet perhaps be somewhat more flexible in terms of the full grid operability.

And I was wondering, on the part of the staff and separately on the part of Mr. Calvo, if you could, perhaps, give me some reactions to that in terms of your thinking.

Ronaldo, if you want to take a crack at that first.

MR. JENKINS: Going back to the initial licensing of various plants. They were pretty much developed as independent units interfaced with their respective grid connections.

And as time has gone along, the transmission system folks have done a particularly good job of trying to optimize relay.

The staff really does need to look at the relay set points. But where it's kind of caught in a Catch-22 here because on the one hand we have licensees' plans for these given set points. And we as a regulator are looking for the licensee to come forward and to make those change. To say, okay, given this context here, we can now operate with greater flexibility. That will allow us to then have to look at it and say, okay, from a safety point of view, these changes are okay. We can make them.

COMMISSIONER MERRIFIELD: Just so I understand. That get to the issues raised by Mr. Crane and Mr. Dugger, that they are going to do what the tech specs say but they may be coming back to us at some point and saying, we think there's a better way of the agency looking at those tech specs that will meet the safety concerns of the NRC, yet at the same time, give them some greater degree flexibility in terms of meeting their production needs.

MR. JENKINS: Our emphasis is primarily on the safety end. And the industry or the particular licensee has to take the initiative to approach the staff and say, okay, here are our changes we need in order to obtain greater flexibility.

And at least as long as I have been here, we have been open to those kind of changes.

So as Mr. Calvo has eluded to, it's something that we should continue to communicate our openness to be receptive to change.

MR. CALVO: For the last two weeks I spent -- me and my staff went up to the Midwest ISO, and we went to New York ISO recently.

The hand shakes -- the independent system operator. This is the one who does -- the reliability coordination for NERC sometimes they stay at those particular ISOs. And then they talk to the control areas which in turn, they talk to the TOs or the transmission operator. And they've got contractuals.

So if the ISOs found a problem without meeting the first contingency, they talk to the control area, the control area to the transmission, and they, in turn, talk to the nuclear power plant. If any of those links is broken some kind of way, the nuclear power plant will never know about the status of the grid.

He could very well start -- or take some piece of the equipment. So it's very important that those agreements, those contractual profiles -- we asked them, isn't it a financial incentive -- suppose that something will happen out at the plant, will they collect from the loss of revenue of it.. It had not quite got to that point.

The way the grid has changed is everybody is depending on each other. It's very important that they talk to each other.

Now, the end result of this, the tech specs that we have today it was done at a time when the utility was vertically integrated. They controlled their own destiny. They could do what they want to do. They controlled the customer base.

It's not good anymore. It's at the mercy of the ISO, mercy of the control area, at the mercy of the transmission operator and it's up to them. It's not only for the nuclear power plant. It is also for the fossil fuel.

So that coordination has got to be much better than it was before because now we are depending on them to tell us what is going on with the grid.

COMMISSIONER MERRIFIELD: So to circle it back around. Relative to the suggestions made by our counterparts at FERC, there's nothing that we have that would preclude having that dialogue about changing the tech specs?

That is something that falls on the responsibility of the licensee to bring to us. And I take it from the conversation that you are having right now, that a lot of this is also focused on the communications ability of the licensee and its interactions with -- in its contractual relationships to be able to demonstrate to us that they have a sufficient knowledge about the grid situation where they can demonstrate to us that those tech spec changes are warranted? Does that capture it fairly?

MR. CALVO: The knowledge is there. We have found some broken links. The ISO cannot communicate with the generation -- they cannot. It's absolutely prohibited. They have got to go back to the lower tier and that's the one who communicates with us.

We had an opportunity to talk to some of the control areas. And we asked them, do you know where the nuclear power plants' requirements are? Some they do. Others do not.

They are still negotiating those protocols. They have got to negotiate in such a manner that everyone understands each other.

And so again, because of the competition between transmission generation, the use of lines of communication to talk, they are a little reluctant to. But they have got to do it in this case where it has to do with support for ensuring the safety of the nuclear power plants. They say they are all aware, but we will verify soon whether they are truly implementing this thing and have the procedures to back them up.

MR. JENKINS: One caveat is that there is a considerable variability between ISOs and control areas as you go around the country.

COMMISSIONER MERRIFIELD: Well, in our further ability to communicate with our counterparts at FERC, maybe we can get some suggestions about how that level of communication that we want to have can be enhanced so we can let people know how important it is for the plants that we regulate.

Mr. Calvo, you made a variety of different recommendations. And I think certainly we will take a look at those. I appreciate all the work that you put into those. I would note -- you had in your slides, I think it was brought out today, I think we need to do more work on the MOU's, which I think is a positive thing coming out of this meeting.

Are there any other gaps between the recommendations you presented today and the staff's action plans? Do you have any thoughts in terms of how we might address some of those issues? I understand your recommendations, but are there some gaps there that perhaps you may want to talk about?

MR. CALVO: I think today we are moving forward trying to determine awareness of the nuclear power plants in the summer of 2004. But that only takes about one-third of all the issues that have been collected and received; one-third.

The other two-thirds I think -- one-third of it I think, FERC and NERC are taking care of that. It's still that other one-third that is left. This is the long look, being proactive. What can we do? How we prepare ourselves. Assume the worse condition and be prepared for it. Do we have to do something to the onsite power system?

We can say, are we going to have a promise from the grid operator that it's going to be reliable all the time?

They are not adding any transmission lines. They are not adding any new generation. All we are doing is being aware. You can be aware for so long. You are going to have to do something maybe to correct the situation or maybe not. The awareness is going to help you this summer. But you should be looking ahead to the future.

COMMISSIONER MERRIFIELD: What I take from what you are saying is as far as putting our plans in place for dealing with the issues this summer, we are in pretty good shape.

MR. CALVO: That's correct.

COMMISSIONER MERRIFIELD: That's the third.

For other third that's NERC and FERC, we need to communicate with them better.

What you are saying is we need to continue to follow through to, at least, get our way through. Now, there may be differences as to how we approach that in the end. But we need to be thinking about that long range. That's really the message that you are trying to give?

MR. CALVO: Correct.

Also you are saying the plants are going to be ready. We hope that they are going to be ready. I'm expecting for them to be ready.

If we find that some of them are not ready, and I hope we find very few of those, I believe that can be corrected.

COMMISSIONER MERRIFIELD: We are doing the most important things immediately?

MR. CALVO: Right now. For the summer.

COMMISSIONER MERRIFIELD: For this summer?

MR. CALVO: Yes. The awareness is the most important. We trust them but we need to verify. And that's what we are doing now. We are verifying.

COMMISSIONER MERRIFIELD: I appreciate that. I think the message is going out to our licensees that, for example, with things such as heavy diesel overhauls, doing that in the middle of the August doesn't seem to make a lot of sense, given the information we now have available. I'm glad to hear that we are getting that out.

Mr. Chairman, thank you.

CHAIRMAN DIAZ: Thank you, Commissioner Merrifield.

Just back up to the staff for a minute. I know that we have been doing now risk analysis of offsite power losses for some time. And we put them into the ASP program. What were the results of the ASP risk analysis for the August Blackout specifically?

MR. CHEOK: I guess obviously all eight plants successfully coped with the event. Given the fact that there were no major equipment failures, the ASP results showed that we had conditional core damage probabilities that I expected.

We have seen ten to the minus four probabilities of CCDPs for plants in the past for loss of offsite power. And for these eight plants, we have five plants that are slightly above ten to the minus four. And we have three plants that were below ten to the minus four.

So given the fact that there were no major equipment failures, we are seeing the results that we expect from these eight plants.

CHAIRMAN DIAZ: Any lessons learned from the analysis from these plants that were slightly above ten to the minus four?

MR. CHEOK: The lessons learned, were mentioned already, that the duration of loss of power is important. For these eight plants, we have seen durations vary from one hour to six hours. Obviously, the ones with the greater durations come up with the higher risk.

And there were three plants that had slight equipment problems. Those plants tended to be on the higher side.

And last but not least is the bad recoping capability. Plants with a longer coping capability are the ones that would do better in terms of risk.

CHAIRMAN DIAZ: You know, I think today everybody's concern is grid reliability. However, Mr. Collins, of course, NRR has many other areas of concern. We have been talking the last few weeks about vessel head corrosion, steam dryers, cracking steam generators, the materials problems. And there's a long list.

And, in fact, I think I added to your headaches the other day, which I am very glad I did.

MR. COLLINS: We have your list.

CHAIRMAN DIAZ: Very good. Thank you, sir.

Now, where in the priorities as far -- and I think it goes to the question of Commissioner Merrifield -- is the issue of grid reliability, do we have enough resources and attention to be able, for example, to give our best resolution to the issues of this summer reliability? Do we have a plan in place that will keep resolving the issues over the long term?

MR. COLLINS: I will let Rich Barrett, who is the senior manager in charge of the integration respond to that. In fairness to Commissioner Merrifield's question, when the task force was ongoing -- and I think Jose had a concern with this also -- we tried to be very careful not to overlap the electrical working group's responsibilities. Because they were looking at the interface between the generators and the providers.

Once we determined that, on a preliminary basis, there was no immediate safety concern, we backed off a little bit from going there until the electrical working group as part of the international effort -- or the integrated national effort, rather, was done.

Then we took those initiatives and moved them forward.

So, again, that was a decision of how we were going to integrate the processes. And it did result in some delay in consolidating the issues.

So that is partially in response to your question. Thank you.

MR. BARRETT: First of all, I would say that this issue, in our minds, ranks up there with the ones that you have mentioned.

We have looked at the issue from the point of view of its risk sensitivity of the issue. We don't have risk analyses, per se, because we don't know right now whether the August 14th outage is an isolated event, something that we will look back with in years to

come or whether these are enduring problems that will continue to give us losses of offsite power.

But it certainly is an issue that we regard to be right up there among those others that you have mentioned in terms of the risk significance.

The issue today is getting the full attention of our electrical people in NRR and the full support of a variety of people in the Office of Research as well. And we will continue to do that as we go through the summer and we begin to get a sense from our TI as to how well this is being managed by the licensees.

We get a sense from the NERC survey as to how well the grid is being managed and as we go out into the future. And we learn more about how these recommendations, such as the legislation, how that turns out.

I think we will have a better sense of whether -- as I said -- whether this is a long-term risk issue that will require significant resources over time or whether this is something that can become more of a normal type of an oversight process.

CHAIRMAN DIAZ: Of course, the Commission will be interested in being very aware of where are we. Because it might be that legislation -- which everybody agrees the best thing might not be here -- in the meantime, we have obligations that we need to fulfill. And so we need to have plans that will allow us to address these issues.

Let me just make a point -- and if someone wants to comment it's fine. I think the issue of cyber vulnerability -- we keep going back and forth. I think what we know and it's well recognized that nuclear power plants are really not -- very little vulnerability to cyber attacks themselves. You know, our safety systems are separated from the data systems. There is really -- that's not an issue.

The only issue that comes from cyber vulnerability is the grid reliability itself and how our electrical systems in our -- the plant transformer back yard and so on, how they can be affected.

So we do seem to have a good firewall -- if you want to -- around our plant. It is what -- how the electrical systems are affected whether cyber vulnerability is correct.

Care to comment on that?

MR. CALVO: I can try. I've been working with NSIR.

I think if the presumption of reasonable assurance considers offsite power, we have the backup system. We have got the diesels and we have got the other diesels. But again, if you challenge those systems too many times, and then you wonder whether you have the vulnerability that you needed so you can make it every time without worrying about core damage.

So the concern that I think the FERC has and I have it, is the fact that -- because they are using computers now for all of these patching. As a matter of fact, in the New York ISO 50 percent of that.

If somebody else can hack into those computers, you can be effecting all of those generators who can ask for more power than you can deliver and there goes the grid with it. That will have impact until loss of offsite power is available to nuclear power plants. The question is if you do it one time, maybe you will be forgiven. But if you do it constantly, once a month or whatever it is, it is going to create a problem on the availability of offsite power to the nuclear power plant.

So that's important. Even though it's outside of our territory, we would like to know what it's being done in what is called the SCADA systems. That is what we are trying to find out.

You are right. The nuclear power plants are well protected. We have got the backups. But the question is, we don't want to challenge those backups so much.

CHAIRMAN DIAZ: We certainly don't want to challenge. Of course, you just touched on one of my pet peeves, which is, in a reasonable assurance, doesn't mean zero risk.

MR. CALVO: I agree

MR. COLLINS: We have Mr. Joe Shea from NSIR who is representing cyber security for us.

MR. SHEA: Mr. Chairman, with regard to the prospective on the current relative vulnerability of safety systems at power plants, I would agree with your assessment. It's slow.

One of the things that we are looking closely at as we move forward with building out our programming and working with NEI is the future as licensees change out components with more and more digital systems, even in the safety area, that they are aware of the kind of pitfalls and problems that can be left in the systems as they go forward and look at those as we build our program.

CHAIRMAN DIAZ: Thank you.

Mr. Calvo, thank you. You have gone through many recommendations, I think. You know, we have and will continue to consider them very seriously. I have seen

some things match some of the other things. Others will require the Commission deliberation on it.

There's one that you might call it a little bit out of what we call -- the way we do things around here, which are more familiar than I am, which is this issue of the ombudsperson.

I think the Commission has always been very clear that there is no doubt that we encourage our staff to submit their opinions.

When they are different, we have different professionals views. Do you think that that program -- and especially the way that it's been strengthened, is sufficient to be able to address the concerns that you or any of our staff has? Why do we need to go and do something different?

MR. CALVO: I have got a sense of what you are trying to do, the nonconcurrence process that you want to build into the picture.

Put yourself in a position that a member of the staff brings a issue and management all the way up to the office director or the EDOs is saying, no, no. I don't agree with you, this is it. And then that issue is carried with the Commission paper to the Commission. Then you rule in favor of that member of the staff. How do you think the management below that person all feel about it?

I don't care. We are all human beings. We have personal feelings. Some people take it better than the others. Some people will resent it.

What I'm saying, when you bring in an ombudsman, you remove all that from there. Okay, they've got an issue. You decide in favor of the staffer. Maybe get someone else and see if you can reconcile those differences.

Keep in mind, when that person gives you the nonconcurrence, he tried. And he tried. Some kind of way he can't go through it. And all of a sudden when you have to elevate it that way, maybe you need a new fresh look. And that is where the ombudsperson -- he will give you that fresh look.

You are right. You have got those processes in place. But the human feelings, the personal part that people feel about these things, sometimes they get there. Sometimes they delay you resolving some of those issues.

CHAIRMAN DIAZ: I hear you. I think I heard it many times.

And if they mean it, the senior staff keeps saying when the Commission decide, they salute and they go forward.

The second thing is, we don't allow retaliation at all in this agency. None whatsoever by nobody. So I think those are very two good things.

And with that I think I used my time.

Commissioner McGaffigan?

COMMISSIONER McGAFFIGAN: Thank you, Mr. Chairman. It wasn't where I intended to start but I will start where you left off and maybe turn to Mr. Collins because I think it's in his jurisdiction.

You eluded to the improvements that we have made or intend to make in the DPV process. And one of those improvements is awful close to an ombudsperson. And that my recollection of what we had a Commission briefing last year about the DPV, DPO process. And the staff was moving towards having a single process rather than two, having a person who worked for Frank Congel, who is sort of the keeper of that process, as he already has somebody who's the keeper of the external allegation process.

Wouldn't that person who probably hasn't been named yet who works for -- as I understand it, in the Office of Enforcement, wouldn't that be the closest thing that we would have to an ombudsperson?

MR. COLLINS: Yes. With a slight change of approach. The intent was to move the DPO process into a staff position where it's more aligned with what I would call safety management, which underneath would be safety culture, safety conscious work environment.

And to integrate into the staff the concepts, many of which we hold the licensees accountable for, for having those types of values and cultures available to them and to be able to point to where they are and how they are measured. In light of that, there's been an effort and it's been completed. There's a draft Manual Chapter that I believe is under Commission review at this point -- to move the DPV process and DPO process into a consolidated process, only the DPO.

That's meant to streamline the process and provide for one-stop shopping, if you will, and transparency for the individual. There are some other enhancements to the process.

More to the point of structure, we have moved that initiative, the old DPV and transitioned to the DPO only process into Frank Congel's office of OE with assigned resources there including a program manager in that area.

And that aligns very closely with our allegation responsibilities. We have a vision -- and at this point it's only that -- but I know we have discussed it -- of that senior individual there who happens to be an SLS position at this time, serving as a central point of contact for staff concerns.

And that individual would then be able to broker the NRC processes under that central point of contact. Call it ombudsman, if you will, but there are no disposition program responsibilities. It's only to ensure that the individuals are pointed in the right direction and monitored throughout the process.

COMMISSIONER McGAFFIGAN: I'm trying to, I guess, facilitate a discussion between you and Mr. Calvo in public but that's exactly what ombudsperson does. And so this program manager wants -- I'm not sure that the Manual Chapter, by the way, is in front of us. I think it may be that you briefed us last year and we didn't object in that Commission meeting, so I think it may be in the staff's hands to finish that Manual Chapter and get on with this new process.

The resources have been assigned. And this program manager is in place, analogous to the allegation program manager, and has the responsibilities that you outlined and previously outlined in this paper in more detail. It strikes me that that's what an ombudsperson is. An ombudsperson doesn't resolve the issue. The ombudsperson puts in place a process or helps facilitate a process for the resolution of the issue.

So again, Mr. Calvo, I don't expect you to know every Commission paper that comes up to us. That's not your responsibility down in the electrical engineering branch. But are you familiar with what they described to us last year and the intended changes in the Office of Enforcement and whether when this person, this program manager for the DPO process -- and it isn't just the DPO process, it's really more for nonconcurrences. When that person is in place, would that meet your need?

MR. CALVO: When that report went to you, I was using the Commission as the ombudsman. I was looking for the mediator to facilitate it to help to resolve the issue. And that's how it was used.

So that occurred to me. I don't want to go and tell the Commission that I have a problem resolving the issues. We need somebody else who mediates, and facilitates, who takes the personal feelings away from everybody and looks at it in a more realistic manner and makes a recommendation.

COMMISSIONER McGAFFIGAN: I honestly think we are very close to, as Chairman Diaz said, having the process in place that you are looking for.

CHAIRMAN DIAZ: It might not have the same words but the intent is to be able to resolve and facilitate. And I think we are very close.

COMMISSIONER McGAFFIGAN: So I will just reinforce that.

Let me go back to the issues that Mr. Cheok and others, Corny Holden, talked about. I want to make sure -- Corny, you mentioned -- we all agreed last year, there are five important precursors out of the eight. They exceed the ten to the minus 4 threshold preliminary data.

But you also said something -- and I took some note that, going back to -- over a longer period of time there were -- if you look at important as opposed to significant precursors, a fair number of them had to do with grid issues. Of the total number from 1994 of important precursors -- and thankfully, we don't have many important precursors today compared to the 1980's -- a significant fraction were grid related. I'm not sure who has the data better. Whoever wants to answer the question, I would be happy to have that person answer it.

MR. HOLDEN: I think I mentioned that three were the result of loss of onsite power.

MR. CHEOK: Three out of thirteen in past ten years. If you add these eight, you would almost be --

COMMISSIONER McGAFFIGAN: Do I add eight or do I add five?

MR. CHEOK: You add five because it would be -- eight out of eighteen.

COMMISSIONER McGAFFIGAN: A lot of them coming in one -- like, for instance, Calloway, was that one of the three? Did Calloway get to be an important precursor at the event they had --

MR. CHEOK: I'm not sure but --

MR. COLLINS: We can get you that information.

COMMISSIONER McGAFFIGAN: So depending on how you look at the data, this is a fair fraction of all of our important precursors. Or this is a one-time event that has pushed the fraction way high.

Okay. Well, I think it's -- I just wanted to be clear on that. I was afraid it was even higher, having heard Corny earlier. So it's three out of the thirteen, plus five out of five.

We do have Davis-Besse yet to be scored. And that will, unfortunately, I'm sure at the end be our first significant precursor in a long time.

But at the ten to the minus four, which is a ten minus three level -- at the ten minus four level we are talking eight out of eighteen. Okay.

You heard some of the discussion earlier about possible roles for the NRC in this area. And I guess I will look to Sam because you are the senior staffer present.

As you think about requirements, this is a time of fair uncertainty. Potential new requirements, if any, in this area.

It's a time of great uncertainty because we don't know whether NERC and FERC are going to be given more responsibility, whether they will be able to enforce a lot of actions that they can't currently enforce, whether that will help things.

I mean, Jose raises the issue as to whether they can get all of that authority, and still if nobody builds any transmission lines and things stay tight, you will have a tightly regulated system that has almost no give to it and we still may have problems.

But how much of what you heard earlier in the way of suggestions for possible NRC action are you comfortable with is clearly in our jurisdiction? And how much do you feel uncomfortable with, particularly in the light of the fog of future activities and future possibilities?

MR. COLLINS: I am going to rely on the technical staff to provide the details. But at this time, we have made a decision as a staff that we do not have an immediate safety concern.

The next step in accordance with the TI is to gather the information right along the lines that Jose mentioned about the communications protocol, the understanding of the maintenance rule, and the bounds of the auctioneering or the calculations, if you will, that the grid operator does and how is that communicated to the licensee and the bounds of the grid as far as stability is concerned.

I think the one area -- personally speaking -- I think the one area that we would want to monitor very closely is the bounds of the grid. And they were assumptions

made during the licensing basis of the plant over what is out there, so to speak, in the grid, what that would look like under certain conditions.

And if that has changed -- and I think that's a question that we have to answer still at this time in the data gathering section of our initiative. If that has changed, then we have to take a step back to make sure that our requirements are commensurate with that.

I do believe that the MOUs are very worthwhile. We talked earlier about staff support for NERC and some conditions under FERC. I think the MOUs can stabilize that situation. We can understand the needs. And the sharing of information, as also was mentioned here, I think, is very, very important.

And then there's the other question which is as important, if not more, is what do the licensees know at any point in time and how did they react to that.

MR. BARRETT: I think I would certainly want to say that it was a consistent message that these MOUs be the cooperation and communication between us and the grid reliability organizations can only be a plus. I think we need to know what they are doing. We need to know the status of the grid. We need to have data. If we need to track it, we need to be cognizant of it.

And that's something that we have done it informally in the past. I think it's probably time to put it on a more informal basis.

COMMISSIONER McGAFFIGAN: One of the interesting data points I heard, and I hope I got it right, Mr. Dugger if you are still in the audience. He said that this EPRI study had determined that -- I'm again looking at my notes -- the probability of offsite power events has dropped by a factor of ten compared to 1980.

These things were all licensed back in the '70's and '80's, for the most part. So this fundamental question that Sam raises is, are the plants in a situation today that is different from the way they were licensed? If that data point from EPRI is right, things are actually better today, at least -- but that may be --

MR. BARRETT: We had some interesting presentations from EPRI at our first meeting with the industry on this subject back in March. One of the things that stuck in my mind was that in the time period since deregulation has started, one of the trends that we have seen is that even during that period of time, even since the Station Blackout Rule went into place, the number of scrams has been reduced. But it's primarily the ones that have been reduced are the plant centered scrams, the ones that are of shortest duration and therefore are the ones of least concern.

I think that part of the reason why the average duration has gone up, is because the frequency of the shorter duration ones have been reduced. It's not an increase in the number of longer duration ones. The problem with all of that discussion is that you don't know how to treat August 14th.

You don't know whether to take those eight scrams and toss them into the general pool and say, this is a single statistical pool or whether this is something else that's going on.

I think that's the big question right now.

CHAIRMAN DIAZ: Excuse me. I hate to go back to my elementary statistics. But fundamentally, there's an issue which is the aggregate and the individual for each individual power plant. Still the risk did not change from the Station Blackout. It was just the number of power plants that makes it a different number.

So we still, with a lower probability and we have a larger duration. We might still be able to fit the profile that provide reasonable assurance. And that's what the staff needs to answer.

COMMISSIONER McGAFFIGAN: I agree. It's a complicated area. There are complicated interfaces. I agree entirely with my two colleagues and with the staff that we need to get these MOUs in place.

We have to get some practice as to who is responsible for what among the regulators, let alone among the parties out there trying to deliver power. And once we have that in place, clearly, deregulation is raising some potentially new issues.

In fact, nobody is building transmission lines, sort of raises issues. And yet American consumption of power goes up. There's a lot of issues for us to deal with going forward, and they could be, depending on how you interpret the data, as Rich says, they could be and maybe should be an absolutely central focus of this agency. Or they are down the list compared to Davis-Besse and materials issues. And that's for time to tell and for you all to tell us.

CHAIRMAN DIAZ: Or large preying locusts.

COMMISSIONER MERRIFIELD: I agree with that. I think one of things that comes out of this is we as an agency have, in collaboration with the licensees that we regulate, have been mindful of an environment in which we use risk management as a significant tool in analyzing how we go about regulating the plants. And the issues associated with the risks attendant to the grid play a part of that risk analysis. And we just need to be mindful that that all comes together.

It's not just the plants themselves who are doing the analysis at risk. But it is that offsite analysis, too, that needs to be incorporated into the overall assessment.

CHAIRMAN DIAZ: Well, thank you so very much. I think this was a very good meeting. In fact, I think it's so good that I am going to ask SECY to start considering when do we meet again on this issue.

I'm looking at the action plan. And there's some dates in here like re-evaluate the Station Blackout. Sometimes it seems to me like we will have a reasonably good handle by next spring.

COMMISSIONER McGAFFIGAN: And maybe just before next summer again.

CHAIRMAN DIAZ: We should be ready by then. We should have not only acted on some of the recommendations, you know, moved forward. I believe that this is an issue that is facing us every day.

As most of you know, I believe that we should put attention in those issues that are more safety significant. That's why I try to, and my fellow Commissioners have agreed, we need to take a look at some of those issues that are not right there on the scope.

This is one that we have known for a long time, that is safety significant. The very first really risk-informed rule. It wasn't called like that. It was a Station Blackout. And for very good reasons.

I think we need now to upgrade it and to be able to face it. Communications are key. You know, protocols, the way to act on it. Those are the types of things that we can do in a short time.

And I'm sure that when we work on this SRM, you are going to have a very fascinating time getting together a good set of actions.

And with that, unless my fellow Commissioners have a final comment --

COMMISSIONER MERRIFIELD: Mr. Chairman, I wanted to concur in your notion that we should seek to have another meeting down the line. I would note the staff has in their action plan the completion of a Station Blackout Rule Study in the March 15th time frame. I would suggest that if we are going to meet again next year, we do it earlier than May 10th. That might be a good time there to come back and see what the staff has done.

CHAIRMAN DIAZ: I think the cherry blossom festival is looking good right now.

MR. COLLINS: Sir, additionally, of course, the working groups is continuing, all three working groups. So it would be of interest, I believe, to understand how the other recommendations from the other working groups are also progressing. Our stakeholders would certainly be valuable in understanding that.

CHAIRMAN DIAZ: I think I can speak for my fellow Commissioners when I tell the staff that you have gotten our attention.

And with that, we are adjourned.

(Thereupon, the meeting was adjourned.)