

# BLACKOUT IN THE NORTHEAST AND MIDWEST

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HEARING  
BEFORE THE  
COMMITTEE ON  
ENERGY AND NATURAL RESOURCES  
UNITED STATES SENATE  
ONE HUNDRED EIGHTH CONGRESS

SECOND SESSION

ON THE RELIABILITY OF THE NATION'S ELECTRICITY GRID

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FEBRUARY 24, 2004



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# **BLACKOUT IN THE NORTHEAST AND MIDWEST**

**TUESDAY, FEBRUARY 24, 2004**

U.S. SENATE,  
COMMITTEE ON ENERGY AND NATURAL RESOURCES,  
*Washington, D.C.*

The committee met, pursuant to notice, at 10 a.m., in room SD-366, Dirksen Senate Office Building, Hon. Pete V. Domenici, chairman, presiding.

## **OPENING STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO**

The CHAIRMAN. The hearing will please come to order. I want to thank everyone, particularly the witnesses for giving us their time today and we assure you that it is not our intent to go on forever. We want the hearing to be concise, to the point, and as brief as possible, so we will tell you right now that we hope you can give your statements and then give a brief summary of them and we will take both into account as we move along. This is a hearing that pertains itself with the reliability of the grid. And the reliability for the nation's grid means the assurance that power is flowing safely over our electricity lines to consumers and businesses.

The energy bill provides a section that establishes an electric reliability organization, and authorizes that organization to create mandatory standards for operating the bulk power system and authorizes punishment of those who fail to meet those standards.

I thought maybe since we will just be using those words that I would make sure that everybody knows what we are talking about. Senator Bingaman, I have a brief opening statement, after which I will yield to you. Senator Thomas is the only Senator here and if he cares to open, we'll let him do that, after which time we'll proceed with all of you unless you have an emergency and then we will ask you questions after we are finished.

So today our electric grid is operating voluntarily and the rules are voluntary rules and they are set by the American Electric Reliability Council. Sometimes known as NERC. And the August 14 blackout is our most recent reminder that voluntary reliability rules did not work. Perhaps it means that these rules are no longer sufficient to ensure the safe, reliable operation of our electric grid.

In the drafting of the energy bill, which is still pending, we made that assumption based on the evidence we got, we took, that we obtained. The purpose of this hearing is to review the solutions

NERC has recommended in its February 10, 2004 report on how to prevent and mitigate future blackouts.

This discussion should help focus our attention on issues such as the fiscal constraints and requirements of coordinating the electricity system to the decision making process for developing and enforcing reliability rules. And third, the cost of reliability rules, who should bear them and the role of technology in improving reliability.

There is currently a great deal of tension and uncertainty in the industry about how we will proceed in improving our reliability. Some are concerned that the Federal Energy Regulatory Commission, FERC, will try to mandate reliability rules despite a clear lack of authority in statutes of our land to do that. This could end up tying that industry up in wasteful and lengthy litigation.

Some are concerned that NERC and industry will not act efficiently to solve the reliability problems. My answer is the best solution is for Congress to pass a comprehensive energy bill that indicates mandatory reliability rules. I think those mandatory rules are in the current comprehensive bill.

That is the solution that I'm working to accomplish. There are differences of opinion, but the difference of opinion is by those who do not think we will pass a comprehensive energy bill. That's predominantly wherein the difference lies.

I believe we have to do that. If we take this part all by itself, we have concluded that this is the most important part of the energy bill, and I think that's a pretty tough conclusion to draw. Some will make it. I think I can refute it just by looking at all the other things we ought to be doing.

The solution that I'm working on is that we owe this country a comprehensive energy bill to ensure our domestic prosperity and our national security. Senator Bingaman, I believe that you agree with my last statement that we need—that's what we need. I'm not sure that you agree with how we get there.

Having said that, I welcome you to make your opening remarks and I have already indicated how we will proceed after that. Senator Bingaman.

[The prepared statements of Senators Bayh, Cantwell, Campbell, and Craig follow:]

PREPARED STATEMENT OF HON. EVAN BAYH, U.S. SENATOR FROM INDIANA

Mr. Chairman, thank you for holding this hearing on the reliability of our electric grid. The August 14th blackout signaled that much more needs to be done to enhance the reliability of our transmission grid. However, I would like to caution my colleagues and others who are quick to jump on the reliability bandwagon as a way of hindering the further formation of Regional Transmission Organizations (RTOs). While the final blackout report from the U.S.-Canada Power System Outage Task Force has yet to be released, I read with interest the interim report which stated that "reactive" power produced by independent power operators was not the cause of the massive blackout, which stretched from the Great Lakes to the Atlantic Ocean. The Task Force points out that lack of coordination seems to be the larger culprit—coordination that will only be enhanced with seamless regional transmission organizations.

RTOs were formed to help us move to a more competitive electricity market, but as the economy grew, they played an increasingly important role in providing coordination of electricity over existing transmission lines. RTOs will continue to play an important role in ensuring that proper coordination occurs between and among utilities and independent providers of electricity. In fact, last week, in my home state, the Midwest Independent System Operator (MISO) opened its doors to dem-

onstrate upgrades made to the organization since the August blackout—upgrades that will help to deter future communication failures that certainly played a role in the spread of what otherwise may have been smaller blackout. However, if other states intervene to prevent American Electric Power (AEP) from integrating into that communication system through participation in PJM, its massive presence in the Midwest will impede the progress made by MISO to date, creating a gaping hole in the coordination in the Midwest.

Furthermore, states should recognize that if RTOs evolve in a Swiss cheese fashion they cannot fulfill the requirement to increase reliability as the use of the electricity grid continues to grow. In fact, several state public utility commissions recently filed comments to FERC supporting FERC's decision to move AEP into the PJM RTO.

The Indiana Utility Regulatory Commission noted that past rulings regarding AEP's existing makeup were dependent on its inclusion in these regional organizations. Indiana and the six other commissions that joined them in the filing pointed out the compelling economic and reliability issues in this matter are regional and multi-regional in scope and thus require regional and multi-regional solutions.

The economic benefits of wholesale electricity markets are real. A 2001 Department of Energy study of the nation's transmission grid confirms that wholesale electricity markets save consumers nearly \$13 billion per year. In testimony filed before FERC on the AEP case, Tabors Caramanis & Associates stated that in 2005, AEP integration into the PJM market would save consumers in MISO and PJM approximately \$214 million in that year alone.

I urge my colleagues to recognize the benefits of RTOs, the role they play in cost savings and reliability improvements to consumers as well as the important role that FERC can play in ensuring that they are properly formed.

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PREPARED STATEMENT OF HON. MARIA CANTWELL, U.S. SENATOR FROM WASHINGTON

Thank you, Mr. Chairman, for holding this important hearing. I look forward to learning more today about this past August's Northeast/Midwest blackout, which has again sounded the wake up call for federal electric reliability legislation.

As everyone in this room is well aware, devising a comprehensive policy that will help this nation achieve its energy independence is a task that has divided this Committee, the U.S. Senate and the Congress as a whole for three years now. Regardless, I believe that there is one thing on which everyone in this room can agree—and that is the need to pass legislation giving the Federal Energy Regulatory Commission, working closely with regional entities, the statutory authority to put in place mandatory and enforceable reliability standards.

The call for legislation of this kind dates back to at least 1997, when both a Task Force established by the Clinton Administration's Department of Energy and a North American Electric Reliability Council (or NERC) blue ribbon panel independently determined that reliability rules for our nation's electric system needed to be mandatory and enforceable.

In response, the Senate passed stand-alone legislation on this matter, authored by my predecessor Sen. Gorton, in June 2000. Since then, under the leadership of both parties, the Senate has twice passed the very provisions included in my bill, the Electric Reliability Act of 2004, as part of comprehensive energy legislation—most recently, this past July.

There is no doubt that this nation's consumers and businesses cannot afford further delay in improving the reliability of the electricity grid. However, I am of the firm belief that we cannot allow these crucial provisions to be held hostage to a flawed comprehensive energy bill.

I see Mr. Gent here today, as one of our witnesses. Mr. Gent, I read with great interest your January 1 letter to the *New York Times*, in which you wrote that NERC's recent activity to improve the reliability of our nation's grid "does not reduce the need for federal legislation that would provide authority to impose and enforce mandatory reliability standards. Whether legislation is adopted on a stand-alone basis or as part of a comprehensive energy bill, passage is essential. If reliability legislation had been enacted when first proposed [in 1999], I believe that the blackout would not have occurred."

Mr. Gent, I could not agree more. And while I know that the Chairman has worked to strip one of the most outrageous provisions of the H.R. 6 conference report—the MTBE liability protection, which many Senators simply cannot abide—from a new energy bill, I am one of the many who believe that the bill that remains requires very, very substantial revision and thorough debate. With its origins in last year's conference report, there are far too many provisions in the new bill that this

Committee has simply never considered. Moreover, if one of our primary policy goals is to improve the reliability of our nation's electricity grid, I am hard-pressed to see how many of the provisions in that bill are relevant.

- How will weakening the Safe Drinking Water Act help keep the lights on?
- Will providing MTBE producers with \$2 billion in taxpayer-funded "transition" assistance in any way reduce the likelihood of outages?
- How would delaying Clean Air Act implementation in our nation's most polluted cities ensure reliable operation of our electricity grid?
- Can anyone really argue that exempting oil companies from Clean Water Act requirements will make our high-voltage transmission lines more reliable?

This new bill might not subsidize Hooters, but there remain plenty of handouts to the polluters and corporate looters—none of which have anything to do with bolstering the reliability of our transmission infrastructure. And that's before a non-existent conference with the House, the Leadership of which has publicly expressed its complete disinterest in revisiting the provisions of H.R. 6 most objectionable to the Senate.

So I am pleased we are having this hearing today, but I have to say at the outset I reject the notion that passing comprehensive energy legislation—such as it is—is the sole path to improving the reliability of our nation's electricity grid. We can pass stand-alone reliability legislation. We've done it before. We can—and must—do it again. Good energy policy must not be held hostage to the bad, and I will look for every opportunity to move this legislation forward.

Thank you, Mr. Chairman, and I look forward to the testimony of today's witnesses.

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PREPARED STATEMENT OF HON. BEN NIGHTHORSE CAMPBELL,  
U.S. SENATOR FROM COLORADO

Thank you, Mr. Chairman. I would like to thank you for holding this hearing and all of the witnesses here to testify. This hearing will delve into the problems stemming from last summer's blackout in the Northeast. It will be interesting to see how we are going to proceed to remedy the problems nation's electricity reliability, especially as we have experienced similar problems around the country in the last few years.

While we have been fortunate in our state to escape the power outages that have plagued various regions of the country, we also know that we are not immune to such crisis. As you all know, many Western states are joined together in one huge power grid. We are interdependent to the point that the breakdown of a generator in one part of the grid will affect power in another part. As well, the entire Western grid's electric system is under severe stress. High prices and insufficient supplies of energy will no doubt burden many Western states for years to come. However, the long-term problem is the supply of electricity which is smaller than the demand in the region. Also, many states have not built new power generation facilities which would help alleviate the increasing demand for electricity, in years.

The Western power grid is already overworked because of the energy needs created by booming economies and population growth.

As we all know, with the soaring prices of electricity and the environmental concerns surrounding coal-fired generation plants, natural gas will play a key role in supplying our nation with sufficient power. But, my home state of Colorado, along with other Western states, has had problems with natural gas as well. In fact, in Colorado, we have seen our natural gas prices increase over triple in the last several months, resulting in skyrocketing residential utility bills.

I am monitoring the blackout debate carefully so that the best interests of my home state are not compromised. I have some questions for the witnesses that I would like them to address so that we can examine this issue further during the time for questions.

Thank you, Mr. Chairman.

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PREPARED STATEMENT OF HON. LARRY E. CRAIG, U.S. SENATOR FROM IDAHO

Mr. Chairman, thank you for the opportunity to address the state of our nation's transmission grid in the wake of the August 14, 2003, Northeast-Midwest electricity blackout. The task of fully understanding what happened so that we can help ensure nothing like that happens again is of critical importance to this Committee.

It is my hope that today's discussion will focus on the technical issues associated with the reliable operation of the electricity grid. I do not want the reliability issue

to be hijacked by discussions of competing agendas on market design and other restructuring issues. Such discussions have proved to be, and likely will continue to be, wholly unproductive in reaching solutions to growing reliability problems. We must get the reliability problems solved.

Personally, I think that reliability is a straightforward issue—is the country investing enough in the grid and how do we ensure that necessary investments are made? My concern is whether enough money is being spent on maintenance, state-of-the-art equipment, and training—the nuts and bolts of running the most technologically advanced electricity system in the world.

These questions should not take a back seat to questions of market design and other contentious restructuring issues. I believe that if you have the proper technology in place along with adequately trained personnel that you can operate reliably under either the Regional Transmission Organization model or the traditional vertically integrated utility model.

I hope this hearing will stay focused on those issues and avoid distractions. Thank you, Mr. Chairman.

**STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR  
FROM NEW MEXICO**

Senator BINGAMAN. Thank you very much, Mr. Chairman, for holding the hearing. I think it's a very important hearing. As I see it, we are trying to determine two things at this hearing. First of all, what caused the blackout to the extent that that's known, and second, what actions can we take to prevent future blackouts. And obviously the adverse economic and personal consequences that resulted from in those blackouts.

I believe it is very important to have a system of rules of enforcement to ensure reliability, and that's part of what is in the pending legislation and the legislation we earlier passed in the Senate.

I also believe, however, that it's important that the organization of the system operators be appropriate. Let me just indicate that I'm very pleased that we have the heads of two of the ISOs here testifying today. It seems to me that we need to understand the ability of those organizations to operate and control a system in order to ensure that reliability is there. And that I think is part of the solution and I'd like to be sure that we hear from them as to that aspect of it.

I think this is a very useful opportunity for us to go back and review some of these issues and be sure that whatever legislation we pass is constructive, and that whatever can be done short of legislation is being done. Thank you very much.

The CHAIRMAN. Thank you very much, Senator. Senator Thomas, would you like to make a few remarks and then Senator Landrieu, would you like to make a few remarks? Or do you want to go on to questioning. All right. Senator.

**STATEMENT OF HON. CRAIG THOMAS, U.S. SENATOR  
FROM WYOMING**

Senator THOMAS. Just very brief. I remember your brevity warning, so that will be good. I thank you for having this, this hearing. It was just 5 years ago when I introduced a bill that had many of these provisions in it, as a matter of fact, and some were in our energy thing.

Certainly, it talked about having mandatory regulations. It talked about the formation of regional RTOs so that we would have a way to operate on a regional basis. It also pertained to all utilities, which I think has been one of our problems. Bonneville Power

controls about 75 percent of the transmission in one of the particular areas and is uncovered.

So if we are going to do some things, we probably have to, we have to take a long look at that. I'm very much a supporter of RTOs. It lets us have some uniqueness in areas but yet brings it together with the national grid and I think that's very important.

I guess the thing we really all need to understand is that our system is clearly changing and congestion is increasing dramatically. We are doing more and more in generation. If we want to have the best kind of generation, we have to get out into the market. And so I think, I think we are faced with the real issue here and we need to move forward to do it, so thank you for being here and I appreciate having this hearing.

The CHAIRMAN. Thank you very much. Yes.

**STATEMENT OF HON. MARY L. LANDRIEU, U.S. SENATOR  
FROM LOUISIANA**

Senator LANDRIEU. Just a very brief statement. I thank the panelists for participating this morning and the chairman for calling this very important timely meeting. But representing Louisiana and the Louisiana region in terms of electricity and power, we have long enjoyed fairly low market rates for our power, robust capacity to generate that power, and have not experienced any of the shortages or blackouts associated with some of the other regions.

I have read with interest the summary, and am looking forward to working with the chairman on some solutions, but recognizing that whatever our region is doing, it's doing it pretty well and whatever we move to needs to be fair to those regions like ours that produces and generates a lot of energy and is a net exporter of energy and electricity. Thank you.

The CHAIRMAN. Thank you very much, Senator. We are going to proceed with the witnesses, but I want to go out of line and speak for a moment with you, Mr. Glotfelty. What is your title in the Department of Energy?

Mr. GLOTFELTY. I am currently the Director of the Office of Electric Transmission and Distribution.

The CHAIRMAN. I understand that you're currently failing to carry out directions included in fiscal year budget of Energy and Water regarding the funding of your office. From what I understand, you object to some of the specific direction given to you in that law. And are instead proposing to reduce funding for such items as superconductivity—I should say superconductivity research—to make up for what you perceive as shortfalls in other areas.

Now, I want you to know that that will destroy the program with a great chance of providing a real huge increase in the capacity of transmission lines. We can't ignore that potential for solving transmission bottlenecks and replacing existing lines, with lines that could carry 100 times the current amounts of electricity.

So I say to you that—let me simply warn you not to shrug off the Congress. If you do, I assume that your budget problems have just begun. There are a lot of deserving programs at the Department of Energy, and I must tell you, you may think so, but we think we could use the money that you currently use and that fund

you, we think we could use it elsewhere in the serious demand, especially for basic science and research.

Now, I am through with that observation. I do not need any comment unless you want to make it.

Mr. GLOTFELTY. I would like to if I have a moment.

The CHAIRMAN. Please do.

Mr. GLOTFELTY. Senator, Mr. Chairman, first I want to say I very much appreciate your impassioned support for superconductivity. I likewise am a tremendous believer in that technology that it is one of the Holy Grails of electricity to transmit it without impedance.

I will work with you and your staff and the budget folks within the Department of Energy to try and achieve our common goals. I am a believer in superconductivity and its goals on the grid, and I just look forward to working with you in your role as chairman of this committee, as well as the Energy and Water Appropriations Committee to make sure that we can move this technology to deployment on the grid, and do not leave it as a stagnant technology that the Government works on. So I look forward to working with you and your staff in this area.

The CHAIRMAN. I thank you very much. I do not know you at all, so it's very strange that you know what I am passionate about, what I am not passionate about. You merely said I was passionate about this program. You do not know me very well, because I'm passionate about a lot of programs in the energy bill and a lot of them in the appropriations of Energy and Water, so I do not approach this from any passion.

I approach it that we worked on something for 20 years, started in Ronald Reagan's time with a few centers, one of which was there. And we went from a little half inch to being able to build cables. Now, it would seem to me that nobody would want to close an office that has made that much strides, and I do not choose to ask every electric executive in the country. I just choose to tell you what I have told you. I thank you for your remarks and we will now proceed.

The next witness, the witness will be Michehl Gent. That's the president and CEO of the North American Electric Reliability Council. It's NERC. And they set voluntary standards, they set voluntary standards for the grid and is comprised of 10 reliability councils across the United States, Canada and a portion of Mexico. Would you please proceed?

**STATEMENT OF MICHEHL R. GENT, PRESIDENT AND CEO,  
NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL**

Mr. GENT. Yes. Good morning, Mr. Chairman and members of the committee.

Thank you for this opportunity to describe the actions taken by our NERC board of trustees on February 10 to ensure that a black-out like the one that occurred last August 14 does not happen again. I will skip over much of the background material that I have presented in my written testimony, and hope that you have time to go through that and go directly to the resolutions of our board.

When implemented, these initiatives will move NERC many steps closer to being the electric reliability organization envisioned

by the legislation that you spoke of earlier. The board recognizes that we must do everything we can to regain the public's trust and to provide reassurance that the reliability of the bulk electric system is of paramount importance to the electric utility industry.

Here's what we have to fix. Our investigation found that several entities violated NERC operating policies and planning standards. We found that the existing process for monitoring compliance with reliability standards is inadequate. We found that operating entities have adopted different interpretations of their functions and responsibilities. We found that problems identified in previous blackouts have gone unfixed and repeated.

We found that data being used in models is inaccurate. We found that planning studies are not consistently shared and are not the subject of adequate peer review. We found that system protection technologies are not consistently applied. We found that communications between system operators is not always effective. The key finding that is of greatest concern to me is that the existing NERC reliability standards were violated and that this contributed directly to the blackout. I'm also very concerned that the problems identified in previous blackouts were repeated. We must do better than this.

The actions that the board has taken fall into three categories. Near term actions, where we have asked the parties that were directly involved in the blackout to remedy specific deficiencies by the summer.

The second category is what we are calling strategic initiatives. These are programs to strengthen compliance with existing reliability standards and to track the implementation of those recommendations to ensure that they are in fact implemented.

And finally, we have technical initiatives which will probably take a very long time. They deal with evaluating designs, models, practices and training to prevent future cascading blackouts. At full copy, in fact, all 25 pages of the board's actions are an attachment to my written testimony.

These actions are both short and long term, and they are both very specific and in some cases general. I'd like to specifically mention one of the initiatives that I believe will be the most effective of all the initiatives. And that is what we are calling the control area and reliability coordinator readiness audits.

A control area is an electrical area bounded with electronics that includes generation and demand that's kept in balance at all times. A controller is also asked to balance the frequency of the network so they contribute to keeping it at 60 Hertz.

A reliability coordinator is a step above that. They are charged with in many cases several control areas. They have a wide area of view of the interconnection and their only job is to make sure that reliability is maintained.

More on the audits. We have currently a program to audit new control areas to determine that these candidate control areas are ready and suitable to become certified as NERC control areas. Existing control areas were grandfathered. No more.

Beginning March 1, we will audit all control areas and reliability coordinators. We have expanded the audit criteria to include evaluation of reliability plans, procedures, processes, tools, personnel

qualifications and training with immediate attention given to the issues that we uncovered in the blackout investigation.

We have started with the largest control areas first so that we will have audited control areas covering over 80 percent of all the customers in the United States and Canada by summer. These readiness audits will not stop there. They will be repeated on a cycle of every 3 years.

The set of recommendations that the NERC board has adopted I believe you'll find is aggressive. Right now we are able to accomplish much because we have the strong support of all the chief executives from all parts of the industry, as well as the attention of all the participants. Everyone is now focused on reliability but we are still very close to the events of August 14.

With the passage of time we are worried that priorities will shift, people will move on, other issues will compete for our attention and your attention. Having the reliability legislation in place will make sure that we can maintain the proper focus on reliability on an ongoing sustainable basis.

Thank you, and I look forward to your questions.  
[The prepared statement of Mr. Gent follows:]

PREPARED STATEMENT OF MICHEHL R. GENT, PRESIDENT AND CEO,  
NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Good morning, Mr. Chairman and members of the Committee. My name is Michehl Gent and I am President and Chief Executive Officer of the North American Electric Reliability Council (NERC). The August 14 blackout that affected eight states and two Canadian provinces was a seminal event for the entire electric industry. Thank you for this opportunity to describe recent actions by NERC's independent Board of Trustees to ensure such an event does not recur.

Before doing so, however, I must say that Congress can take one very important step to ensure we do not have a repeat of August 14. That step is to pass reliability legislation to make reliability rules mandatory and enforceable for all owners, operators, and users of the bulk power system. Legislation to accomplish that is included in H.R. 6, the comprehensive energy bill that has already passed the House. Senator Domenici included that same language in S. 2095, the slimmed-down version of a comprehensive energy bill. That language enjoys widespread support from all parts of the industry, as well as customers and regulators. I believe that if the reliability legislation had been passed two years ago, we would not have had the August 14 blackout.

NERC is a not-for-profit organization formed after the Northeast blackout in 1965 to promote the reliability of the bulk electric systems that serve North America. NERC's mission is to ensure that the bulk electric system in North America is reliable, adequate, and secure. NERC works with all segments of the electric industry as well as electricity consumers and regulators to set and encourage compliance with rules for the planning and operation of reliable electric systems. NERC comprises ten regional reliability councils that account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico.

NERC has been an integral part of the joint fact-finding investigation into the August 14 blackout conducted by the U.S.-Canada Power System Outage Task Force. NERC fully supports the task force's findings and conclusions, which were laid out in the November 19 interim report. With respect to what happened on August 14, the key findings and conclusions are detailed on page 23 of that report, as follows: "inadequate situational awareness at FirstEnergy Corporation," "FirstEnergy failed to manage adequately tree growth in its transmission rights-of-way," and "failure of the interconnected grid's reliability organizations to provide effective diagnostic support."

Immediately after the onset of the blackout on August 14, 2003, NERC assembled a team of the best technical experts in North America to investigate exactly what happened and why. Every human and data resource we have requested of the industry was provided, and experts covering every aspect of the problem were volunteered from across the United States and Canada. In the week following the blackout,

NERC and representatives of DOE and the Federal Energy Regulatory Commission ("FERC") established a joint fact-finding investigation. All members of the team, regardless of their affiliation, have worked side by side to help correlate and understand the massive amounts of data that we have received. We have had hundreds of volunteers from organizations all across North America involved in the investigation. NERC continues to provide technical support to the bi-national task force that is developing its final report.

To lead the NERC effort, we established a strong steering group of the industry's best, executive-level experts from systems not directly involved in the cascading grid failure. The steering group scope and members are described in Attachment A.\*

NERC acted to guard against a recurrence of the August 14 outage even while our investigation was continuing. Based on preliminary information from the investigation, NERC issued a request on October 15, 2003, to all reliability coordinators and control areas in North America. That request begins:

The reliability of the North American bulk electric systems, including the avoidance of future cascading outages, is of paramount importance to NERC and its stakeholders. Pending the outcome of the final report on the outage, NERC emphasizes to all entities responsible for the reliable operation of bulk electric systems the importance of assuring those systems are operated within their design criteria and within conditions known to be reliable through analytic study. If the power system enters an unanalyzed state, system operators must have the authority and the capability to take emergency actions to return the power system to a safe condition.

NERC requested that each reliability coordinator and control area in North America review a list of reliability practices that the investigation associated with the blackout to ensure their organizations are within NERC and regional reliability council standards and established good utility practices. NERC further requested that within 60 days, each entity report in writing to their respective regional reliability council, with a copy to NERC, that such a review has been completed and the status of any necessary corrective actions. That list included things such as voltage and reactive management, reliability communications, failures of system monitoring and control functions, emergency action plans, training for emergencies, and vegetation management. (The October 15 letter is attachment B to this testimony.)

NERC received responses from 166 of the 168 reliability coordinators and control areas. Almost all entities considered themselves to be in compliance with NERC reliability rules. A number of entities identified areas where they could make improvements and described the measures they were taking.

NERC's Board of Trustees has now reviewed the findings of the August 14 blackout investigation. Based upon that review, the board ordered NERC to implement a set of recommendations prepared by the steering group that directed NERC's blackout investigation. The board recognizes that we must do everything within our power to regain the public's trust and provide reassurance that preserving the reliability of the bulk electric system is of paramount importance to NERC and to the electric industry as a whole.

NERC's investigation concludes that:

- Several entities violated NERC operating policies and planning standards, and those violations contributed directly to the start of the cascading blackout.
- The existing process for monitoring and ensuring compliance with NERC and regional reliability standards was inadequate to identify and resolve specific compliance violations before those violations led to a cascading blackout.
- Reliability coordinators and control areas have adopted differing interpretations of the functions, responsibilities, authorities, and capabilities needed to operate a reliable power system.
- Problems identified in studies of prior large-scale blackouts were repeated, including deficiencies in vegetation management, operator training, and tools to help operators properly visualize system conditions.
- In some regions, data used to model loads and generators were inaccurate due to a lack of verification with actual system data and field-testing.
- Planning studies, design assumptions, and facilities ratings were not consistently shared and were not subject to adequate peer review.
- Available system protection technologies were not consistently applied to optimize the ability to slow or stop an uncontrolled cascading failure of the power system.

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\*All attachments have been retained in committee files.

- Communications between system operators were not effective and hampered their ability to recognize the developing system emergency.

A key finding of NERC's investigation, and of greatest concern to me, was that existing NERC reliability standards were violated, and that this contributed directly to the blackout. I am also very concerned that problems identified in studies of prior large-scale blackouts were repeated. We must do better than this.

Despite the absence of the reliability legislation we have been seeking, the board has determined that NERC must use all available means to obtain full compliance with its reliability standards. We have also committed to ensure that there is greater visibility given to those who violate NERC reliability standards. Specifically, the board resolved to:

- Receive detailed information on all violations of NERC reliability standards;
- Act to improve compliance with NERC reliability standards;
- Provide greater transparency to violations of reliability standards, while respecting the confidential nature of some information and the need for due process; and
- Work closely with the Federal Energy Regulatory Commission and other applicable federal, state, and provincial regulatory authorities in North America to ensure that the public interest is met with respect to compliance with our reliability standards.

To address the deficiencies found in the investigation, NERC's recommendations fall into three categories: near-term actions parties must take to remedy specific deficiencies before this summer; strategic initiatives to strengthen compliance with existing reliability standards and to track the implementation of recommendations from this and other outage investigations; and technical initiatives to prevent or mitigate the impact of future cascading blackouts. (A full copy of the board's actions is Attachment C.)

#### *Near-term Actions*

1. Correct the Direct Causes of the August 14, 2003, Blackout.
  - The companies implicated in the blackout are directed to complete specified remedial actions and certify that these actions have been completed.
  - NERC will assign experts to help these companies develop plans that adequately address the issues identified in this report, and for any other remedial actions for which they require technical assistance.

#### *Strategic Initiatives*

2. Strengthen NERC's Compliance Enforcement Program.
  - Each Region will report all violations of NERC operating policies, planning standards, and regional standards, whether verified or pending investigation.
  - If presented with evidence of a significant violation, the offending organization must correct the violation within a specified time. If an organization is determined to be non-responsive and presents a reliability risk, NERC will request assistance of the appropriate regulatory authorities.
  - NERC will review and update all compliance templates applicable to current NERC reliability standards.
  - NERC and ECAR will evaluate violations of NERC and regional standards and develop recommendations to improve compliance with reliability standards.
3. Initiate Control Area and Reliability Coordinator Reliability Readiness Audits.
  - NERC and the Regions will establish a program to audit all reliability coordinators and control areas, with immediate attention given to addressing the deficiencies identified in the blackout investigation. These audits shall be completed within three years, with the 20 highest priority audits to be completed by June 30, 2004.
  - NERC will establish a set of baseline audit criteria that will include evaluation of reliability plans, procedures, processes, tools, personnel qualifications, and training.
  - The Regions, with input from NERC, will audit each control area's and reliability coordinator's readiness to meet these audit criteria.
4. Evaluate Vegetation Management Procedures and Results.
  - NERC and the Regions will initiate a program to report all transmission line trips resulting from vegetation contact.
  - Each transmission operator will submit an annual report of all vegetation-related high voltage line trips to its Region.

- Each transmission owner shall make its vegetation management procedures and documentation of work completed available for review and verification.
5. Establish a Program to Track Implementation of Recommendations.
- NERC and the Regions will establish a program to document the completion of recommendations resulting from the August 14 blackout investigation and investigations of other historical outages, reports of violations of reliability standards, results of compliance audits, and lessons learned from system disturbances.
  - NERC will establish a program to evaluate and report on bulk electric system reliability performance.

*Technical Initiatives*

6. Improve Operator and Reliability Coordinator Training.
- All reliability coordinators, control areas, and transmission operators shall provide at least five days per year of training and drills in system emergencies for each staff person with responsibility for the real-time operation or reliability monitoring of the bulk electric system.
7. Evaluate Reactive Power and Voltage Control Practices.
- NERC will reevaluate the effectiveness of the existing reactive power and voltage control standards and how they are being implemented in practice, and develop recommendations to ensure voltage control and stability issues are adequately addressed.
  - ECAR will review its reactive power and voltage criteria and procedures and verify that its criteria and procedures are being fully implemented in regional and member studies and operations.
8. Improve System Protection to Slow or Limit the Spread of Future Cascading Outages.
- All transmission owners will evaluate the zone 3 relay settings on all transmission lines operating at 230 kV and above for the purpose of verifying that each zone 3 relay is not set to trip on load under extreme emergency conditions. NERC will review any proposed exceptions to ensure they do not increase the risk of widening a cascading failure of the power system.
  - Each Region will evaluate the feasibility and benefits of installing under-voltage load shedding capability in load centers that could become unstable as a result of being deficient in reactive power following multiple-contingency events. The Regions are to promote the installation of under-voltage load shedding capabilities within critical areas that would help to prevent an uncontrolled cascade of the power system.
  - Evaluate “Planning Standard III—System Protection and Control” and propose revisions to adequately address the issue of slowing or limiting the propagation of a cascading failure. Evaluate the lessons from August 14 regarding relay protection design and application and offer additional recommendations for improvement.
9. Clarify Reliability Coordinator and Control Area Functions, Responsibilities, Capabilities and Authorities.
- More clearly define the characteristics and capabilities necessary to enable prompt recognition and effective response to system emergencies.
  - Ensure the accurate and timely sharing of outage data necessary to support real-time operating tools such as state estimators, real-time contingency analysis, and other system monitoring tools.
  - Establish the consistent application of effective communications protocols, particularly during emergencies.
  - The operating policies must be clarified to remove ambiguities concerning the responsibilities and actions appropriate to reliability coordinators and control areas.
10. Establish Guidelines for Real-Time Operating Tools.
- Evaluate the real-time operating tools necessary for reliable operation and reliability coordination, including backup capabilities and report both minimum acceptable capabilities for critical reliability functions and a guide of best practices.
11. Evaluate Lessons Learned During System Restoration.
- Evaluate the blackstart and system restoration performance following the outage of August 14 and develop recommendations for improvement.

- All Regions will reevaluate their procedures and plans to assure an effective blackstart and restoration capability within their Region.
12. Install Additional Time-Synchronized Recording Devices as Needed.
- Define regional criteria for the application of synchronized recording devices in power plants and substations and facilitate the installation of the devices to allow accurate recording of system disturbances and to facilitate benchmarking of simulation studies.
  - Facility owners will upgrade existing dynamic recorders to include GPS time synchronization and, as necessary, install additional dynamic recorders.
13. Reevaluate System Design, Planning and Operating Criteria.
- Evaluate operations planning and operating criteria and recommend revisions.
  - ECAR will reevaluate its planning and study procedures and practices to ensure they are in compliance with NERC standards, ECAR Document No. 1, and other relevant criteria; and that ECAR and its members' studies are being implemented as required.
  - Reevaluate the criteria, methods and practices used for system design, planning and analysis. This review shall include an evaluation of transmission facility ratings methods and practices, and the sharing of consistent ratings information.
14. Improve System Modeling Data and Data Exchange Practices.
- Establish and implement criteria and procedures for validating data used in power flow models and dynamic simulations by benchmarking model data with actual system performance. Validated modeling data shall be exchanged on an interregional basis to support reliable system planning and operation.

NERC's investigation will continue for some time. Although we believe that we understand what happened and why for most aspects of the outage, we are continuing to conduct detailed analysis in several areas, notably dynamic simulations of the transient or high speed phases of the cascade, and a final verification of the full scope of all violations of NERC and regional reliability standards that led to the outage.

To complete the technical investigation of what happened, regional modeling teams working with NERC have constructed electrical models to simulate the exact conditions of August 14 and are in the process of subjecting those models to the events that occurred during the time preceding the outage to understand better its causes. These simulations will examine the electrical stability of the grid—that is, how strongly the generators were synchronized to one another—and whether there was a voltage collapse of the transmission system. We will also focus on why operating procedures that should have detected problems that developed on the grid and kept them from spreading did not prevent the cascading outage across such a wide area. We expect to issue a detailed technical report on these issues later in the year.

I will conclude my testimony where I began, with an urgent request that Congress enact the reliability legislation this year. The set of recommendations the NERC board has adopted is an aggressive one. Right now we are able to accomplish much, because we have the strong support of the chief executives from all parts of the industry, as well as the attention of all participants. Everyone is now focused on reliability. But we are still very close to the events of August 14. With the passage of time, priorities will shift; people will move on; other issues will compete for attention. Having the reliability legislation in place will make sure that we can maintain the proper focus on reliability on an ongoing, sustainable basis.

NERC is fully committed to working with all sectors of the electricity industry, with the Federal Energy Regulatory Commission and other regulatory agencies, and with customers to ensure the reliability of the bulk electric system in North America. Our principal focus in the next several months will be to implement the recommendations the NERC board has now adopted. But the most important step for assuring the long-term reliability of the bulk electric system remains passage of legislation to make the rules mandatory and enforceable for all system owners, operators and users.

Thank you.

The CHAIRMAN. Thank you very much.  
Mr. Glotfelty, same rules, 5 minutes.

**STATEMENT OF JAMES W. GLOTFELTY, DIRECTOR, OFFICE OF  
ELECTRIC TRANSMISSION AND DISTRIBUTION, DEPART-  
MENT OF ENERGY**

Mr. GLOTFELTY. Yes, sir. Mr. Chairman, Senator Bingaman and other Senators and members of the committee, I appreciate the opportunity to participate in this hearing today.

As you know, the Power System Outage Task Force released its interim report in November 2003. The task force found that the August 14 blackout was caused by specific practice failures, rule violations, equipment and software failures and human decision, human decisions that are strikingly similar to other large blackouts that have impacted the United States.

After each of these major blackouts, since 1965, an expert team of investigators have probed the causes of the blackout, written detailed technical reports, and issued a list of recommendations to prevent or minimize the scope of future blackouts. The task force, our task force found the recommendations from prior reports have not been sufficiently implemented, sustained or enforced. And this is a dire consequence that we move forward with this.

Despite the problems with our reliability institutions and practices that we have found as a result of the latest blackout, there are a number of specific actions that we believe will make our system more reliable. These are actions that have been taken already.

NERC's letter to control areas and reliability coordinators in October 2003, directing short, near-term actions that must be taken to ensure reliability.

FERC's December 2003 order directing First Energy to implement a series of remedial actions. Initiatives undertaken by the Midwest ISO to ensure that their equipment is—their monitoring equipment is doing what is intended, as well as their joint operating agreement with PJM.

Finally, a heightened state of awareness among all of our transmission system operators could perhaps provide the most reliable action for the summer. Nobody wants to be the cause of the next blackout.

There are reliability issues that may still need to be addressed. These include the need to make compliance with the reliability standards mandatory. Obviously, the Congress has legislation pending before it and we urge them to pass this legislation, comprehensive legislation that includes mandatory reliability.

Additional issues. We need to establish a funding mechanism for NERC or a successor organization that is independent of the entities that they oversee. You need to clarify the prudent expenditures and investments to improve reliability in the transmission system are recoverable through transmission rights. The need to develop accountability metrics for NERC or a successor and its board. And finally, the need to ensure that the highest levels of corporate governance support and sign off on reliability plans and audits.

Many of these issues will be addressed in further detail when the task force issues its final report in March. What Mr. Gent went through were submitted to the task force as part of their public and open process. They were submitted to us through the United States and Canadian websites, they were posted on our websites when they were received so that everybody who wanted to have a

role in our process was able to see the recommendations that were submitted by NERC, and everybody else.

Many members of our task force have already expressed support for these recommendations that NERC has undertaken. Nevertheless, the task force may conclude that certain elements in NERC's package should be expanded or strengthened. And if so, it will suggest appropriate changes in our final report which we expect to be released in March.

In closing, Mr. Chairman, I want to emphasize that although there is a wide range of actions that need to be taken to ensure reliability, there is one action that is absolutely essential. Congress must enact comprehensive energy legislation with mandatory reliability provisions. That's a critical component.

I'd be happy to take questions. Thank you.

[The prepared statement of Mr. Glotfelty follows:]

PREPARED STATEMENT OF JAMES W. GLOTFELTY, DIRECTOR, OFFICE OF ELECTRIC TRANSMISSION AND DISTRIBUTION, DEPARTMENT OF ENERGY

Good morning, Mr. Chairman, Senator Bingaman, and other members of the Committee. My name is Jimmy Glotfelty. I am Director of the Office of Electric Transmission and Distribution (OETD), and currently serve as the U.S. Director of the Power System Outage Task Force. I appreciate the opportunity to participate in this hearing and to express the Department of Energy's (DOE) views on several matters related to the reliability of the bulk electric systems in North America.

Let me begin by noting that the Interim report of the Task Force released in November, 2003, found that the blackout on August 14, 2003 had several direct causes and contributing factors, including:

- Inadequate vegetation management
- Failure to ensure operation within secure limits
- Failure to identify emergency conditions and communicate that status to neighboring systems
- Inadequate operator training
- Inadequate regional-scale visibility over the bulk power system.

Although the initiation of the August 14, 2003, blackout was caused by the identified deficiencies in specific practices, equipment, and human decisions that coincided that afternoon, the Task Force also noted that many of the causes are strikingly similar to causes of earlier blackouts in the U.S.

The Task Force's Interim Report also noted that after each major blackout in North America since 1965, an expert team of investigators had probed the causes of the blackout, has written a detailed technical report, and issued a list of recommendations to prevent or minimize the scope of future blackouts. The report clearly found that recommendations from prior reports have not been sufficiently implemented, sustained, or enforced.

Despite the problems in our reliability institutions and practices that have been identified to date in the Task Force's investigation of the August 14 blackout—with invaluable support and cooperation from NERC and other industry experts across the U.S. and Canada—I believe that our electric system is being operated more conservatively today than it was on, say, August 13, and this could mean greater reliability. This is due to a combination of actions and factors, including:

- The letter from NERC's Board of Trustees on October 10, 2003, directing the heads of all control area and reliability coordinator organizations to take a series of near-term actions to protect reliability.
- The Federal Energy Regulatory Commission's (FERC) order of December 24, 2003 to FirstEnergy, directing the company to implement a series of remedial actions by June 30, 2004.
- Initiatives undertaken by the Midwest Independent System Operator (MISO) to address the deficiencies in its tools and procedures identified in the Task Force's Interim Report as well as their new joint operating agreement with PJM.
- A general heightening of awareness since August 14, particularly due to the issuance of the Interim Report, of the importance of reliability. One of the challenges we face now, and which the Task Force will address in its recommendations, is how to sustain that awareness for the long term.

In addition, the Department of Energy strongly supports the more recent action by NERC's Board on February 10 when it issued fourteen very clear and forceful directives to NERC's regional councils, committees, and members concerning near-term and long-term actions to be taken to correct problems identified in the course of the Task Force's investigation. I am pleased to add that FERC, Regional Transmission Organization and Independent System Operator presidents, and appropriate authorities in Canada have also indicated their strong support for these actions.

Important though NERC's directives are, it is also important to note that they cover only part of the spectrum of issues relevant to maintaining reliability for the long term. That is, they cover the things that NERC is able to do now, on its own, given its current legal status as a voluntary organization funded by its members. There is another set of reliability concerns that have been raised that would need to be addressed by government actors, including the Congress, federal agencies such as FERC, DOE, state legislatures and regulatory agencies, and appropriate authorities in Canada. These include:

- The need to make compliance with reliability standards mandatory and enforceable by enacting comprehensive energy legislation.
- The need to establish a mechanism for funding NERC or a future reliability organization and the regional reliability councils that is independent of the entities they oversee.
- The need to clarify that prudent expenditures and investments to maintain or improve reliability will be recoverable through transmission rates.
- The need to require all entities operating as part of the bulk power system to be members of the regional reliability council (or councils) for the regions in which they operate.
- The need to develop accountability metrics for NERC and its Board. And finally,
- The need to ensure that the highest levels of corporate governance support and sign off on reliability plans and audits.

Many of these issues will be addressed in further detail when the Task Force issues its Final Report in March.

Mr. Chairman, as you know, the Task Force sponsored a series of public meetings at several U.S. and Canadian sites to hear the suggestions of the public, industry, and a wide variety of other organizations concerning what should be done to prevent future blackouts and minimize the scope of any that nonetheless occur.

Interested parties have also submitted a large body of written comments and material to the Task Force, all of which is publicly available at U.S. and Canadian websites ([www.electricity.doe.gov](http://www.electricity.doe.gov)).

NERC's initiatives of February 10 were submitted to us and made publicly available in both draft and final form as part of this process. The Task Force will draw on these inputs and the findings of its investigation in preparing its recommendations for its Final Report. Members of the Task Force, such as FERC Chairman Pat Wood, have already expressed strong support for NERC's actions of February 10. Nevertheless, the Task Force may conclude that certain elements in NERC's package should be expanded, and if so it will suggest appropriate changes.

In closing, Mr. Chairman, I want to emphasize that although there is a wide range of actions that many parties need to take to maintain reliability, there is one action that is absolutely essential. The Congress must enact comprehensive energy legislation with mandatory reliability provisions as a critical component. If that were done, many of the other needed actions could be accomplished readily in the course of implementing the legislation. Without the solid legal foundation legislation would provide, our institutional infrastructure for maintaining reliability will continue to have significant weaknesses.

Thank you very much. I will be happy to answer your questions.

The CHAIRMAN. Thank you. Thank you very much. Louise McCarren, CEO of the Western Energy Coordinating Council, WECC, covers the Western Interconnect, Interconnection, all States west of the Rockies from Montana to New Mexico, is that correct?

Ms. MCCARREN. Yes. Thank you.

The CHAIRMAN. Five minutes and we put your statement in the record.

**STATEMENT OF LOUISE McCARREN, CEO,  
WESTERN ELECTRICITY COORDINATING COUNCIL**

Ms. MCCARREN. Thank you, sir. Thank you Chairman and Senators. I appreciate very much the opportunity to speak to you.

I have four points I'd like to make. The first is that the WECC and all of its members wholeheartedly support the reliability legislation. And the three key components for us are the delegation of authority, the deference clause and the regional advisory bodies, all of which we support. The key underpinning, of course, is the need for mandatory reliability criteria, and the ability to enforce such criteria.

Second point I want to make is we support NERC's recommendations as outlined by Mr. Gent and are working actively with NERC, particularly on supplying help for the readiness audits.

The third and major point I want to make this morning is that as a result of two very serious outages in the Western Interconnect in 1996, the WECC and its members implemented a voluntary reliability management system which is a contractual relationship—relation among the transmission owners and generators. And it has in it adherence to a number of criteria which are contained in an appendix to my testimony, and a series of penalties, including potential financial penalties for noncompliance to those criteria.

This has been an evolving process in the West, and it works well. It certainly can be improved, but we have it in place. And the key point is right now there is a contractual voluntary relationship.

And finally, my last point, we believe strongly that the NERC and the Regional Reliability Council should be the primary organization to establish and implement reliability standards with a strong FERC back stop for compliance. Thank you very much.

[The prepared statement of Ms. McCarren follows:]

PREPARED STATEMENT OF LOUISE MCCARREN, CEO, WESTERN ELECTRICITY  
COORDINATING COUNCIL

Chairman Domenici, Senator Bingaman and Members of the Committee. Thank you very much for this opportunity to testify before you today on the very important issues of transmission grid reliability, the role of reliability standards and ensuring compliance with reliability standards. I welcome the opportunity to explain how reliability is addressed in the West, and to offer some perspectives on what Congress needs to do to enhance grid reliability on a national basis.

The Western Electricity Coordinating Council, or WECC, is the largest and most diverse of the ten regional electric reliability council members of the North American Electric Reliability Council, covering the entire Western Interconnection (see Attachment 1).<sup>\*</sup> WECC is a voluntary organization whose mission is to promote a reliable electric power system in the Western Interconnection, support efficient competitive power markets, assure open and non-discriminatory transmission access among members, provide a forum for resolving transmission access disputes, and provide an environment for coordinating the operating and planning activities of its members as set forth in the WECC Bylaws.<sup>1</sup>

The WECC region encompasses a vast area of nearly 1.8 million square miles, extending from Canada to Mexico. It includes the Canadian Provinces of Alberta and British Columbia, the northern portion of Baja California, Mexico, and all or portions of the 14 western states in between. Due to the vastness and diverse charac-

<sup>\*</sup> Attachments 1 and 2 have been retained in committee files.

<sup>1</sup> The WECC was formed on April 18, 2002, by the merger of the Western Systems Coordinating Council ("WSCC"), the Southwest Regional Transmission Association, and the Western Regional Transmission Association. The WSCC was formed with the signing of the WSCC Agreement on August 14, 1967 by 40 electric power systems. Those "charter members" represented the electric power systems engaged in bulk power generation and/or transmission serving all or part of the 14 western states and British Columbia, Canada.

teristics of the region, WECC's members face unique challenges in coordinating the day-to-day interconnected system operation and the long-range planning needed to provide reliable and affordable electric service to more than 71 million people in WECC's service territory.

Today, over 35 years after the founding of our predecessor, the Western Systems Coordinating Council or WSCC, the WECC continues to be responsible for coordinating and promoting electric system reliability throughout the Western Interconnection, as well as providing the forum for its members to enhance communication, coordination, and cooperation—all vital ingredients in planning and operating a reliable interconnected electric system. A central focus of this effort in recent years has been the development and implementation of the Reliability Management System, a contract-based system to protect the reliability of the Western grid.

#### WECC'S RELIABILITY MANAGEMENT SYSTEM

As the electric industry moved toward competitive markets, and following two widespread outages in 1996 in the Western Interconnection, the WSCC recognized the need to place a greater emphasis on operating the transmission system in accordance with established reliability criteria. Recognizing that it might take a number of years to pass federal reliability legislation, the WSCC Board of Trustees established a policy group and three task forces to develop, through an open process, the Reliability Management System (RMS).

Under the RMS, 23 WECC member control areas<sup>2</sup> and seven other transmission operators<sup>3</sup> have agreed, through contracts with the WECC, to comply with WECC reliability criteria. These organizations are defined as Participating Transmission Operators in the RMS Agreements. The contractual obligations to comply with WECC RMS Reliability Criteria also extend to 16 contracts entered into between Participating Transmission Operators and interconnected generators. In addition, two control areas have incorporated the RMS Agreements into their electric rate tariffs, thereby obligating another 117 generator owners to comply with RMS Reliability Criteria.

Under the RMS, non-complying entities are subject to sanctions (ranging from letters indicating noncompliance to monetary sanctions). Initial determinations of non-compliance are made by the WECC staff. All determinations by the WECC staff can be appealed by the sanctioned party to a "Reliability Compliance Committee" with representation of multiple market participants. Challenges to sanction determinations by the Reliability Compliance Committee can be made through alternative dispute resolution procedures.

Contracts between the WECC and all Participating Transmission Operators not subject to Federal Energy Regulatory Commission (FERC or Commission) jurisdiction, such as public power systems, are based on the same contract used by FERC-jurisdictional Participants, with necessary modifications to the provisions regarding filings with the Commission. To ensure that the requirements of the RMS remain uniform throughout the Western Interconnection, the transmission operators not subject to FERC jurisdiction have agreed to amend their contracts to reflect all changes to the contracts required by the FERC for transmission operators subject to FERC jurisdiction. In addition, the contracts with Canadian entities are subject to review by provincial authorities in Canada.

In establishing the RMS, the RMS policy group and task forces reviewed all NERC and WECC (WSCC) reliability criteria and identified specific criteria that are critical for reliability management, and for which compliance could be measured. The addition of criteria to the RMS contracts in a phased approach has, in each phase, been preceded by an evaluation period during which data were collected, but no sanctions were enforced. The evaluation period permitted WECC members to provide comments, recommend refinements, and determine if the criteria were suitable for a mandatory compliance program. From the evaluation process, criteria were incorporated in three phases into the RMS Reliability Criteria. The RMS criteria are listed in Attachment 2.

WECC is carefully reviewing the findings of the August 14, 2003, blackout to learn from the experience and improve our operation even though the outage did not occur in our area. We are treating the findings as if the outage did occur in the

<sup>2</sup>Control area as used here means an electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other control areas and contributing to frequency regulation of the Western Interconnection.

<sup>3</sup>Other transmission operators here are organizations that own and operate major transmission facilities in the Western Interconnection that are not control areas.

Western Interconnection. The RMS Reliability Criteria can be refined if the review recommends any revisions.

During the RMS development process, the confidential treatment of RMS compliance data by the WECC staff emerged as a critical issue. Section 5.2(a) of the RMS Criteria Agreement requires that “the WECC Staff (1) shall treat as confidential all data and information submitted to the WECC Staff by a Participant under this Reliability Agreement, (2) shall not, without the providing Participant’s prior written consent, disclose to any third party confidential data or information provided by a Participant under this Reliability Agreement, and (3) shall make good faith efforts to protect each Participant’s confidential data and information from inadvertent disclosure.” However, Section II of Annex A to the RMS Criteria Agreement requires that notices of noncompliance be sent to: (1) corporate officers of Participants determined to be in noncompliance; (2) state or provincial regulatory agencies with jurisdiction over such Participants; and, (3) in the case of U.S. entities, FERC and the Department of Energy, if the government entities request this information.

On April 14, 1999, the FERC granted the WSCC’s request for a declaratory order asserting jurisdiction over the RMS. Western Systems Coordinating Council, 87 FERC ¶61,060 (1999).<sup>4</sup> The Commission explained that:

The RMS . . . requires participants to adhere to reliability criteria and contains sanctions for failure to comply with those criteria. As such, we agree at this time with WSCC that the RMS significantly ‘affects or pertains to’ rates and charges by public utilities subject to this Commission’s regulation. Accordingly, on these specific facts, our ‘rule of reason’ will allow us to accept for filing the RMS and RMS contracts with Commission-jurisdictional public utilities.

As such, all of the RMS agreements with FERC-jurisdictional entities, and all amendments thereto, have been filed with, and accepted by, the Commission under Section 205 of the Federal Power Act.

As explained above, the RMS is being implemented in a phased approach, with new criteria added only after a period of evaluation during which the effectiveness and enforceability of the criteria are assessed by the WECC and its members. The third phase was accepted by the FERC by letter order issued December 17, 2003, in Docket No. ER04-27-000 and went into effect on January 1, 2004. This process ensures that the criteria included in the RMS set clear, objective standards and that compliance with such criteria is readily measurable.

Twenty-three of thirty-three WECC control areas are voluntary RMS Participants, accounting for approximately 88 percent of the load and 81 percent of the generation in the WECC region. The WECC staff continues to work with control areas and others who are not RMS Participants to encourage their participation.<sup>5</sup>

The WECC strongly supports the passage of federal legislation authorizing mandatory reliability standards, such as Section 1211 of S. 2095. As discussed in greater detail below, this legislation authorizes delegation from the national Electric Reliability Organization to regional entities, such as the WECC, for the purpose of proposing and enforcing reliability standards. Indeed, in the case of a regional entity organized on an Interconnection-wide basis, like the WECC, the legislation presumes that such delegation is appropriate. These delegation and deference provisions are important to protect the success of the RMS program, and prevent any disruption of it. While the WECC RMS program takes careful account of current NERC standards, and is often based on them, the RMS program has been carefully tailored to address the specific needs and concerns of system users in the Western Interconnection. Moreover, development of the RMS took several years, and the RMS has undergone significant refinement in the years since it first went into effect.

With respect to compliance with reliability standards, WECC believes the accountability through RMS data reporting has been a constant reinforcement to member organizations to comply with operating reliability requirements. Though financial sanctions are not the only means of enforcement, they have worked quite well for the Western Interconnection.

The RMS also has a significant advantage in that it includes two Canadian Provinces and a Northern Mexican State that are not subject to FERC jurisdiction (in addition to numerous non-jurisdictional US entities). This provides great value to the Western Interconnection for reliability that is very important in the absence of

<sup>4</sup> In addition, the Department of Justice has provided a Business Review Letter regarding the RMS covering antitrust concerns.

<sup>5</sup> Ten WECC control areas are not RMS signatories. They are Avista Corp., Comision Federal de Electricidad, Portland General Electric Company, PUD No. 1 of Chelan County, PUD No. 1 of Douglas County, PUD No. 2 of Grant County, Puget Sound Energy, Seattle City Light, Sacramento Municipal Utility District, and Tacoma Power.

the passage of legislation, and with respect to the Canadian Provinces, important even with the passage of legislation.

The WECC supports mandatory reliability standards and reasonable enforcement of such standards. However, it is essential that any such standards be designed and developed to maximize system reliability. That process has been one of the WECC's core missions, through the RMS, during the past few years. The RMS criteria, specifically tailored for the unique characteristics of the Western Interconnection, are carefully designed to enhance and maintain the reliability of the entire Western region.

#### NEED FOR RELIABILITY LEGISLATION

As mentioned above, the WECC fully supports passage of the proposed reliability legislation. The WECC and its predecessor, WSCC, have participated over the past several years in the development of this legislation to ensure that it properly reflects the reliability challenges and accomplishments of the West. The following provisions of the legislation are particularly important to the WECC:

1. *Delegated authority to a regional entity under Section 215(e)(4)*. This section requires the Commission to issue regulations authorizing the Electric Reliability Organization ("ERO") to enter into an agreement to delegate to a conforming regional entity authority for proposing and enforcing reliability standards. This language would enable delegation to a regional entity with an established reliability system such as the WECC.

2. *"Deference clause" in Section 215(d)(3)*. Under this provision, the ERO must presume, subject to rebuttal, that a proposal from a regional entity that is organized on an Interconnection-wide basis encompassing its entire Interconnection is just, reasonable, and not unduly discriminatory or preferential and in the public interest.

3. *The creation of Regional Advisory Bodies under Section 215(j)*. This provision will ensure an appropriate role for states in the reliability assurance process.

The WECC strongly supports the pending legislation and believes that it strikes the appropriate balance between the development of mandatory and enforceable reliability requirements throughout the nation and the need for regional flexibility and deference. That deference is appropriate where a solution that makes sense in one Interconnection, and does not adversely affect systems in a neighboring Interconnection is, for some reason, not appropriate as a uniform continent-wide standard.

Though the goal of common continent-wide standards is laudable, the Western Interconnection is distinct from the Eastern Interconnection and Texas. As such, the pending legislation correctly recognizes that the Western Interconnection must have an important role in the development of reliability standards for the West.

#### CONCLUSION

Thank you, Mr. Chairman, and Senators for the opportunity to present to you the WECC's perspectives on the important subject of ensuring the reliability of our transmission system. I hope that this perspective has been useful to you, and I welcome your questions.

The CHAIRMAN. Thank you very much, ma'am. Mr. Phil Harris, President and CEO of PJM Interconnection. And PJM covers Pennsylvania, New Jersey and Maryland, is that correct?

Mr. HARRIS. No, Mr. Chairman. It's Pennsylvania, New Jersey, Maryland, Delaware, Washington, D.C., Virginia, and we are merging into the States of Ohio, Kentucky, West Virginia, Indiana, and Illinois.

The CHAIRMAN. I apologize.

Mr. HARRIS. Indeed, Mr. Chairman, with the expansion of PJM, it's interesting that PJM will be larger than the entire Western Interconnection combined.

The CHAIRMAN. Proceed.

**STATEMENT OF PHILLIP G. HARRIS, PRESIDENT AND CEO,  
PJM INTERCONNECTION, L.L.C.**

Mr. HARRIS. All right. It is a pleasure to be here, Mr. Chairman, particularly thinking back to my New Mexico roots. I operated a power system for a long time in New Mexico, I also operated a power system for nearly a decade in Louisiana.

In the course of these events, I have worked for utilities and cooperatives. So in the past 10 years I have been the president and CEO of PJM in the Northeast. So I think I have a fairly well understanding of the electrical dynamic across this nation.

I think the biggest problem we have right now and I appreciate the chairman and the Congress for jumping on this is the fact that there is a lack of confidence. We need to get the confidence back in our industry. We need to get the trust back.

If you look at the electric industry as we sit today and as it's evolved over the past 100 years, we have 4,000 different entities involved with the generation, transmission and distribution of power. And this is regulated and governed by 50 different States.

You heard Mr. Gent comment earlier, there is over 155 control areas all trying to control this single synchronous motor that is running. And that's all electricity is, it's really a single motor. Some of those entities are regulated by the Federal Energy Regulatory Commission, some aren't regulated at all. Some report to the President of the United States. There are many different structures involved, and we found that that particular gaggle of construct is not sufficient to meet the needs of the 21st century.

I'm very pleased, Mr. Chairman, when you brought the issues of technology, superconductors and what technology has done. We have been operating competitive power markets for the past 6 years and technology has been the key to be able to operate these things in a very, very large size and to do it successfully.

We have added over 11,000 megawatts in new generation. We currently have over 3,600 megawatts in generation under construction to service areas. We have 10,000 megawatts that are also in the planning queue to be built and constructed. We have had over \$700 million of transmission in this area with 65 percent of it participant funded. So where do we stand and where do we think—

The CHAIRMAN. What kind of funding?

Mr. HARRIS. Participant funding, where the generator is paid for.

The CHAIRMAN. All those growth numbers you are using, are those in any way related to acquiring areas, or are they all natural growth?

Mr. HARRIS. It's growth from the competitive markets and the structure we have to enable wholesale competitive markets to deliver increased reliability for the customer.

I think there are three essential elements that need to take place in the legislation, and they are all combined and I think they are all in there.

First of all, we do need mandatory national standards. But these standards need to be developed and approved and see due process because of the different kinds of entities. Some areas of the country have markets, some do not. You need a healthy, derived process to determine what the standards should be and shouldn't be.

Second of all, just as NERC itself is auditing the control areas, the NERC organization needs to be auditable. No organization can be beyond public oversight. It's absolutely crucial that FERC have the authority to provide public oversight of this institution, do the auditing and the controls necessary and also to allow appellate processes to develop.

With the country split, there is about 60 percent of each interconnection now is covered by RTOs, about 50 percent nationally. Some areas have moved to wholesale markets, some haven't, so there is going to be some disconnects and disputes, and only FERC can resolve the issues between commercial products and reliability standards because they are intertwined.

And thirdly, there needs to be FERC oversight over wholesale transmission for all entities, and I believe all of that is in the legislation. With these three elements, I think we can move forward to a much more healthy and robust industry and I certainly encourage the passage of those.

One final comment I would like to bring back and again the rule of technology in improving reliability. What large RTOs do is it takes these 4,000 entities, and were able to bring them together in ways to optimize the real time balance. We have demand side programs now that have tremendous value because we have been able to optimize that and use that technology in dispatch.

We are using artificial intelligence. We are using neurologic networks and some of these technologies to handle tens of thousands of buses. We are actually looking at 3,000 different contingencies every 30 seconds to make sure the system will always be stable and reliable.

You can get the economies of scale, you can get the reliability, you can get the efficiencies, you can increase the capacity, you can have the planning and it will work and be a healthy industry as we move the Nation forward. Thank you, Mr. Chairman.

[The prepared statement of Mr. Harris follows:]

PREPARED STATEMENT OF PHILLIP G. HARRIS, PRESIDENT AND CEO,  
PJM INTERCONNECTION, L.L.C.

Mr. Chairman and Members of the Committee:

I am Phillip Harris, President & CEO of PJM Interconnection, L.L.C. PJM is the Regional Transmission Organization dedicated to the enhancement of reliability and the operation of competitive wholesale electricity markets in a seven-state region spanning from Ohio to Delaware and from Virginia to New Jersey. In fact, the electricity serving this very building here in the District of Columbia flows reliably and at a reasonable price, in part, as a result of the competitive market structure operated by PJM.

The events of August 14, 2003 represent as much a crisis in confidence in this industry as it does a failure of the electric power grid. As one who has worked in this industry my whole life operating power plants, as well as transmission and distribution systems, my message is simple: we must redouble our efforts to restore the public's confidence. To do so, we need to remain focused like a laser on the end goal and identify, with specificity, what is working and what needs repair in this fast moving environment. We can only do this by avoiding sound bites when specifics are needed or painting with a broad brush when a felt tip pen is needed. I will try to provide some of those needed specifics today.

The "bottom line" is that there is no silver bullet, be it legislation or trimming trees that represents "the" single answer. Rather, we are in the middle of a long and difficult transition. We are dealing with a speed of light product that does not respect state or even international borders. Yet, this industry was built, financed and operated for over 80 years as a gaggle of over 4000 different entities providing varying aspects of the service of generation and delivery of electricity.

We need to develop comprehensive solutions to meet the public's 21st century demand for this product. The events of August 14 show what happens when we try to harness this speed of light product using a "mix and match" of 20th century balkanized command and control solutions to meet 21st century needs.

Although my testimony will address the August 14 event, I want to lead with what I think is the far more pressing issue: How do we address the critical crossroads we find ourselves in today? How does Congress and the Federal Energy Regulatory Commission, as our nation's policymakers, move this industry forward through clear and coherent policies and institutions? How do we avoid the pitfalls of unclear or internally contradictory policies slowing industry growth and discouraging investment? I am here to outline the specific answers that I believe are needed given where we are and where we need to be.

*Answer #1—Instituting Transparent and Independent Regional Planning*

Much of the mid-Atlantic region's ability in real time to withstand the disturbance of August 14 was the result, not of human intervention, but of hardware working as it should hardware that was designed to protect each of our systems from outside faults, voltage drops and other system disturbances that threaten system reliability. Although the hardware generally worked as it should, the hardware didn't just come into being magically. Rather, the hardware was planned and sited as a result of a transparent planning process undertaken by PJM with the involvement of all stakeholders, from state commissions to landowners to large utility companies. I underscore the word "transparency". In the past, each utility planned its system essentially as an island. Each utility designed and operated its systems to meet that particular system's needs. Although interconnections were acknowledged, the concept that one can find a better alternative by taking an action on an adjoining system was the exception rather than the norm. An independent entity, with a "big picture" look at the entire grid, can, through such a transparent process, ensure that the appropriate hardware is in place and that reliability is maintained proactively and at prudent cost to the consumer.

Let me be more specific. The fully and provisionally approved ISOs and RTOs in the eastern interconnection along with the Tennessee Valley Authority, are currently committed to developing an overall transparent regional plan. The development of that extensive a comprehensive plan, which, in this case will cover nearly 60% of the Eastern Interconnection and over 100 million Americans, is unprecedented for this industry. As a result of transparency, independence and sheer size, these entities are able to come together to develop a regional plan that will address comprehensively the needs of this very large portion of America's interconnected grid. Only independent entities such as RTO's can undertake these solutions in a manner which will not be seen by the marketplace as favoring one provider over another or sacrificing one entity's "native load" at the expense of another's "native load."

*Answer #2—Ensuring Appropriate Reliability Jurisdiction With Regulatory Oversight*

We agree with the proponents of the energy legislation that one must ensure that all market participants are subject to the same set of reliability rules. This includes those entities that are not, today, subject to FERC jurisdiction. The Senate Energy bill would do that and PJM had always been and remains a proponent of this vital part of the legislative reliability proposal. Notably, in areas of the country covered by RTOs, this is not as significant an issue—for example, in PJM our existing tariff already reaches non-jurisdictional entities to ensure compliance with NERC and regional council reliability standards.

Today, nearly 50% of peak load and installed generation, covering all or parts of 29 states, is managed by fully approved or provisionally approved RTOs and ISOs. So at least in RTO areas, there exist structural solutions that address the need for reliability authority over all entities not just traditional-FERC regulated companies. That being said, a legislative solution would enshrine such a rule throughout the nation.

On a larger plain, we need to get the role of the regulator right. It is critical that FERC, already the regulator of the wholesale market and the overseer of wholesale prices, also has a strong oversight role in the adoption and enforcement of reliability standards. FERC's oversight over reliability must not be a passive one—simply rubber stamping proposals that come before it. Rather, reliability and market issues are so inextricably intertwined that the regulator must have the tools and authority to fully and swiftly address the intertwined relationship of markets and reliability. This can best be accomplished through strong regulatory oversight over both sides of the coin—the market and reliability.

*Answer #3—Need for Regional Coordination*

Some have suggested that RTOs were one of the causes of the problems of August 14. I would suggest just the opposite. Fully-functioning RTOs are the present and future solution that solve the balkanized network problems which arose on August 14. In the PJM region, our regional oversight has led to a marked improvement in reliability. For example, since inception of our markets, we have seen a dramatic increase in the efficiency of generating plants. Since 1998, the forced outage rate (defined as the number and duration of episodes of generating units not operating as planned) has declined more than 20%.

In its February 10, 2004 report on the August 14 outage, NERC requests one specific action of PJM: namely, reevaluation and improvement of communication protocols between neighboring reliability coordinators and neighboring control areas. It is worth noting that we were actually working on improving these protocols even before the August 14 outage occurred let alone before the NERC report. As of August 14, 2003, we had reached agreement with the MISO and had submitted for stakeholder review a proposed Joint Operating Agreement that addressed these communication protocols and more as they affected our two systems. We have subsequently further enhanced this protocol in response to the recommendations of the DOE/Canadian task force and in our discussions with NERC.

This operating protocol moves reliability in the Midwest to the next level by providing for disciplined and detailed coordination between our two systems in a manner that is unprecedented today between neighboring control areas. The Joint Operating Agreement between MISO and PJM not only ensures real time data communication and modeling of each other's systems, but in addition details specific protocols as to what each system is to do proactively to address system conditions on the neighboring system. Among other things, the two RTOs will honor each other's key flowgates. PJM will operate its system to respect and relieve congestion on the Midwest ISO system with a similar level of support from the Midwest ISO back to PJM once the MISO's markets are functional. This agreement remains a flexible document designed to address additional recommendations coming out of NERC or the DOE/Canadian reports. We believe that this agreement represents a new level of regional coordination that can be utilized as a model throughout the nation. I want to thank the MISO and its staff for their excellent working relationship with us and look forward to prompt NERC and FERC approval of this important protocol. A brief description of the Joint Operating agreement is attached.\*

Despite not having the agreement actually in place, on August 14 PJM proactively went beyond a control area operator's existing obligations in order to communicate both with First Energy and the MISO to let them know of system disturbances we were seeing on the First Energy system. In short, we went beyond the existing NERC standards by alerting neighboring systems of problems. Although better communication is always appropriate (and a critical component of the MISO/PJM Joint Operating Agreement), let us not use this to mask the underlying problem. At the root cause, the First Energy system did not follow established reliability procedures to proactively address deteriorating system conditions such as occurred on August 14 and did not have the necessary situational awareness of what was happening on their system that day. Had the Midwest ISO have in place the tools that it is now working with us to put in place, the root causes of the August 14 outage might have been avoided. I am attaching to this testimony the ISO/RTO Council's as well as PJM's response to NERC's outage report which details our concerns. I am also attaching an article from two academicians outlining how the PJM market rules, had they been in effect in the Midwest on August 14, would address congestion on the transmission system

*Answer #4—Support FERC's Efforts to Place AEP Into PJM*

I discussed above the need for large regional transmission organizations with the functional control and oversight over very large areas so they can "see the big picture" and utilize tools to spot and correct reliability issues before they become problems. MISO, with its control of 122,000 MW of generation, and PJM, with its control of 76,000 MW of generation, can perform those critical tasks and end the balkanized system we have in the Midwest currently. That being said, we have an immediate problem on our hands, one which can only be solved by prompt and comprehensive regulatory action. Specifically, the American Electric Power system, representing over 42,000 MW of generation remains outside of any Regional Transmission Organization. Although PJM serves as the reliability coordinator for AEP and took steps on August 14, working with AEP, to protect its customers and the surrounding re-

\*All attachments have been retained in committee files.

gion, without the market-based operational control that PJM brings, the Midwest is faced with a giant "hole in the donut" when it comes to the voluntary coordination of utilities in the region.

AEP's voluntary decision to join PJM is forestalled by certain regulatory action and inaction within certain states. We face an unfortunate but perhaps inevitable problem where the states of Illinois, Indiana, Michigan, Pennsylvania, New Jersey and the District of Columbia have all weighed in urging FERC to integrate AEP into PJM as rapidly as possible. By contrast, the states of Virginia and Kentucky today are holding up such integration. Absent a timely resolution of this matter by FERC, the Midwest remains exposed. Although today we have a well-run reliable AEP system that PJM is overseeing as AEP's Reliability Coordinator, there are dollars and benefits that are delayed while this state vs. state gridlock continues. We note that FERC Chairman Wood indicated in a recent letter to Georgia Governor Sonny Perdue that this matter involves "a dispute among states involving transmission and wholesale power in interstate commerce" and that over \$61 to \$80 million in annual net benefits for retail service providers in AEP's territory and approximately \$932 million in benefits for retail service providers in PJM, AEP and Dominion are at stake.

This Congress has given the power to the FERC to resolve such impediments when they interfere with the voluntary coordination by utilities such as AEP seeking to join PJM. We urge this Congress to allow the regulatory process to move forward, to recognize that this is a unique fact-specific case where one state's actions are interfering with another state's action and allow FERC to work through this process. Although some have used sound bites to characterize this matter, this is not an issue of federal preemption of the states but, as FERC Chairman Wood indicated to Governor Perdue, a dispute that the FERC "seeks to oversee in a way that brings about the best result for customers." Resolving divisions among states on matters of interstate commerce is nothing new. The need for a federal authority to resolve such disputes was one of the bedrock principles that caused our founding fathers to abandon the loosely knit Articles of Confederation and adopt the interstate commerce provisions of the U.S. Constitution.

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I began this discussion by noting that we need to reaffirm all that has worked well and focus, like a laser, on those aspects of our industry that need improvement. As I indicated above, through regional planning, strong regulatory oversight over reliability, enhancement of fully functioning regional transmission organizations and regulatory action to solve the lack of AEP in an RTO, we can begin to build the structural base that will begin to restore consumer confidence in this vital industry. Mr. Chairman and Committee members, we at PJM stand ready to work with you and all stakeholders to ensure that our electric system meets the 21st century needs of this great country.

The CHAIRMAN. Thank you very much. James P. Torgerson, president and CEO of the Midwest Independent Transmission System. MISO covers 15 central States and one Canadian province, is that correct?

Mr. TORGERSON. That is correct, sir.

The CHAIRMAN. Please proceed.

**STATEMENT OF JAMES P. TORGERSON, PRESIDENT AND CEO, MIDWEST INDEPENDENT TRANSMISSION SYSTEM OPERATOR, INC.**

Mr. TORGERSON. Good morning, Mr. Chairman and members of the committee. Thank you for the opportunity to appear before this committee to address recommendations made by NERC as a result of its investigation of the August 14 blackout.

At the outset, I would like to say that the Midwest ISO has fully cooperated with the various investigations into the events of the August 14. We have found that working with the investigators of the international task force and NERC has been a valuable experience.

Meeting the recommendations allows us to confidently operate a grid that has been thoroughly reviewed for compliance with best reliability practices. Mr. Chairman, I'm pleased to inform the committee that the Midwest ISO will meet or exceed the NERC recommendations that is the subject of today's hearings.

The Midwest ISO was formed in 1998. It is the first entity found by FERC to be an RTO. The Midwest ISO region covers portions of 15 States and the Canadian province of Manitoba. Of relevance to your inquiry here, we act as reliability coordinator for two sets of companies, one who are members, and a second set in the mid-continent area power pool region that have not transferred control of their transmission systems to the Midwest ISO.

As reliability coordinator, the Midwest ISO monitors, plans, conducts analyses regarding the high voltage grid and communicates with the control areas in our region who have primary control capabilities to open and close transmission circuits and to redispatch generation.

Three of the more than 30 companies within our reliability coordinator territory suffered outages in the blackout of August 14. Mr. Chairman, your letter of invitation to this hearing asked us to respond to the recommendations contained in the NERC's February 10 report. The recommendations which most directly apply to the Midwest ISO are found in attachment A, section B to the recommendation 1 of the NERC report.

I'd like to briefly summarize the Midwest ISO's responses to NERC's recommendations. The more detailed response is contained in my full testimony previously submitted to the committee.

As to NERC recommendation number 1 that the Midwest ISO improve its reliability tools, we have put our State estimator into production and as of December 31, 2003, it has served as our main reliability tool. This comprehensive tool allows us to gather real-time information on the status of our system and our neighboring systems. The State estimators run every 90 seconds and solves in less than 30 seconds using over 88,000 data points.

We also have expanded our capabilities to run contingencies on our systems so that we have already modelled impacts on the grid if certain problems arise.

This analysis tool is run after every third State estimator solution and it's completed in less than 10-minute standard of NERC, while evaluating over 5,000 contingencies. We have also implemented software updates that allow us to sort the data we receive with more emphasis on the information with the greatest potential for negative impact on the grid. Finally, in a case of a problem within any of our systems, we have developed a redundant backup.

As to NERC recommendation 2, that we improve our tool that's designed to allow visualization of the grid status by our employees, we have more than doubled our video display areas, we have increased our ability to see the grid on a wider basis and we have increased our ability to see in greater detail any identified problems.

As to NERC recommendation number 3, that we improve operator training criteria, we have participated in emergency drills and are instituting a series of additional drills and training that will be

in place by June 30. In addition, we will train individual operators on a simulator.

As to NERC recommendation number 4, that we improve our communications, we have worked with our members to clearly identify communication protocols in times of a system emergency. We have also increased communication of detailed information with non-Midwest ISO members, and now we are also fully utilizing NERC systems.

As to NERC recommendation number 5, that we verify reliability authority, we have developed a reliability charter with our members to specifically delineate roles and responsibilities. We have developed a detailed joint operating with PJM.

And Mr. Chairman, we also support the remaining NERC recommendations contained in the February 10 report that are not specifically directed to the Midwest ISO.

If I may now turn to energy legislation pending before the Congress, I think that we all agree that reliability provisions in H.R. 6 and S. 2095 will enhance system reliability. But I'd like to take this opportunity to suggest that there are other issues addressed in the electricity title of the energy bill that would benefit grid reliability.

By acting on issues that bring certainty to investments and grid upgrades, Congress can help get needed infrastructure built. We believe that the infusion of capital needed to enhance the electricity infrastructure will not occur while legislation that may change the assumption of such investments is a possibility. Anything that can be done to remove that uncertainty would help facilitate investment in the grid and I would be happy to answer any questions.

[The prepared statement of Mr. Torgerson follows:]

PREPARED STATEMENT OF JAMES P. TORGERSON, PRESIDENT AND CEO, MIDWEST  
INDEPENDENT TRANSMISSION SYSTEM OPERATOR, INC.

Good morning, Mr. Chairman and members of the Committee. My name is James P. Torgerson. I am the President and Chief Executive Officer of the Midwest Independent Transmission System Operator, Inc. ("Midwest ISO"). The Midwest ISO was formed in 1998. It is the first entity found by the Federal Energy Regulatory Commission ("FERC") to be a Regional Transmission Organization ("RTO"). The Midwest ISO did not originate from a legislative mandate or against the backdrop of a tight power pool, but from voluntary action.

The Midwest ISO's region covers portions of fifteen states and the Canadian province of Manitoba. Of relevance to your inquiry here, we act as a Reliability Coordinator for two sets of companies: one who are our members and a second set in the Mid-Continent Area Power Pool (MAPP) region that have not transferred control of their transmission systems to the Midwest ISO. As Reliability Coordinator, the Midwest ISO monitors, plans, conducts analyses regarding the high voltage grid and communicates with the Control Areas in our region who have the primary control capabilities to open and close transmission circuits and to redispatch generation. Three of the more than 30 companies within our reliability coordinator territory suffered outages in the blackout of August 14, 2003.

Mr. Chairman, as you know your letter of invitation to this hearing asked us to respond to the recommendations contained in North American Electric Reliability Council's ("NERC") February 10th Report on the August 14th blackout. The recommendations which most directly apply to the Midwest ISO are found at Attachment A Section (B) to Recommendation 1 of the NERC Report which is included at the end of my testimony. I would like to specifically address each one of the NERC recommendations as they apply to the Midwest ISO.

## CORRECTIVE ACTION #1—RELIABILITY TOOLS

In order to meet and exceed our duties as a Reliability Coordinator, the Midwest ISO utilizes a variety of tools, which we continue to upgrade and enhance as new capabilities become available. Those tools were already in the process of being upgraded prior to the August 14th events, but those events have prompted the acceleration and further expansion of those enhancements.

In August 2003, the Midwest ISO was using two primary tools for reliability coordination: a status change alarm log and a flowgate monitoring tool with a static contingency analysis tool. While this tool set was substantial, it left us highly dependent on information from Control Areas within our region for the most accurate assessment of the status of the grid. When incorrect, incomplete or no information was provided, we were at risk of being unaware of significant operating events. Our systems also lacked extensive visibility into our neighboring systems, and as with our own region, were dependent on others for some of the data that was used to run the tools.

Prior to August 2003, the Midwest ISO was already working to improve its capabilities. We were developing a State Estimator to model the current status of the transmission network and to use as a basis for contingency analysis and other real-time monitoring tools. At that point in time, we had already modeled over 60,000 data measurement points, but the model was not stable enough to be used as a primary reliability-monitoring tool. Since that time, we have added an additional 28,000 measurement points and stabilized the model. On December 31, 2003 this tool was promoted to be the primary tool for monitoring the real-time status of the transmission system. This reliability tool is a comprehensive model of the transmission network. It monitors and measures the status of all transmission lines and transformers over 230 kV (as well as all others identified as being critical to system operations) and the status of all generating units in our region. Our model also includes the first control area adjacent to the Midwest ISO area for most of our neighboring systems, and we are working to finish the modeling into all of the other neighboring control areas. The State Estimator runs every 90 seconds and provides a detailed updated view of the entire system.

We also have a contingency analysis tool that runs on every third run of the State Estimator. This tool analyzes approximately 5,000 different potential contingencies identifying potential problems on the system. Our modeling personnel continue to work to improve these tools by working with Control Areas both within our region and in our neighboring systems to improve the information and integration of the system. We are also working to improve the speed of these tools. Our goal is to significantly improve the solution rate while we also increase the number of points being monitored.

The identification and management of transmission and generation outages is a critical part of any reliability coordination effort. Within the Midwest ISO region, all outage information is received from the equipment owner via a real-time data exchange. This information is automatically incorporated into the State Estimator model. The Midwest ISO is continuing to work to increase the availability of real-time outage information from neighboring systems. In August 2003, data from neighboring systems was all received via an industry standard interface that is not a real-time exchange tool. Through the joint operating agreement recently executed with PJM, our neighboring RTO, our two companies have worked to create the infrastructure for the real-time exchange of operating data, including outage data between regions. We expect to be exchanging real-time outage information with PJM by May of this year. We are attempting to negotiate the same real-time exchange of outage information with our other neighbors.

In order to better utilize the vast amounts of data available to our reliability coordinators, a great deal of effort has gone into developing tools to sort out the most critical data and provide alarms properly identifying the significance of that data. Since August 2003, the Midwest ISO has substantially upgraded its alarming systems. We have increased the identification and integration of information through increased alarming levels for change of status Megawatt, MegaVar and kV limit measurements. We have also improved the presentation of the alarms through the use of increased alarm grouping, color-coding and limit threshold adjustments. The Midwest ISO is continuing to explore and evaluate additional improvements to our alarming capabilities.

We have taken considerable efforts to provide redundancy and backup for our reliability tools. These efforts have several dimensions. First, all our reliability tools have at least one other tool that can provide similar information. For example, if our State Estimator became unavailable for any reason, we would use our flowgate-monitoring tool as an alternate means of monitoring the system in real time. And

if our contingency analyzer was unavailable, we could also use our flowgate-monitoring tool as the backup.

Also, each of our computerized reliability tools has a redundant version (software and hardware) on site and in the event of a failure of the primary system; the redundant system would automatically take over its operation. Our building and computer room electrical supply and communication systems have built in redundancy as well. Finally, in the event of the complete loss of either our Carmel, Indiana or our St. Paul, Minnesota facility, they are backed up at an alternate location. The Carmel facility has a permanent back-up site near downtown Indianapolis, and the Carmel facility provides backup for the St. Paul facility.

We believe the steps necessary to implement this NERC recommendation have been completed.

#### CORRECTIVE ACTION #2—VISUALIZATION TOOLS

In order to rapidly analyze and respond to system anomalies, it is critical to provide our reliability coordinators with tools to quickly visualize the portions of the system where the anomaly exists. Prior to August 2003, the Midwest ISO was highly dependent on input from the Control Areas in our region in order to visualize problems. Evaluation of the blackout events made it clear that this dependency raised concerns. The Midwest ISO has taken steps to eliminate that dependency and provide our operators with the tools to rapidly visualize system problems. Since August 2003, we have developed and implemented visualization tools that allow our operators to monitor the system in greater detail and on a wider geographic basis. As operating situations dictate, the operator can then narrow his view to see smaller and smaller segments of the system down to and including one-line electrical schematic diagrams of individual substations to better identify specific problems.

The reliability coordinators now have an overview tool that allows them to monitor the Midwest ISO transmission system and surrounding areas on a real-time basis. This includes all 230 kV and higher transmission facilities along with all critical underlying facilities of 100 kV and above. The real-time overview includes information on real-time megawatt and reactive power values, voltage profiles and outage indications. As the operator needs additional detailed information, he can automatically access more detailed information on a specific area. This information can be displayed in a simple one-line electrical schematic diagram.

As part of this visibility tool enhancement project, the Midwest ISO also upgraded the video projection system in our Carmel, Indiana facility. The video projection system provides the ability for a large amount of real-time, dynamic, visual information to be displayed and viewed by several people in the control center simultaneously. The upgrade program included the addition of over 20 new video projection units more than doubling the display area in the control room.

We believe these enhancements go beyond the recommendations made in the NERC report.

#### CORRECTIVE ACTION #3—TRAINING

We believe that training is as important to providing reliable services as adequate tools. Prior to August 2003, the Midwest ISO had focused on recruiting experienced and skilled operators to staff our control room. The blackout event highlighted the need to increase our training efforts. The Midwest ISO has developed a comprehensive training plan that we are currently implementing. By June 30th, each of our reliability coordinators will have completed at least five days of system emergency training as recommended. That requirement will continue on an annual basis and will also be developed to include performance assessments of each reliability coordinator in a training mode. This training will consist of a combination of activities including the following:

- Regional Emergency Response Drills—The Midwest ISO will participate in regional drills with MAPP, Mid-America Interconnected Network, Inc. (“MAIN”) and East Central Area Reliability Council (“ECAR”). These drills will also involve member control area operators and in some instances other reliability coordinators such as PJM. The Midwest ISO will assess our reliability coordinators participation in the drills through observations and in debriefing sessions following the drills.
- Table Top Emergency Drills—The Midwest ISO will use a series of one-day tabletop drills that will involve varying combinations of Midwest ISO staff and control area operators from our membership. These drills will be fact specific and scenario driven to test staff’s performance in response to hypothetical problems. The Midwest ISO staff’s performance will be evaluated and appropriate actions taken.

- Emergency Training on a Training Simulator—The Midwest ISO is developing training scenarios for use with our training simulator. The initial scenarios will involve two-day sessions where individual operator performance can be assessed and compared to other operators working on the same simulations. This training will occur during the 2nd quarter of 2004.
- Operating from Back-Up Control Center Drills—The Midwest ISO will train our operators on a range of emergency conditions including those that involve the loss of our primary control center with the accompanying need to transfer operations to our back-up facilities in a rapid manner.
- Training on Emergency Operating Guides—All Midwest ISO reliability coordinators are required to review and understand all standing, temporary and emergency operating procedures applicable to their jobs. This self-study is reviewed with the operators by their supervisors on a regular basis.
- Emergency Communications and System Restoration—This is a three-day training course that focuses on communication skills, critical thinking (including the application of those skills to system operations) and restoration activities. Participants in this training will be assessed through an exam provided at the end of the course.

This recommendation will be met by the June 30, 2004 deadline.

#### CORRECTIVE ACTION #4—COMMUNICATIONS

Following the events of August 14th, the Midwest ISO reevaluated our communications protocols and procedures and implemented significant improvements, including:

- Working jointly with our membership to develop and implement an Emergency Response Procedure directive that clearly states the definition of a system emergency, the criteria for a system emergency and the emergency actions that will be taken to resolve such an emergency.
- We also implemented our Conservative System Operating Procedures that defines events and conditions that warrant implementing more conservative system operating procedures and lists the procedures, and communications needed to implement those procedures. In addition, our joint operating agreement with PJM obligates both parties to operate to the most conservative limit on all jointly monitored flowgates and equipment. This condition allows both companies to assure reliable operation of our systems.
- Midwest ISO reliability coordinators are obligated to post critical outage information to the NERC communication systems to update neighboring Reliability Coordinators. We believe the steps necessary to implement this recommendation have been completed.

#### CORRECTIVE ACTION #5—OPERATING AGREEMENTS

Transmission system reliability depends on the ability of the Reliability Authority to not only identify problems and rapidly design solutions, but also on the authority to order users of the grid to implement corrective measures. As recommended, we have also reviewed our authority to direct corrective action over those parties to whom we provide reliability coordination services. These entities fall into five categories summarized below:

Transmission owning members of the Midwest ISO—Our authority over this segment is clear and reinforced by several sources. First, FERC Order Nos. 888<sup>1</sup> and 2000<sup>2</sup> make clear the role of the ISO/RTO in providing reliability (security) coordination to its members. Additional FERC regulations on the operational authority and short-term reliability authority of RTOs further reinforce that authority.<sup>3</sup> In addition, the Midwest ISO Transmission Owners Agreement and the Midwest ISO Open Access Transmission Tariff also both provide explicit authority for reliability coordination.

- Independent Transmission Companies (ITCs) who are members of the Midwest ISO—Our sources of authority over this category is very similar to that shown above, and is addressed in Appendix I to the Transmission Owners Agreement that deals specifically with ITCs.

<sup>1</sup> Order No. 888, 61 Fed. Reg. 21,540, FERC Stats. & Regs. ¶31,036 (1996).

<sup>2</sup> Regional Transmission Organizations, Order No. 2000, 65 Fed. Reg. 809 (January 6, 2000), FERC Stats. & Regs. ¶31,089 (1999) (Order No. 2000), order on reh'g, Order No. 2000-A, 65 Fed. Reg. 12,088 (March 8, 2000), FERC Stats. & Regs. ¶31,092 (2000) (Order No. 2000-A).

<sup>3</sup> 18 CFR § 35.34 (b)(3) and (4) (2003).

- Non-transmission owning users of the transmission system, including non-member generators—Our primary source of authority in this instance is the FERC approved Open Access Transmission Tariff, which contains specific requirements to follow the direction of the Midwest ISO to relieve loading problems, and provides for monetary penalties in the event of failure to comply.
- Companies not members of the Midwest ISO, to whom the Midwest ISO provides reliability services under contract. This category currently includes members of MAPP that are not members of the Midwest ISO. Under this category, we have a contractual arrangement with the MAPP reliability region of NERC (and prior to October, 2003 with the ECAR reliability region) to fulfill their contractual obligations with their members. We do not have a direct contractual relationship with the Control Areas themselves and we obtain our authority through MAPP's relationship with its membership.
- Canadian Province—The Midwest ISO has a coordination agreement with Manitoba Hydro under which we act as Reliability Coordinator for their transmission facilities. The agreement specifically lists the responsibilities of the Midwest ISO as Reliability Coordinator. However, it does not obligate Manitoba Hydro to follow the directions of the Midwest ISO. Due to the unique international relationships involved in this contract and the nature of Manitoba Hydro as a Canadian Crown corporation, they are unable to make this contractual commitment. However, this agreement is the most comprehensive of its type between Canadian and U.S. companies within the industry. The working relationship between the companies has been outstanding and Manitoba Hydro has always voluntarily complied with our directions as their Reliability Coordinator.

In addition, the Midwest ISO will soon file with the FERC a "Reliability Charter" with many Midwest entities that identifies in specific detail the roles and responsibilities of each entity to maintain system reliability. We are also planning to work with the NERC Operating Committee in its efforts to revise the operating policies and procedures to ensure reliability coordinator and control area functions, responsibilities, and authorities are completely and unambiguously defined, as described in NERC recommendation 9.

We believe the steps necessary to implement this recommendation have been completed.

Mr. Chairman, the Midwest ISO fully supports the remaining NERC recommendations contained in the Blackout Report. I would like to comment on some of the other specific recommendations. Recommendation 3 addresses an improved audit process so that all Control Areas and Reliability Coordinators will be reviewed on a three year cycle. While the recommendation proposes to audit only 20 of the highest priority entities by June 30, the Midwest ISO would support increasing the number of first year audits. We would also support NERC adopting a policy stating that an entity that commits a significant or repeated violations of reliability standards will be placed on an annual audit cycle until NERC is satisfied that the problems have been corrected.

The Midwest ISO believes that Recommendation 4 concerning vegetation management should not merely rely on reporting vegetation related outages but should establish minimum line clearance standards to avoid contacts in the first place. This is an area where Reliability Coordinators like the Midwest ISO must continue to rely on local Control Areas to maintain the integrity of the system.

In general terms we would recommend that NERC operating policies should be issued in the form of specific standards and efforts should be made to eliminate vague or ambiguous language.

Mr. Chairman, to look beyond the recommendations in the NERC Blackout Report, we believe increased reliability can also be achieved through agreements between interested parties. The Midwest ISO is actively exploring additional agreements to ensure greater reliability. It has recently executed a joint operating agreement with its neighboring RTO—PJM—that allows for greater management of the intertwined seams in the Midwest. In the joint operating agreement, we have committed to data exchange and other features that will allow each to be assured of the others performance of tasks to protect the reliability of the regional grid. By having that agreement on file with the FERC, FERC can also serve as a forum for resolution of any future dispute on performance that the parties themselves cannot resolve. Likewise within the Midwest ISO's own region, the terms of the Midwest ISO's tariff are contractually binding on customers and users. These are measures in place today that can be expanded.

Mr. Chairman, you also asked for our views on the reliability provisions contained in the Conference Report on H.R. 6 and the identical language found in S. 2095

which you recently introduced. The Midwest ISO strongly supports this legislation. We believe that establishing an Electric Reliability Organization reporting to the FERC that develops clear reliability standards and providing that Organization with the authority to impose penalties for violations of the reliability standards would be effective in ensuring a more reliable bulk power system. Thank you for your time and I would be happy to answer any questions you may have.

CORRECTIVE ACTIONS TO BE COMPLETED BY MISO

MISO shall complete the following corrective actions no later than June 30, 2004.

1. Reliability Tools. MISO shall fully implement and test its topology processor to provide its operating personnel real-time view of the system status for all transmission lines operating and all generating units within its system, and all critical transmission lines and generating units in neighboring systems. Alarms should be provided for operators for all critical transmission line outages. MISO shall establish a means of exchanging outage information with its members and neighboring systems such that the MISO state estimation has accurate and timely information to perform as designed. MISO shall fully implement and test its state estimation and real-time contingency analysis tools to ensure they can operate reliably no less than every ten minutes. MISO shall provide backup capability for all functions critical to reliability.

2. Visualization Tools. MISO shall provide its operating personnel tools to quickly visualize system status and failures of key lines, generators or equipment. The visualization shall include a high level voltage profile of the systems at least within the MISO footprint.

3. Training. Prior to June 30, 2004 MISO shall meet the operator training criteria stated in NERC Recommendation 6.

4. Communications. MISO shall reevaluate and improve its communications protocols and procedures with operational support personnel within MISO, its operating members, and its neighboring control areas and reliability coordinators.

5. Operating Agreements. MISO shall reevaluate its operating agreements with member entities to verify its authority to address operating issues, including voltage and reactive management, voltage scheduling, the deployment and redispatch of real and reactive reserves for emergency response, and the authority to direct actions during system emergencies, including shedding load.

The CHAIRMAN. Your statement is in the record.

Mr. TORGERSON. Yes, sir.

The CHAIRMAN. Thank you very much. I noted that Senator Talent arrived after the four of us and I wanted to just put you in the same position. We asked each Senator if they wanted to make a few comments briefly before we started questioning, and I would ask you that now, Senator?

**STATEMENT OF HON. JAMES M. TALENT, U.S. SENATOR  
FROM MISSOURI**

Senator TALENT. Mr. Chairman, I will just say that I'm deeply concerned that unless we take the kind of steps that these witnesses have recommended and that we had in the bill, that we are going to be looking at another blackout and it's just a matter of time.

The CHAIRMAN. While the Senator makes that statement, let me just state for the record for those who are listening and of concern, we have three, is that correct, what we would call major blackouts, including this last one as I understand it. And in 1965, we had the Northeast and they lost 20,000 megawatts, 30 million customers. In 1996, Western blackout, 28,000 megawatts, 8 million customers. I do not see anybody disagreeing. And then 2003, on August 14, the blackout was 62,000 megawatts, affected 50 million customers and cost ultimately about \$5 billion.

As you recall it as experts, is that a pretty good summary of major ones? Well, Senator Talent, I just thought that following your remarks and knowing that we have not underloaded since these, if anything, they are loaded more because there has not been great investment for one reason or another. And they are loaded more and more because people want what they sell. That's your prediction? You better try to find out a way to fix it or we are going to be sitting here with Americans seeing us and saying that what good were they.

Now, having said that, I have a lot of questions, but I'm going to just change a bit and let you go first, Senator Bingaman, and I will go—or one of the other senators. We are going to try to get out of here, everyone, by 12, so if you can keep your answers short, we'll all keep our questions short.

Senator BINGAMAN. Mr. Harris, let me start with you. It appears to me we have got, although both are considered ISOs, a big difference between the way that PJM is organized and the way that MISO is organized. You have much more central control of PJM. As I understand it, there are 23 different control areas in MISO, is that correct?

Mr. HARRIS. Yes. There are 23 that are transmission owning members. We actually have reliability coordination over 35.

Senator BINGAMAN. Well, when this blackout occurred last year, my impression is that it cascaded until it got to the boundaries of PJM, and then it stopped. And that would lead me to conclude that you were doing something there that they should have been doing in MISO at the time, am I right about that? Is there some way that you organize your requirements on reliability there at PJM that we need to try to replicate across the country?

Mr. HARRIS. I think there is a dual answer there. In the first place, once the cascade starts, it rips, basically at the weakest links. And so the question is why it ripped where it did is up to a lot of study. But it seems to me there are certain things that are being done.

One of these is the fact that we do precontingency planning. We dispatch looking at the thousands of things that could possibly be a worst case event and those things that were analyzed that we are always in a state that we can deal with that.

Secondly, we price in a way that the generations can respond based upon the price signal when you have congestion and a problem. So the precontingency dispatch and the price are two tools that are tremendously valuable.

The third thing is authority. We have the sole authority to declare emergency, to direct emergency and to declare the end of the emergency and everyone has to abide by authority.

Senator BINGAMAN. So those are three ways in which you try to head this off, and you think those served you well in this circumstance?

Mr. HARRIS. Correct.

Senator BINGAMAN. Mr. Torgerson, do you have anything like those same provisions in place there in your ISO?

Mr. TORGERSON. As of right now, we do not do dispatch of the generation from the market as Mr. Harris does. We will. We have plans to do that starting December 1 of this year when we'll ini-

tiate the market in the Midwest which then we will be sending the price signals to all the generators. So that will be added and that's—we'll have the market.

To be able to have the same authority, we do have the authority to tell people to redispatch, to shed load, to do the same activities Mr. Harris does, but we do not have the ability right now to direct generators like he does because he runs the control area, which we will have in the future. So there are some differences right now. They should narrow quite a bit by the end of this year.

Senator BINGAMAN. Would you agree that the centralized control that they have been able to develop or acquire there at PJM would be a help in heading off these kinds of blackouts in your area in the future?

Mr. TORGERSON. I think between the tools we have implemented already that I mentioned in my remarks and in my prepared testimony, and couple that with having the market like Mr. Harris has, I think would be very beneficial in heading off blackouts in the future.

Senator BINGAMAN. Ms. McCarren, let me ask you in the West, as I understand it, a number of operators in your region have not joined in signing the contracts that make your rules enforceable, is that right?

Ms. MCCARREN. Yes, Senator, and that list appears in my testimony.

Senator BINGAMAN. You might push that button. I don't think you are being heard.

Ms. MCCARREN. Apologize. Yes, there are a number. They appear on page 6 of my testimony at a footnote. We are working very actively with several of them to convince them of the value of being in the RMS, our contractual reliability plans. And I think we will be making some headway, but there are some significant outliers, Senator.

Senator BINGAMAN. This is something we need to get a resolution of, it would seem to me, if we are going to head off blackouts in the future, would you agree with that?

Ms. MCCARREN. I do. The FERC has been very helpful to us and very tuned into this issue of entities that are not signatories. And so we are hoping to have some help from them as well.

Senator BINGAMAN. And do they have the authority at this point to order, to order these utilities to participate?

Ms. MCCARREN. No. They do not. But we certainly have the power of persuasion.

Senator BINGAMAN. And they are beginning to use that?

Ms. MCCARREN. Yes, Senator.

Senator BINGAMAN. Okay. It seems to me that having strong RTOs or ISOs is an essential part of dealing with this problem. It's not just that we need a better set of reliability rules or a better backup mechanism to enforce them. They are sort of on the ground responsibility for avoiding these kinds of blackout problems in the future. It comes down to the RTO or the ISO. Is that a correct view of things or incorrect in your opinion, Mr. Harris?

Mr. HARRIS. Yes, Senator. I think it's exactly correct. I think the other value that a large RTO brings is in the regional planning. All entities come together in our area and participate in the planning

from environmental groups to the various States to the citing authorities. They all participate and we are able to look at the entire region as it's seen and operated, how it's growing and the needs of new generation, including the green generation coming on and make sure those needs are met in a least cost efficient way is another tremendous value of RTOs.

Senator BINGAMAN. Thank you very much. I think that this light here means I have used my time, so I will quit.

Senator THOMAS. Okay, thank you. The chairman had to step out for a moment. He will be back very shortly. Mr. Glotfelty, do you—2 years ago, a national transmission grid study was called for a designation of national interest transmission bottlenecks. Are you finished with that? Are you doing that? What has the Department done on that?

Mr. GLOTFELTY. We have, we have begun the process. We have completed a draft Federal Register notice to submit to the Federal Register to bring parties in to give their views of what a national interest transmission bottleneck is.

As you know, provisions or something similar to a national interest transmission bottleneck designation was included in the energy bill conference report. And we were trying to proceed as much as we could on our own free will before we understood what the Congress wanted us to do.

So since the Congress—the Congress has not completed their energy bill, we feel it's important that we continue to go, continue to move forward on national interest transmission bottleneck designations, figure out the criteria by which we will designate those in the future and hope that Congress will pass the energy bill and give us a little bit more direction as we go through our process.

Senator THOMAS. I just mention it's 2 years and going on, that's quite a while. It looks like perhaps we could have done something by now. Mr. Gent, what do you think we have to have, can you have mandatory or enforcement reliability without legislation?

Mr. GENT. Senator, it's very difficult as I stated in my written testimony. Today everybody is dedicated to having a reliable system. As time marches on, I'm afraid that we'll have what I call a reliability or risk creep. The only tool we have right now is to have disclosure of violations and that's the tool that we are going to use. We are working hard to come up with a uniform way of disclosing violations to the rules and we'll have that in place or have that decided within a month.

Senator THOMAS. You mentioned in your statement a number of times that you point out violations some, but you have no way of enforcing it, is that right?

Mr. GENT. That's correct.

Senator THOMAS. Mr. Harris, in your statement you sound as if you do not need any authority. That everything's great.

Mr. HARRIS. Well, from the operation of PJM as an RTO, that's correct. You know, we are actually operating day-to-day—

Senator THOMAS. But you are not an RTO.

Mr. HARRIS. Yes, sir, we are.

Senator THOMAS. No. It depends on how you define it.

Mr. HARRIS. Well, we are FERC approved as a regional transmission organization.

Senator THOMAS. What about the State's role as individual States? Do they have any input?

Mr. HARRIS. Absolutely. We have a separate agreement with our States. We have a memorandum of understanding where the States come in, they participate with the board, they give advice to our board, we meet with the States in our regional planning context and it's a very healthy relationship that we have with our States.

Senator THOMAS. But you do not have them all involved?

Mr. HARRIS. Well, all of the States that are currently under operational construct are. We are in the process now of integrating AEP Dayton, Dominion out of Virginia and Commonwealth Edison. Of those States, five of those States plus the District of Columbia are supporting moves to get AEP into PJM as soon as practicable.

The States of Virginia and Kentucky are asking questions and hearings are still going on there.

Senator THOMAS. That's not really how we'd like to see it, though, is it? Wouldn't we like to see RTOs that are, that are coming together because the States decided to do that, and then the companies in those States would be part of it?

Mr. HARRIS. Yes. When we look at the genesis of how PJM was formed, it was because we spent the years of doing the due diligence and the analysis and review as to what is the most beneficial good for the public. How does the consumer benefit over what the status quo is?

And I think those kind of questions need to be asked and need to be addressed in a public forum, but also need to be done in a timely way because the value proposition as we are seeing is huge.

Senator THOMAS. In the West also, we do not really have an RTO, do we?

Ms. MCCARREN. No. In the Western Interconnect, no RTO has been effectively formed. Thank you. And in response to the question from Senator Bingaman, I believe very strongly that in the absence of those RTOs, there is even a bigger role for mandatory reliability standards and the role of the three reliability coordinators we have in the West. So no, there are no RTOs at this time.

Senator THOMAS. One of the reasons we do not have an energy bill and one of the reasons we aren't able to do this is because the States want some State authority here. And they—that's why I think regional RTOs that are put in by States and not by other ways are what we have to do if we are going to get something done, and particularly in the West. We had States that did not want to participate and Federal—Federal like Bonneville. Do you have any involvement or control over the Government agencies?

Ms. MCCARREN. We have—Bonneville is a signator to the RMS and almost all of the State, the public entities are members of WECC. And yes, they do participate. And it's voluntary, as you said.

And in addition, we have the two Canadian provinces which of course are completely non-jurisdictional.

Senator THOMAS. I see. Just one final, I guess. Do you—do you think, Mr. Gent, that the transmission system is—has investment to keep up with the demand?

Mr. GENT. I think the evidence is rather obvious that it has not. It's a sad commentary that we put in all sorts of generation over

the last decade and we have not put in the companion transmission to get that generation to market.

Senator THOMAS. Actually, we have not put in enough generation to meet demand either, for that matter.

Mr. GENT. Some of the generation that we put in is locked in by the transmission.

Senator THOMAS. Yes. Do you give any thought to third party operators for transmission?

Mr. GENT. To NERC and the Regional Reliability Council's third party operators make no difference. It's just a matter of ownership. What we care about is whether they play by the rules or not. And it's quite likely that new entities that have lots of transmission are going to be very concerned with playing by the rules.

Senator THOMAS. Playing by the rules is sometimes a little difficult to get different operations to be able to participate in the transmission. They just get much less, isn't it?

Mr. GENT. Currently, we do not have trouble with the transmission operators. I think the problem here is the transparency, even though they may be audited or they may undergo compliance audits, nobody knows what the results of those audits are. So we are taking steps to make sure that NERC and the general community is aware of what the results of the audits are.

Senator THOMAS. Again, if you paid any attention at all to what we were doing with our energy bill, you would discover that some of the places this whole idea of availability of space on transmission is part of the problem.

Mr. GENT. Yes.

Senator THOMAS. That's part of the reason we did not get it finished and we have to do something about that in the future. Thank you.

The CHAIRMAN. Thank you, Senator. Senator from Louisiana.

Senator LANDRIEU. Thank you very much. And I really appreciate all the comments made, and Mr. Harris, yours in particular, for the way you not only described your involvement in the industry, but generally how complicated this is, which is why it's been extremely difficult for us to try to put together a comprehensive piece of legislation of which electricity is only one part.

We have thousands of entities that have developed with different rules and regulations, but we are clear on this committee that while we believe that competition and efficiency could work to reduce prices and establish a greater, more positive outlook in the future, without the reliability section being done, we could really create some serious havoc and problems.

That's the struggle that our committee is moving through to try to figure out the different views of the different States and constituencies, whether to have voluntary or mandatory RTOs and checkpoints for reliability.

One of the issues that I have been focused on is this participant funding issue, which I have argued as representing a region and that seems from what I know to be able to produce more electricity than we consume. We are a fairly large consumer of electricity. We have a lot of industries, a lot of power, you know, powerplants, cogeneration, et cetera.

But we are not opposed to being part of a national system if it was done in a fair manner, and I have argued that not sufficiently to get votes of everyone up here, but participant funding is a fair way to go about allocating costs associated with having to invest more in the transmission line.

In other words, if generators, once it sells, think they have a market for their electricity, then they should be willing to pick up part of the cost of that and not have it on the ratepayers of States like Louisiana when we are already producing and consuming as much electricity as we need and shipping it everywhere else.

I keep saying "why should the ratepayers in Louisiana pay additional rates so that Illinois can turn their lights on, and New York can turn their lights on?" I mean, I want to help them turn their lights on but I'm not willing to pay for them to turn their lights on. So I've argued about participant funding being maybe a fair way, not for them to pick up the total cost, but for them to pick up the costs associated with their need.

You indicated that that's what you all do so could you explain maybe to the other members and maybe make a comment about how that system in your mind is fair because some people aren't for that system up here.

Mr. HARRIS. Certainly I'd be happy to, and also there is something that Senator Thomas said earlier on planning. Let me try to connect the dots on how it works and how it works very well. The electrical system is like an ecology system. One thing affects everything else.

So when you are planning and changing, okay, that has to be studied in the whole. That's where an RTO comes in because you have got an independent staff to do total, complete planning.

Now, we need generation. We need to have transmission. The variables that affect that are your load growth, any operational bottlenecks like we talked about with reliability. And then ultimately deciding decisions for a different generating plant.

Every time a generation plant comes on, they choose where they want to locate, the size they are and the kind of generation mix you are going to have, whether it be a coal, gas, nuclear or whatever that plant may be.

So what you do through participant funding is we have a requirement and, Senator Thomas, it's actually a requirement our States insisted that we put in there. And that is, that when a new generation plant comes on, we do what is called a simultaneous feasibility deliverability test.

Now, all that means is that when you come on line you have to move your power anywhere without any constraints happening. So we analyze the system, looking at these other variables, okay, and any build that needs to be made to be able to allow that plant to come on and move their power without constraints, they have to pay for it, okay?

And that is very valuable, because what happens in our area, for example, we have had over 11,000 megawatts of generation, and every time we add, we are building transmission, support it, and you are adding to the reliability of the grid, and it's able to move without congestion. Okay. That's the beauty of participant funding.

Now, it doesn't cover 100 percent of the cost because you have to look at the other variables. Now, about 65 percent of our \$700 million was funded that way, and you really do not need legislation. The Federal Regulatory Commission approved this for us in 1998 and we have been utilizing that process ever since.

Senator LANDRIEU. So in other words, when a generator comes on, when a generator wants to site into a State, they basically have to pick up according to the model that you've used about 65 percent of that cost?

Mr. HARRIS. Whatever the planning study says they need to do. It takes an analysis to determine what you need to. The important thing is you say that power has to be moved throughout the region and then whatever that transmission is necessary to enable them to do that, otherwise you are degrading the system and you are forcing, like you say, others to pay for it.

And what we found is when you can do the analysis and when you have the competitive wholesale markets, people are willing to pay those costs in order to get on line and you are adding to the reliability of the grid. It works.

Senator LANDRIEU. Mr. Chairman, I'd really like us, you know, to pursue more, maybe not at this time, this particular model. It might help us to get through one of the more contentious arguments about the piece of our bill on which we have gone back and forth, some want participant funding, some do not. Maybe this model, with some adjustments to it, could help us get over that barrier and get over that hurdle because it's very, very important.

That's generally what I wanted to say. I will hold my other questions until later.

The CHAIRMAN. Thank you very much. Let us see, Senator, if you are ready.

Senator TALENT. Thank you, Mr. Chairman. Well, Senator Landrieu and Senator Thomas have gotten into the issue that interested me in particular because it seems to me we have got a lot of agreement on the committee about the importance of mandatory reliability type organizations and regulations.

But then the other issue is less enforcement on existing lines, but investment so that we can get new lines as needed. Mr. Gent, you said it's kind of an offhand comment, something Mr. Thomas was asking at the end. You mentioned that it's a matter of ownership. Would you go into that a little bit more? Did I hear you correctly?

Mr. GENT. I was referring to transmission organizations that take ownership and operate transmission. I think DTE Energy, Detroit Edison is a good example. I think they sold their system to ITC, so it's a different ownership, but the operation continues to be proper and in line with the reliability rules.

Senator TALENT. Right. Now, were you suggesting that ownership might matter in terms of incentives to invest in the grid or in your opinion, is that unimportant, given—assuming that we have RTOs that are adequately empowered the way Mr. Harris was talking about?

Mr. GENT. Senator, it's probably very important to someone, but to me I'm interested in how the grid operates so the ownership doesn't come into that picture.

Senator TALENT. Okay. I'm kind of—when I mention things like that, I know I'm sort of throwing the hagus in the fire a little bit on a very difficult issue. But let me address that more generally.

If we empower NERC or the RTOs or both in terms of enforcing reliability on existing lines, or insisting on investments either through participant funding or in some other way in new lines where necessary, do we need at some point to go into ownership issues in the judgment of those here at the panel or can we ensure adequate investment, notwithstanding differing incentives that might depend on who owns what, if somebody owns the lines or not. Would anybody like to offer a comment on that? Yes.

Mr. HARRIS. Yes. Senator, I think one thing to keep in mind is that the investment that's necessary is what is necessary to make sure you have a reliable grid. And over the past 6 years, what we have discovered in a highly congested area here in the Northeast and the Mid-Atlantic, up and down the Atlantic Seaboard, is that most of the value you get for transmission reliability and upgrades is in the components, not the lines.

Once you do the studies and you look at the generation coming in, the demand side response that want to come on, it's by operating substations, putting in smarter technology for control systems, better transformation. And the lines that you do have to build are actually coming out to be short segment lines, as opposed to having to build a long—

Senator TALENT. Interesting. And you had full—I'm sorry, and you have full authority in your RTO to order such investments as you think are necessary to protect the reliability of the grid? Is that true?

Mr. HARRIS. That's correct, we do, yes, sir.

Senator TALENT. That's not always true, though, for RTOs around the country, is it?

Mr. HARRIS. No. I think under FERC Order 2000 there is the requirement once you become fully functional that the RTO would have that authority, but I'm not, I don't think everyone but PJM has that right now.

Senator TALENT. Well, let me just hone in then and ask generally, I mean, if—when we talk about investment issues and we talk about RTOs or mandatory reliability, if we take care of the latter, can we have confidence that we are taking care of the former?

In other words, if we adequately empower RTOs or NERC, can we just let the system work then and assume that there will be adequate investment, as well as operation of the existing assets?

Mr. HARRIS. It takes both. You have a standard which NERC does to make sure that people are operating at a certain plateau, but once you get there, then you have to actually have a process to take the different and multiple competing entities to allow them to allocate the resources that would be in the best public good. And that's the day-to-day operations of an RTO, reasonable planning, State coordination, all of that comes into actual running of the grid, so it's a partnership.

Senator TALENT. So NERC and the RTOs together will do that if they are adequately empowered without any other changes, is that your opinion, Mr. Gent? Do you want to offer an opinion on that?

Mr. GENT. Yes. I think Mr. Harris has stated it exactly right. We can operate the existing system reliably whether it has an adequate amount of transmission or not. To be able to conduct commerce and business the way RTOs are meant to conduct business, we need more transmission. So we can operate the system whether we have more or less.

Senator TALENT. But just empowering you all isn't necessarily going to produce that more transmission, right?

Mr. GENT. That's right. Mandatory standards will make everybody on an equal plane, but it won't provide us with additional transmission.

Senator TALENT. Although Mr. Harris said that you can require additional transmission capabilities as new plants come on line, so there—to some extent you can, right?

Mr. GENT. That's correct.

Senator TALENT. One other thing then, Mr. Chairman, I appreciate your indulgence. The uncertainty surrounding all this is itself a problem, isn't it? In other words, I certainly can understand, if I'm a company that owns generating and transmission facilities and I'm not sure how much ownership or control I'm going to have over the transmission facilities in a year, 2 years or 5 years because, you know, FERC is here and Congress is there, and that's not exactly a great incentive for me to make a big investment in those transmission facilities, is it?

I mean, it probably would be good if one way or another we cleared up some uncertainty. Mr. Torgerson, you look like you are stirring yourself to make a comment?

Mr. TORGERSON. Oh, no. I fully agree with that, sir. The investment in the transmission system needs some certainty from the FERC and from Congress as to what the rules of the road are going to be. The dollars from investment I have heard from people are pretty much sitting on the side lines until the rules of the road are set.

So it may very well be, and Mr. Gent, I blame you for bringing up this whole ownership thing. But it may very well be that regardless of exactly where we go on the ownership issues, that if we just settle that and then sort of regulate in light of that context, that we can make maybe any kind of system in that regard work from a reliability standpoint once we know what it is, and you all can regulate around it. Is that fair? You are all nodding your head. Okay. Thank you, Mr. Chairman, I appreciate it.

The CHAIRMAN. A little while ago you thanked me for what?

Senator TALENT. For indulging me. Because I think I went over my time.

The CHAIRMAN. Yes, you did. And my indulgence was running thin, but you did very nicely.

Senator Cantwell.

Senator CANTWELL. Thank you, Mr. Chairman. Mr. Gent, your testimony couldn't be more clear in that basically you say that had the legislation been passed on reliability, we would not have had the August 14 blackout and that you request that Congress enact this reliability legislation this year.

Do we need to enact any other legislation or just—by that I mean, do you need to enact any other legislation than the reliability legislation to make reliability work?

Mr. GENT. Senator, there are a number of other things that would help reliability work. More transmission would help. Certainly would help. But from my own perspective as the CEO of NERC, we need the reliability legislation and I understand that there is, there is a context for the vehicle in which that happens.

I have to leave that up to Congress to decide how you are going to go about doing this. But we do need the legislation.

Senator CANTWELL. But don't you think it's somewhat irresponsible for us not to pass a reliability standard if in fact that's the only legislation we can pass?

Let me preface it by this. My predecessor, after a similar black-out in the Northwest, Senator Gorton, proposed this legislation and it did pass one body, not the other. That was the warning call. What happened in the Northwest was the warning call and people dropped the legislation, we passed it out of Senate and it was held up in the House.

Now we have had a worse crisis happen on the east coast and the same thing is happening. People are holding this reliability bill hostage to get other legislation. And I think it's irresponsible for us not to pass reliability standard legislation even if it's stand-alone legislation.

We can all agree, can't we, that this is actually needed legislation?

Mr. GENT. I agree.

Senator CANTWELL. Thank you.

The CHAIRMAN. Thank you very much. I think it's my turn for a few minutes. Let me just say, Mr. Gent, that may very well be the case that this is important. I think everybody says it is. But a lot of people would say that there are five, six, maybe 10 provisions in the energy bill that are very important also, and we are going to try our very best to get more than this. We are not trying to get—as implied, to kill this.

Quite to the contrary. It's already passed both bodies in conference and so we don't have the hangup that we had before. The hangup is whether we get a bill or not. And I do not think this is the hangup. So I just wanted to make sure you know that there are some other things. And sooner or later, we are going to get to the point where we move with the other bill or we start considering pieces.

I think that's still a ways off and I'm sorry to tell you that. Let me move to something that everybody in America, every time we have a problem in an area, be it six subdivisions in a part of Virginia or whether it's a blackout, what they see on their television sets for a week afterward or two weeks is the vegetation issue. The trees are falling down all over the lines, and you are borrowing crews right from all over.

Last time we had one they borrowed them from hundreds of miles away. I couldn't believe there were such good feelings that people would do that. But I guess I'm going to ask anyone that knows about this, I have not heard anybody come up with things

we ought to do to minimize these tree falling or hangover trees issue.

Does anybody have a suggestion for the record and for our people on what we ought to do about that? Mr. Harris?

Mr. HARRIS. Yes. Mr. Chairman, I think the thing to realize is that something is always failing on the electrical grid. It is an electromechanical system that we are talking about. It's a machine. It's what is running. We don't put electricity in our hands and say look at my electricity. You have a machine that's running. And something is always breaking and failing.

Therefore, the operations of that grid is crucial, and that's get into the things we are talking about with the contingency analysis, the State estimator tools that Mr. Torgerson and I have put in. So that you are always looking at the system as what is going to fail next, so you are always in a position to handle failure, not to prevent it, because these things are going to happen. People are going to run into a power line—

The CHAIRMAN. Yes, I understand.

Mr. HARRIS. Hurricanes hit and so forth.

The CHAIRMAN. But ultimately, some people are casting about the idea that we get rid of all of that, that the lines no longer be in proximity to trees. I would assume that's an enormous undertaking from the standpoint of cost and whether it can be done or not, is that a fair statement?

Mr. HARRIS. That's a fair statement, and there are just a lot of maintenance from vegetation to just how often you do breaker maintenance. All that needs to be done in some good practice, but things are going to fail because it's an electromechanical system. We need to plan for it.

Senator CANTWELL. Briefly—

Senator LANDRIEU. Could I follow up on that point?

Senator CANTWELL. Okay.

Senator LANDRIEU. If I could follow up on that point, how expensive is it to bury these lines? Is that a problem with the expense of it because burying lines in places and coordinating the cable system, to me, you avoid hurricanes, you avoid the trees? And, just to follow up with the chairman, is that even remotely possible in terms of the costs associated?

Mr. HARRIS. It's just cost prohibitive for your long lines and your long haul today. I mean, you are looking at 10 to 50 times the cost of putting them overhead and that's just extraordinary.

Senator LANDRIEU. But in the cities when you are digging up the streets anyway, like to lay telephone cable, is it not efficient to maybe also lay your electric cable while you are doing that? You are not adding much cost?

Mr. HARRIS. It's done considerably for new developments. Yes, ma'am.

Senator LANDRIEU. I would like to pursue that, Mr. Chairman, and I don't mean to take your time, but I'm glad you brought that up.

The CHAIRMAN. Well, all right. Senator, there is a major study and it says if you were to adopt it as a national policy, the costs are, you know, incredible. And I think somebody said that when they used the ratio a hundred times as much. Edison Electric es-

establishes the cost and I myself was wondering whether we could in some way promote it.

But the first thing that will be said is the Government pay for it and obviously we are not going to do that. We would never get anything passed, \$300 or \$400 billion to correct this problem.

Senator LANDRIEU. But you could grandfather some provisions and then new development could potentially as the grid grows and expands—

The CHAIRMAN. You could pursue, you know, something coercive with reference to doing the things together any time that new undergrounds are being built that would have the capacity to carry, we ought to be encouraging that you do them together. You are probably saying you do some of that already, is that correct?

Mr. HARRIS. Yes, sir.

The CHAIRMAN. Okay. Let me just move on to just a few. Mr. Glotfelty, Senator Cantwell before she left was recommending, I think was the only one today, that said that we ought to do a stand-alone reliability bill. I don't know whether your job or your expertise provides you with any observations, thoughts on that, but what do you think about that proposal?

Mr. GLOTFELTY. Thank you, Mr. Chairman. A few thoughts. First, as you know, it's been the administration's position for years now that we need a comprehensive energy bill, one that addresses more than just stand-alone reliability, one that addresses a wide array of the issues that are necessary to ensure that markets work and that we have a reliable transmission system.

We believe that those today are included in the conference report that the House and the Senate passed that is pending before the Senate. And we feel that it's absolutely essential that a comprehensive solution to this problem resolve the issues that are facing this country.

Specifically, about the stand-alone legislation, I know that there are a number of different varieties of stand-alone reliability legislation. We think the most critical or a few pieces that are very important are provisions that allow deference to the regions. Provisions that allow us the most flexibility to work in an international fashion with our partners in Mexico and in Canada, and others that will ensure that we have a streamline approach to ensuring reliability rules are mandatory.

The CHAIRMAN. I thank you very much. Let me take a couple more, but I would ask prior to that, two gentlemen on this side, you have been asked questions about investment, and so have you.

We have in the bill, you know, eliminated PUCA, which people like you and two generations of people that run the plants and operations have recommended that. And I just wanted to say, in addition to what our Senator from Missouri said, I would assume that something like the elimination of PUCA would be helpful in terms of getting the industry to have more resources. Is that a fair statement?

Mr. GENT. Senator, I serve a constituency that is all over the map on that, so NERC has no official position on that.

Mr. GLOTFELTY. Mr. Chairman, I just got back from spending 2 days in New York City meeting with investment banks with the Undersecretary of Energy. And time and time again, we heard that

call, that the repeal of PUCA is necessary to provide certainty for more investment in the transmission sector.

The CHAIRMAN. Mr. Harris.

Mr. HARRIS. As president and CEO of PJM, I'm kind of neutral to the question, but as a person professionally in the business for a long, long time, I do think it would be helpful.

The CHAIRMAN. Yes. Mr. Torgerson?

Mr. TORGERSON. Mr. Chairman, the Midwest ISO doesn't really have a position on it either, but as a former finance person, I understand that eliminating it would be helpful.

The CHAIRMAN. All right. Some say that what Congress has to do to protect reliability is to establish a national reliability organization, pass mandatory reliability standards. Do you think that that is needed to improve reliability? Do you think that that's the only thing that's needed to improve reliability? You have already kind of answered that question. You kind of favor that. You don't. How much?

Ms. MCCARREN. I agree with that statement that we need to get that legislation passed.

The CHAIRMAN. Alone?

Ms. MCCARREN. If that's the only way it can be moved then yes, alone.

The CHAIRMAN. Mr. Harris.

Mr. HARRIS. Well, I think what I have known specifically what is in the legislation, I think the points we are talking about with public oversight that is necessary with FERC authority to audit, with FERC authority over wholesale transmission throughout the nation. It's a broad, complete package and it would have to be looked at to make sure that it was total and complete.

The CHAIRMAN. Mr. Torgerson.

Mr. TORGERSON. Actually, I believe that the comprehensive legislation is important to be passed. I think having a transmission office in DOE is important. I think the sense of the Congress related to the RTOs is very important and also the clarification on the States to protect native load is important, along with reliability. And I think reliability is clearly something very important, too.

The CHAIRMAN. Okay. American electric power, I'm going to turn to that situation where they—American Electric Power's participation in PJM-RTO, what is the current status of the AEP and the PJM-RTO members, and is it important to the grid reliability that AEP join in this PJM-RTO. Who wants to take a shot at that? Mr. Harris?

Mr. HARRIS. Yes, sir, it's extraordinarily important from three particular perspectives. Number one, there was an agreement with AEP and the merger condition that had to do with joining an RTO. That was a public policy question and a decision after lengthy hearings. As was mentioned, there are five States that support AEP getting in right now to complete the merger conditions. In two States they are having hearings on it. That needs to be completed.

Secondly, the economics are huge. You look at close to a billion dollars savings from having AEP as part of a large regional market.

And then thirdly, if you look at the Eastern Interconnection and how the Eastern Interconnection operates. AEP is huge, it's the

largest transmission company. It's in the middle of the Eastern Interconnection and having that part of a functioning RTO will abate and help the overall—moving the electrical grid forward in the 21st century.

We are working at making arrangements with TVA so that they can participate without abridging the TVA Act. All of that is integral to AEP being a functional part of the RTO. So we are almost at a stand still until this moves forward and it's very important.

The CHAIRMAN. Thank you very much. All right. I may follow up with one or two, but I doubt that. I yield now to Senator Bingaman.

Senator BINGAMAN. Thank you very much, Mr. Chairman. As I understand it, NERC has a requirement that utilities file reports of failure to comply with NERC reliability rules. And that with—file those reports with NERC. And now FERC has come along and said they want copies of those reports as well. Am I right about that?

Mr. GENT. That's broadly correct.

Senator BINGAMAN. Okay. Do you want to refine it for me?

Mr. GENT. Each Regional Council, each has their own compliance programs and when they uncover violations, it goes into a regional report. And then it's generalized back to the NERC board.

What we are going to do in these resolutions is to make sure that every single violation gets reported in its full glory to the NERC board. We are working now to come up with a way to disclose that to the FERC in its proper context. I think you can see that if they just received every violation they wouldn't know how to put the significance on one versus another.

So we are—we hope to have within a month and a half a written policy that FERC can agree to as well that will allow us to pass that information on.

Senator BINGAMAN. FERC has taken some action, has it not, to require that these reports be filed with them?

Mr. GENT. They have only suggested that that would be a rule making, but to date, they have not done that.

Senator BINGAMAN. Let me ask Mr. Glotfelty. Do you agree that it makes sense that those reports, reports of failures in some form need to be filed with FERC?

Mr. GLOTFELTY. I think the most important thing is that they be made public at the right point in time. The companies that have violations ought to have the ability to go and discuss and determine if there really is a violation and then compare its magnitude to another's. But at some point in time if FERC is the appropriate entity where they would be filed so that there is some sort of public access, then that would be fine.

Senator BINGAMAN. I guess what has always concerned me about this whole issue of blackouts is when a blackout occurs, those of us who are supposed to be exercising some kind of oversight role of the Federal agencies, we need to know, who do you call in to a committee hearing and say why did this blackout occur and how are you going to get it fixed?

I have always thought FERC was the appropriate agency for us, at some stage at least, to be able to call in and say why did we have a blackout here. That's your job to head this off.

They have a pretty good answer right now, which is it's not their job. They don't have the authority. NERC has got a pretty good answer, because NERC has no authority to enforce its rules. Everyone has got a pretty good answer as to why it's not their problem except the ISO operators, I guess.

I guess, Mr. Torgerson, you are the one guy who sort of, the buck stops with you when a blackout occurs in your, in your region, your area, and you are the one that we need to look to to explain why the problem happened and how you are going to avoid it in the future. Is that the way you see the structure right now?

Mr. TORGERSON. I think—yes. The way we see the structure it's now become our responsibility to make sure we have the tools in place, follow the NERC standards, follow the rules that FERC has for us, and to monitor the system. And in the event that there are potentials for outages that could occur, we need to make sure we step in and stop, try to stop those before they expand.

And the idea behind it is to run these contingency analyses that Mr. Harris talked about that allows us to look at things ahead of time.

Senator BINGAMAN. So you see the ultimate responsibility for avoiding blackouts in your area as being yours?

Mr. TORGERSON. We will work to do it. Keep in mind we don't switch the breakers. We are not the ones trimming the trees, taking care of the vegetation management. That's still within the control areas of the utilities. We oversee the flows on the system. NERC has the standards on those tree trimmings and they are trying to expand that. We don't go out and actually physically do those things. We monitor and make sure the system is in a stable state.

Senator BINGAMAN. Let me ask Mr. Harris if you see your role as also that sort of limited or conditioned, or your responsibility as conditioned in that same way, or do you think that as head of the PJM operation, you really do have the responsibility to be sure the trees are trimmed?

Mr. HARRIS. Well, the overall reliability stops with us. We have an independent board. A fiduciary obligation of the board of PJM is to ensure we operate a safe and reliable electrical grid. And if we see maintenance practices, we see things that are affected the operations of the market, we would be obligated to move on that.

Senator BINGAMAN. Ms. McCarren, let me ask you the same thing. You have a much more loose arrangement in the West. Does your Western Energy Coordinating Council feel that the buck stops with you if there is a blackout in your region?

Ms. MCCARREN. I think we have to step forward and take responsibility. And we have to, under the current tools we have, do the best we can with enforcement. We have a contractual arrangement in place.

With respect to vegetation management, we can certainly make improvements. We are working on those. With respect to our reliability coordinators which oversee or are above those control areas, we've got a lot of work to do. And it's a wakeup call what happened in the East. And yes, we have to step forward and take this responsibility. But it is a shared responsibility at this point with the control areas and the transmission owners and operators.

Senator BINGAMAN. There is, in the bill that we have pending in the Senate calendar now, language that casts great doubt on FERC's authority to require the participation of utilities and RTOs. From what I'm hearing, that would be ill-advised for us to limit FERC's authority to require that participation. Is that your view, Mr. Harris?

Mr. HARRIS. Yes, sir, it is. Let me just say, you know, I have operated all over this Nation, out West, South for over 30 years. And I have seen the value brought in through large regional organizations. You have got 4,000 different entities. Local needs to be met, regional differences need to be met, and umbrella organizations that have the responsibility and authority for reliability can do that. And it will add value.

Senator BINGAMAN. All right. I will stop with that.

Senator THOMPSON. Senator Schumer, you came a little late. Would you like to ask a question?

Senator SCHUMER. Yes. Thank you. I thank you, Mr. Chairman. I appreciate it. I just have one question of the panel, and it's for Mr. Glotfelty. It follows up on what the chairman, Chairman Domenici, had asked.

This is about superconductivity. You know, when I look at my area in New York City, our biggest problem is probably not new powerplants being built in upstate New York and the Hudson Valley, hydropower in Canada because we are going to need more power and I have been supportive of trying to do that, but it's rather transmission, getting the lines here, it's very crowded, it's hard to do. It holds things up.

Superconductivity seemed to be our manna from heaven. To produce lines that allow three times, eight times, even 10 times the amount of electricity to go through the same line is just a godsend, not only for New York but for any other crowded area that needs power.

So I had worked actually with Senator Domenici, he representing Los Alamos, I representing one of the companies, IGC in Schenectady that is interested in this. Energy, and you, frankly, have been very supportive of these roles. Now because of earmarking the amount of money allowed to superconductivity has gone way down—and I am told by the people at both Los Alamos and IGC, this is not just going to slow this down, but you know, they are on the verge of many different important breakthroughs in terms of research. This could end it. So it's really penny-wise and pound-foolish to slow this.

I spoke with Secretary Abraham. I don't know if he informed you of that, and said we have to find the money elsewhere and I was heartened to hear Senator Domenici say, "Go find the money." Can you elaborate on what we can do? I mean, to say your hands are tied, none of these earmarks came out of this. I realize it wasn't Energy's doing, but Congress', they weren't from me. To say that there is nothing to do here because other things not related to superconductivity were earmarked out of this fund just doesn't answer the question in terms of our large, large energy needs down the road when we have a breakthrough technology that could work.

So, could you elaborate a little more after hearing Senator Domenici say, I was told what he said. I was at another hearing,

you know, that, “go find the money.” Your handcuffs are off, or go do—what can we do to help make that happen? What can the Energy Department do to find it? I’m sure in the huge budget you have, this is, I think we are only looking for something, you know, in the range of 15 or \$20 million to restore that total fund back up to the \$48 million that it was last year.

What can we do here? Can you give us some ideas? We won’t pin you down, but I just want to make sure that you are going to turn over every rock.

Mr. GLOTFELTY. Let me assure you that we will. We in the administration are huge believers in the applicability, in the promise that superconductivity shows, not only in terms of transmission lines but other types of devices, motors, generators and other things that will save electricity, reduce environmental effects of producing electricity for decades to come.

This has been a challenging year with the discretion that we have been afforded in terms of our budget. The actual real reduction in terms of dollars from last year to this year is only about \$6 or \$7 million. It is a much greater decrease from the President’s request, which was \$47 million, to the \$32 million that they have actually been allocated this year.

I assure you as I have the chairman that we are trying to turn over every rock to put more dollars into this program. Your State is the beneficiary of two of the first deployments in Albany, as well as in Long Island.

Senator SCHUMER. Right.

Mr. GLOTFELTY. Where we would take superconducting tables and actually deploy them in the grid, and we do not want to delay those. We want those to go on as planned. I think this year we are going to have to get through, but I think in the future, it is incumbent upon Congress and the industry to help us achieve our success. Minimizing earmarks will allow to us get there.

Senator SCHUMER. Right. Let me just say in response to what you said, with the Chair’s indulgence, that I am told if we don’t get some money this year, finding it some way or other, it’s really going to slow progress dramatically in terms of the amount of money. Yes, it’s \$6 to \$10 million, but that’s in the total budget of about \$12 or \$13 million. And it really just, you know, you hire scientists. You hire workers. You fire them. You are not sure you are going to be able to get them back again.

Mr. GLOTFELTY. I agree with you. The effects delay implementation of many of the technologies.

Senator SCHUMER. All right. So are we going to try and look and find some money this year so maybe working with the chairman we can replenish you next year. You know, there must be some little pools of money that are not all going to be spent this year that were allocated?

Mr. GLOTFELTY. I would like to work with you and our budget staff and the Appropriations staff to see if we can do that.

Senator SCHUMER. Okay. I thank you. I appreciate that. Thank you, Mr. Chairman.

Senator THOMAS. Thank you, Senator. Let me ask one. You, I believe, led the investigation on the blackout and you are going to have a report soon.

Did the interim report or will the final report have any legal conclusions about the cause of the blackout?

Mr. GLOTFELTY. It will not. That is not our responsibility. That is a court's responsibility to draw legal conclusions.

Senator THOMAS. And I know it's hard to answer, but I guess I'd like to have some reaction. Do we have any agency, any group that you know of that's talking about the future for electric generation and transmission, talking about the capacity of transmission, whether it's new or increasing capacity, talking about the investment, who is going to be able to do that and how we do it, the best power source, are we going to continue to use gas, can we use coal, which requires more transmission.

Are we going to have regional RTOs tied together with an interstate national theme. About the ownership of transmission, the benefit—those who benefit ought to pay and avoids regional monopolies which we have a little bit of right now.

If those are some of the issues, do we have anyone dealing with those and where are we going to be in 10 or 15 years? Just anybody who feels like it. Let us have a little reaction.

Mr. HARRIS. Senator, your observation is correct. There is tremendous asymmetry. In my initial comments, I mentioned 4,000 different entities involved in generation, transmission and distribution of power in this nation. And it's huge and eclectic, and tremendous asymmetry between different parts of the regions that are moving at different paces.

And in the Mid-Atlantic region, we have a planning protocol but the States insist to address all of those questions, but it's only for the ones that are underneath our footprint. However, we do have a council among all of the RTOs which covers about 60 percent of the interconnection, Eastern Interconnection. And in that we are putting together a regional planning protocol to look at everything underneath our footprint collectively, and to be able to address these long run issues as an RTO collective planning process.

Senator THOMAS. So you would do it more on a regional basis?

Mr. HARRIS. And through our coordination with the other RTOs, we can share the data and come up with a plan to do it in that respect.

Senator THOMAS. I'm not aware of much coordination among the RTOs.

Mr. HARRIS. As I mentioned, Senator, there is a lot of asymmetry in the development. It is—let's take time to get everything operational.

Senator THOMAS. Yes.

Ms. MCCARREN. Senator, in the West, we are undertaking—undertaking to develop a very close relationship among three key players in terms of planning and looking at all the issues you have raised.

There is, as you may know, a group that was put together to look at the commercial side of all of these issues and that has an acronym. We also have a State regulator's group and we have the Western Governor's Association and we have the WECC.

We are undertaking right now a detailed analysis of how we can work a lot more effectively together to address exactly the issues that you've described.

Senator THOMAS. Okay. Thank you. Yes, sir.

Mr. TORGERSON. Senator, we have in the Midwest ISO the organization of MISO States which are the State commissioners from every State that's in the Midwest ISO that have formed a group that we work with on planning issues, particularly. But not only planning but resource adequacy, generation adequacy within all—the entire area.

And we've worked directly with them now where they provide not only input but help us come to decisions on things like—beyond participant funding, or how do we define who the beneficiaries are and what cost mechanism could be put in place and this is being done in conjunction with all these State commissioners.

We also have a joint operating agreement with Mr. Harris' firm, PJM. And part of that requires a joint planning activity between the two of them, our stakeholders from both our groups so we can start planning a longer term not just within our own areas but across the Midwest ISO and PJM.

Senator THOMAS. Good. Yes, sir.

Mr. GLOTFELTY. Senator, my comments surround a process that we undertook as we were creating DOE's Office of Transmission and Distribution. We had two meetings that were attended by about 300 to 350 folks from the industry from consumers, consumer groups, environmental groups, municipals and co-ops as well.

And we undertook an exercise to try to see what the grid and create a vision for what the grid might look like in 2030. And we created a document called Grid 2030, a subsequent document was a road map which systematically addressed the barriers that need to be broken down to achieve that vision. And I will be happy to get it to you and your staff if—

Senator THOMAS. Thank you very much.

Mr. Gent.

Mr. GENT. Senator Thomas, it sounds like you are forming the scope of the Department of Energy or one of the charges that I would hope that our U.S. Government would undertake. All of these issues are vital to the Nation and I think that Mr. Glotfelty has many of these issues on his platter.

I would look for there to be a national solution first, and then a regional solution.

Senator THOMAS. I agree. And then I do think probably the Department has the responsibility to bring it together, but I don't want to be based on governmental decisions only. This ought to have private sector, both consumer/provider input and I'm sure that it will.

Well, thank you all very much for being here. I hope that we can result in an energy bill that will help on this so much. If anyone has further questions on the committee within the next 24 hours, you may get some questions. So very well. Committee is adjourned. Thank you.

[Whereupon, at 11:45 a.m., the hearing was adjourned.]



## APPENDIX

### RESPONSES TO ADDITIONAL QUESTIONS

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MIDWEST INDEPENDENT TRANSMISSION SYSTEM OPERATOR, INC.,  
*Carmel, IN, March 11, 2004.*

Hon. PETE V. DOMENICI,  
*Chairman, Senate Committee on Energy and Natural Resources, Dirksen Senate Office Building, Washington, DC.*

DEAR CHAIRMAN DOMENICI: Thank you for the opportunity to testify before your committee at its February 24, 2004 hearing concerning the recommendations made by the North American Electric Reliability Council ("NERC") in its report on the August 14, 2003 blackout. Set out below please find my responses to the follow-up questions contained in your letter to me of February 27, 2004.

#### RESPONSES TO QUESTIONS FROM SENATOR DOMENICI

*Question 1.* What steps has MISO taken after August 14 to ensure greater grid reliability?

Answer. Prior to August 14, the Midwest ISO was in the process of upgrading and enhancing a variety of tools used to insure reliability. The blackout prompted an acceleration and expansion of these efforts. As described in more detail in the written testimony already submitted to the Committee, these steps include the following:

- Reliability Tools. As of December 31, 2003 our State Estimator has served as our main reliability tool. This comprehensive state-of-the-art computer system allows us to gather real time information on the status of our system and our neighboring systems. We have also expanded our capabilities to run contingencies on our system so that we have already modeled impacts on the grid if certain problems arise. We have implemented software updates that allow us to sort the data that we receive with more emphasis on the information with the greatest potential for negative impact on the grid. Finally, we have developed a backup system in case of problems with any of our primary systems.
- Visualization Tools. We have improved our capacity to allow visualization of the status of the grid by employees of the Midwest ISO. We have more than doubled our video display areas and have increased our ability to see the grid on a wider basis and to visualize in great detail any identified problems.
- Training. We have participated in Emergency Drills and are instituting a series of additional drills and training that will be in place by June 30, 2004.
- Communications. We have worked with our members to clearly identify communication protocols in time of system emergencies. We have also increased communication of detailed information with entities not members of the Midwest ISO and we utilize the NERC system to communicate with other Reliability Coordinators.
- Operating Agreements. The Midwest ISO has developed a Reliability Charter with our members to specifically delineate roles and responsibilities. We have also developed a detailed joint operating agreement with PJM to specifically delineate the necessary coordination at our intertwined seam in the Midwest.

I should also point out that the Midwest ISO will meet or exceed all of the recommendations concerning our organization contained in NERC's report on the August 14 blackout.

*Question 2.* How do you think the companies in your region will react to NERC's data collection? What will you do to ensure full cooperation?

Answer. All of the companies in our region continue to hold reliability as the highest priority. As such, I believe that the companies in our region will fully comply with NERC's new data collection requests and the Midwest ISO will provide the necessary information and assistance to encourage them to do so.

*Question 3.* The East Central Area Coordination Agreement contains a large number of control areas, most of them rather small compared to other regions of the country. Do you think this contributed to the communication failures of the August 14 blackout? Should reliability coordinators be more centralized—that is big, not small—so they can be well-equipped to deal with the coordination of the grid?

Answer. The Midwest ISO believes that greater coordination among fewer areas will allow for more effective communications. On August 14, we believe the inability to accurately confirm the status of the grid, rather than the number of control areas in the East Central Area, most contributed to communication failures.

The Midwest ISO has developed a Reliability Charter for all entities in our organization including those that participate in the East Central Area Coordination Agreement to clearly delineate specific roles and responsibilities in meeting our reliability goals. We will continue to work to insure the proper configuration of Control Areas. As noted in more detail in my testimony previously presented to the Committee, the Midwest ISO is now well equipped to deal with the coordination of the grid.

*Question 4.* What are your thoughts on the application of a contractual compliance model in your regions?

Answer. The Midwest ISO has not pursued a contractual compliance model with our members and I do not know if they would be willing to enter into such contracts. We believe the steps taken to improve reliability, as outlined in my testimony and in the answer to Question 1 set out above, are the preferred methods to achieve this goal. As I also stated in my testimony, I believe the enactment of the enforceable reliability provisions contained in the Conference Report on H.R. 6 and in S. 2095 would go a long way to provide a more reliable bulk power system.

*Question 5.* Do you think that companies in your region like First Energy were disproportionately blamed for the August 14 blackout?

Answer. There is a legitimate public interest in determining the causes of the blackout of August 14 which resulted in disruptions and inconveniences for so many people. The event started in Northeast Ohio and the exact reasons why it spread so rapidly are still unknown. On the afternoon of August 14, the Midwest ISO was providing real time information to the Federal Government. It is possible that in giving the Government correct real time information that highlighted problems in First Energy's territory, we attracted scrutiny to their operations.

#### RESPONSES TO QUESTIONS FROM SENATOR CAMPBELL

*Question 1.* Is another catastrophe such as we saw last summer likely to happen again without the intervention of Congress? And, if so, what is needed from Congress legislatively to ensure that the blackout that struck the Northeast and Midwest last summer is not repeated in other areas of the country?

Answer. It is not realistic to totally eliminate any possibility of future blackouts but I believe the steps various Regional Transmission Organizations, NERC, individual companies along with Federal and State governments have undertaken will significantly reduce the likelihood of a reoccurrence and limit the extent of the problems caused by any reoccurrence. In terms of steps Congress could take to help avoid a recurrence of a large scale blackout, I would reiterate from my testimony already submitted to the Committee that the enactment of the electricity title of the pending energy bill would be a major step forward in providing a more updated and reliable transmission grid.

*Question 2.* I certainly don't want my home state of Colorado's resources and consumers hit by these problems. Are certain regions of the country just more susceptible to blackouts, or do you think this sort of scenario is possible anywhere in the United States?

Answer. Blackouts have occurred in different sets of circumstances since the 1960s, usually for different reasons each time, so it is difficult to say whether blackouts are more likely in any particular part of the country. However, the outages in the Western interconnect in the 1990s and the outage last summer each involved transmission lines coming into contact with trees. Vegetation management reviews across the country have been recommended by NERC to address this potential cause.

*Question 3.* What specific authorities does NERC (North American Reliability Council) lack that contributed to the collapse of the Eastern power grid?

Answer. The adoption of binding reliability standards by an electric reliability organization supervised by the FERC would fill an important gap in NERC's current authority. Mandatory reliability rules if adopted, and consistently interpreted and enforced will decrease the likelihood of another outage.

*Question 4.* What costs, particularly to private consumers, might be associated with your proposed changes?

Answer. The Midwest ISO has not quantified the costs of implementing the suggestions in the answer to question 3. However, the suggestions made would involve incremental work for NERC and the FERC. They would not require the creation of new institutions.

#### RESPONSES TO QUESTIONS FROM SENATOR LANDRIEU

*Question 1.* Since your respective organizations are responsible for short-term reliability and interregional coordination, what have your organizations done to date to prevent similar events that occurred on August 14 from re-occurring?

Answer. The Midwest ISO has taken actions unique to itself and worked jointly with PJM on other arrangements as explained below. Prior to August 14, the Midwest ISO was in the process of upgrading and enhancing a variety of tools used to insure reliability. The blackout prompted an acceleration and expansion of these efforts. As described in more detail in the written testimony already submitted to the Committee, these steps include the following:

- Reliability. As of December 31, 2003 our State Estimator has served as our main reliability tool. This comprehensive state-of-the-art computer system allows us to gather real time information on the status of our system and our neighboring systems. We have also expanded our capabilities to run contingencies on our system so that we have already modeled impacts on the grid if certain problems arise. We have implemented software updates that allow us to sort the data that we receive with more emphasis on the information with the greatest potential for negative impact on the grid. Finally, we have developed a backup system in case of problems with any of our primary systems.
- Visualization Tools. We have improved our capacity to allow visualization of the status of the grid by employees of the Midwest ISO. We have more than doubled our video display areas and have increased our ability to see the grid on a wider basis and to visualize in great detail any identified problems.
- Training. We have participated in Emergency Drills and are instituting a series of additional drills and training that will be in place by June 30, 2004.
- Communications. We have worked with our members to clearly identify communication protocols in time of system emergencies. We have also increased communication of detailed information with entities not members of the Midwest ISO and we utilize the NERC system to communicate with other Reliability Coordinators.
- Operating Agreements. The Midwest ISO has developed a Reliability Charter with our members to specifically delineate roles and responsibilities. We have also developed a detailed joint operating agreement with PJM to specifically delineate the necessary coordination at our intertwined seam in the Midwest.

I should also point out that the Midwest ISO will meet or exceed all of the recommendations concerning our organization contained in NERC's report on the August 14 blackout.

*Question 2.* Mr. Torgerson, can you provide a rough estimate for the following: (1) to date, total administrative costs for MISO; (2) the number of committees that have been formed under the organization, including stakeholder committees; (3) the number of ongoing FERC proceedings that the MISO is engaged in, and (4) the number of different technical systems required to operate the MISO on a daily basis?

Answer. (1) MISO Administrative Costs—The Midwest ISO's costs of operations have sometimes been referred to in shorthand as the MISO's "administrative costs." The MISO provides reliability services, transmission tariff services, system planning and billing, settlements and revenue distribution services as its core functions. It performs certain services as a contractor to MAPP COR for companies that are not MISO members located in the MAPP region. Those services are paid for at cost. The MISO's reliability coordinator coverage and its tariff area cover parts of 15 states and the province of Manitoba. The Midwest ISO provides transmission service to 164 tariff transmission customers. The Midwest ISO's costs for providing these services are recovered pursuant to a component of its tariff on file with the FERC, Schedule 10. Pursuant to this Schedule 10, the MISO has charged to and recovered from its customers approximately \$74 million in 2002 (at an average rate of \$0.130 per MWh), and \$68 million in 2003 (at an average rate of \$0.113 per MWh).

A greater level of detail about MISO's financial position, including its costs of operation, is included in the Company's audited financial statements, copies of which

accompany my response.\* I would note that the Midwest ISO agreed as part of a settlement agreement with its transmission owning members to defer recovery of \$25 million of costs incurred in 2003 until 2008. The other major cost we are not recovering currently is the expense of preparing to initiate the day 2 congestion management, energy markets and financial transmission rights program.

(2) MISO Committees—When MISO was formed through the voluntary action of certain transmission owners in the Midwest, the founding members submitted a governance structure that had been developed with stakeholder input that insured the Midwest ISO would be independent of the transmission owners and likewise of any market participant. Mindful that the new organization could benefit from the views of the transmission owners and other stakeholders who contributed to the development of the MISO, five different committees were called for in the Company's organic documents. They are as follows:

- The Advisory Committee
- The Transmission Owners Committee
- The Planning Advisory Committee
- The Alternate Dispute Resolution Committee
- The Nominating Committee

The duties of each of these organizations appears in the Midwest ISO Agreement and the Company's By-laws. In their respective spheres these Committees provide a regular, formal manner for the MISO and its Board of Directors to get the considered advice of its members and stakeholders on issues important to the MISO's development and customer service.

The Board of Directors has four committees, three of which have only Board members as participants and the fourth, the Nominating Committee, has two representatives from the Advisory Committee along with three Directors of the Board. The other committees are: the Finance and Audit Committee, the Human Resources Committee and the Markets Committee.

The Advisory Committee has four subcommittees underneath it and more than 25 working groups or task forces. The Transmission Owners committee has three working groups that report to it. These groups cover technical issues as well as policy developments.

(3) FERC Proceedings—The MISO is a party to 53 proceedings at the FERC that are still ongoing. I have left in the ongoing category any docket that a final order has not been issued in or where the time for rehearing has not yet run, or if requested has not been acted on by the Commission. These include 44 "ER" or Electric Rate Dockets and various "EL" or Electric Litigation dockets and one "EC" or Electric-corporate docket. As of March 2, 2004, the Midwest ISO had made 17 individual filings to FERC so far this calendar year.

(4) MISO Technical Systems—The MISO depends on about 69 different technical systems to conduct its business on a daily basis. While, I am sure my engineers could subdivide each of them further, I think grouping the systems upon which the MISO depends into four areas might help in understanding them.

The Midwest ISO relies on three major technical systems to operate on a daily basis: the "EMS"; the billing and settlements system, and its communications system. Each has components or subsystems as well.

The "EMS" or Energy Management System is the focus for MISO's basic core operations. It includes eight tools or computer programs systems that address the state of the grid. The systems that the reliability coordinators use to perform their functions are in this group and include: the State Estimator, which has an accompanying contingency analysis tool, the alarming tool, load forecasting, outage coordination and unit commitment. There are also three systems that the engineers use off-line for planning studies that relate to both the commercial uses of the system and reliability matters. To let our customers interact with us to purchase, reserve and schedule transmission service, the MISO operates an Open Access Same Time Information System ("OASIS") site. The processes are then grouped in technical systems for OASIS automation, and electronic and physical scheduling. These systems are relied upon on a daily basis. Two additional technical systems archive the data generated from the applications I have just listed.

The settlements system (for billing, invoicing and disbursement of revenue to the transmission owners) runs from three technical systems. This is a key part of our business; however, it is relied upon mostly at specific times of the month, e.g., 2 days after month end, 5 days after month end.

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\*The financial statements have been retained in committee files.

Portions of the MISO's communications system link the MISO to the outside world, MISO operations to one another and MISO employees to one another and the outside world. Eleven technical systems are involved in performing these functions.

The remainder of the technical systems are often remote from or even hidden from external view. They allow for development of WEB applications, corporate financial systems, basic desktop functions, computer network tools and applications, data base systems, server platforms and the cyber security systems related to virus protection, intrusion detection and digital certification.

These systems are mirrored, duplicated for redundancy purposes or have alternative capabilities in our back-up center.

Once again, thank you for the opportunity to provide this information to the Committee. If I can do anything to assist you in your tireless efforts to enact comprehensive energy legislation, please feel free to contact me.

Sincerely,

JAMES P. TORGERSON,  
*President and CEO.*

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WESTERN ELECTRICITY COORDINATING COUNCIL,  
*Salt Lake City, UT, March 5, 2004.*

Hon. PETE V. DOMENICI,  
*Chair, Senate Committee on Energy and Natural Resources, Hart Office Building, Washington, DC.*

DEAR SENATOR DOMENICI: Attached are WECC's responses to questions submitted by you and Senator Campbell after the February 24, 2004 Senate hearing. Thank you for the opportunity to clarify these issues.

Please feel free to call me if you have any additional questions.

Sincerely,

LOUISE MCCARREN,  
*Chief Executive Officer.*

[Attachments]

#### RESPONSES TO QUESTIONS FROM SENATOR DOMENICI

*Question 1.* Your testimony has indicated that the Western Interconnection should be treated almost as its own Electric Reliability Organization and the legislation provides for such delegation and deference. Why is this structure essential for the Western Interconnection?

Answer. The Western Electricity Coordinating Council ("WECC") has advocated, and continues to support, three important provisions in federal legislation.

1.1.1. Electric Reliability Organization ("ERO") delegation authority to a conforming regional entity for proposing and enforcing reliability standards.

1.1.2. A "Deference clause" under which the ERO must presume, subject to rebuttal, that a proposal from a regional entity that is organized on an Interconnection-wide basis encompassing its entire Interconnection is just, reasonable, and not unduly discriminatory or preferential and in the public interest.

1.1.3. The creation of Regional Advisory Bodies to ensure an appropriate role for states and provinces in the reliability assurance process.

This structure is essential because it provides for continent-wide standards to ensure appropriate outcomes, while recognizing individual differences to achieve those outcomes. It provides appropriate federal oversight while allowing management, implementation, and administration at a more local level. Significant regional differences should preclude a "one-size-fits-all" approach. Standards that are achievable by all entities within the nation may be less stringent than could be applied to, and are appropriate for, smaller regions. Further, the intent for regional flexibility and deference is to ensure that existing criteria that meet or exceed these national standards are preserved. For example: some Canadian entities have signed the WECC Reliability Management System Agreements, obligating them to pay sanctions for noncompliance if it occurs. National legislation, without similar Canadian and Provincial actions, will not provide similar results for these entities. However, as part of the Western Interconnection, these entities have a dramatic affect on its performance. Therefore, WECC is advocating for a structure that will preserve these benefits, while providing for national standards that must be met or exceeded.

Further, providing this flexibility for an Interconnection poses little risk. The lack of alternating current connections with other regions, which defines regions such as

the Western Interconnection and the Electric Reliability Council of Texas ("ERCOT"), virtually eliminates the ability for problems in one region to propagate into another. As previously mentioned, each Interconnection may have specific circumstances that require special criteria or consideration. For example: the Western Interconnection must recognize the special concerns associated with large load centers connected by limited transmission and supplied by generation located at great distance from this load. This situation is unlike that found in much of the Eastern Interconnection and requires special consideration to ensure reliable operation. Therefore, WECC must maintain the ability to develop criteria that meets or exceeds national standards while addressing legitimate differences found here.

As a member of the North American Electric Reliability Council ("NERC"), WECC has contributed to the laudable goal of common continent-wide standards. However, the Western Interconnection is distinct from the Eastern Interconnection and ERCOT, and our peer reliability organizations have recognized this, and accepted modifications to some standards and procedures. As such, the pending legislation correctly recognizes that the Western Interconnection must have an important role in the development of reliability standards for the West.

*Question 2.* I am interested in the contractual compliance aspects of the WECC. How detailed are the requirements in these contracts and how closely do they match NERC's rules? What kinds of penalties exist?

Answer. The WECC's Reliability Management System ("RMS") derives its sanctioning authority from the Western Electricity Coordinating Council Reliability Criteria Agreement (RMS Agreement). This is a contractual agreement among participants, signed by all participating in the RMS program. The document is available from the WECC website ([www.wecc.biz](http://www.wecc.biz)) at the following link: <http://www.wecc.biz/committees/JGC/CPTF/RMS/documents/index.html>.

Annex A of the RMS Agreement describes in detail each compliance criterion, and what is required for compliance. Development of the RMS criteria began with NERC policies and WECC criteria. Refinements were made to the RMS criteria during an evaluation process to verify that each criterion is clear, measurable, and enhances reliability. Some RMS criteria match NERC's standards (e.g. control performance standards 1 and 2) very closely. Other standards (e.g. operating reserve) are not in the NERC standards, but closely match WECC criteria. All RMS criteria are as restrictive as or more restrictive than the NERC standards. Compliance with RMS criteria demonstrates that an entity has complied with similar NERC standards.

Sanctions for violating RMS criteria range from a letter to the Chief Executive Officer for the least severe violation to a letter and monetary sanctions for the most severe incidents. Monetary sanctions are increased for repeat incidents of non-compliance during a particular compliance period (e.g. a month or quarter) and for repeat periods of noncompliance. The sanction for noncompliance with the disturbance control standard includes an increase in operating reserves rather than a monetary sanction. The amount of a sanction varies depending on the size of the entity that violated the criterion and the type of violation. Monetary sanctions have ranged from a thousand dollars to more than several hundred thousand dollars. However, this range does not represent the maximum dollar sanction that could occur.

*Question 3.* Your written testimony indicates that a high percentage of the WECC control areas are members of Reliability Management System. Are there any large transmission owners that are not members and how do you deal with the lack of participation of all non-members?

Answer. WECC members that are in the generation, transmission, distribution, or trading of electricity or the provision of related energy services in the Western Interconnection must belong to member class 1, 2, or 3. Class 1 members own, control or operate more than 1,000 circuit miles of transmission lines of 115 kV and higher within the Western Interconnection. Class 2 members own, control, or operate transmission or distribution lines, but not more than 1,000 circuit miles of transmission lines of 115 kV or greater, within the Western Interconnection. Class 3 members do not own, control or operate transmission or distribution lines in the Western Interconnection. This class includes power marketers, independent power producers, load-serving entities and any other Entity whose primary business is the provision of energy services. WECC offers the following response within this context.

There are six of WECC's 27 Class 1 members that are not signatories to the RMS Agreement. Three of these Class 1 members are control areas. In addition, while twenty-three of thirty-three WECC control areas are voluntary RMS participants, accounting for approximately 88 percent of the load and 81 percent of the generation in the WECC region, one control area operator is not a WECC member and is not an RMS signatory. However, the WECC staff continues to work with control areas and others who are not RMS participants to encourage their participation.

Regardless, all entities that are not RMS signatories submit RMS data in accordance with a Board policy adopted in August 1999. The Board took the following actions with respect to the RMS and members that have not signed the RMS agreements.

- WECC will continue the collection of RMS data from those members that have not signed the RMS agreements.
- WECC will continue to send late-data notices on a routine basis to those members that have not provided the requested RMS data within the requested time.
- WECC will continue sending noncompliance notification letters to member organizations that experienced noncompliance with respect to one or more of the RMS requirements. The noncompliance notifications include a summary of the number and severity of noncompliant events, and provide the dollar amount of sanctions that would have been assessed if the RMS were officially in place and the noncompliant organization had signed the RMS agreements.

The Board policy permits an entity to request that the RMS noncompliance notification letters be discontinued when those noncompliant members that have not signed the RMS agreements and have requested in writing that they not receive the noncompliance notifications. To date, four Control Areas and two other entities have exercised this option and requested discontinuance of RMS noncompliance notification letters.

When considering the RMS it is critically important to involve and include generators and marketers as well. Further, while achieving these RMS contractual commitments is difficult, the RMS agreements are enforceable in both Canada and Mexico, once signed.

*Question 4.* Please describe your vegetation management program and do you believe it can serve as a nationwide model?

Answer. WECC has three different processes in place to monitor an organization's vegetation management program. The processes are:

4.1.1. Annual certification through the RMS that owners of transmission facilities are performing vegetation management for the 40 major transmission paths (transmission paths which are identified as being most significant for reliability in the Western Interconnection). Each path owner(s) certifies that:

- It has a vegetation management program in its Transmission Maintenance and Inspection Plan ("TMIP");
- It performs vegetation management in accordance with its TMIP; and
- It has records of its vegetation management maintenance activities.

The WECC staff audits the RMS Participant's TMIP, maintenance and inspection practices, and maintenance records for the reasons listed below.

- A disturbance report identifies maintenance and inspection activities as a contributing factor in the disturbance;
- A recommendation by a Compliance Monitoring Work Group ("CMWG") team;
- Incomplete annual certification; and
- Random audit.

Failure to comply with the RMS criterion results in a letter sanction and possibly monetary sanctions.

4.1.2. A survey is conducted after each calendar quarter that requires each owner of transmission lines 230 kV and above to report the number of outages caused by vegetation. This survey brings visibility that vegetation management is important. Transmission owners are expected to improve their vegetation management program when the number of vegetation management related outages increase.

4.1.3. CMWG teams review the operating practices for each member including vegetation management. Control area operators are reviewed once every three years. Other WECC members are reviewed once every five years. If compliance with vegetation management criteria is identified as a problem, the review team can recommend that the WECC staff perform an RMS audit to determine if the RMS transmission maintenance criterion has been violated.

The WECC program may serve as a template for a nationwide model. However, WECC intends to evaluate current efforts after thoroughly reviewing the August 14 event, with the intent of improving our current processes.

*Question 5.* If Congress continues to be unable to pass comprehensive energy legislation that includes mandatory reliability rules, do you think that control areas in other parts of the country should follow the WECC contractual compliance model?

Answer. The WECC RMS is a significant achievement and it works well when “most” or all entities within an interconnection participate. It has the advantage of being enforceable with entities operating outside the United States. However, it can be difficult to implement contracts because there are limited incentives for entities to participate. The lack of 100% participation by entities within the Western Interconnection, considering the considerable efforts of the WECC and its predecessor the Western Systems Coordinating Council, underscores this issue. However, these limitations notwithstanding, the RMS is an unprecedented success. It could be used in other regions with appropriate modifications to meet regional circumstances, presuming entities are willing to sign appropriate agreements.

#### RESPONSES TO QUESTIONS FROM SENATOR CAMPBELL

*Question 1.* Is another catastrophe such as we saw last summer likely to happen again without the intervention of Congress? And, if so, what is needed from Congress legislatively to ensure that the blackout that struck the Northeast and Midwest last summer is not repeated in other areas of the country?

Answer. Outages affecting the electric system are inevitable and we cannot ensure that outages will not be repeated in other areas of the country. Human error, equipment failure, and system operating conditions aggravated by adverse weather conditions are factors that can collectively result in widespread electric system outages. Operating policies and procedures are in place to reduce the likelihood of such occurrences and when they do occur, limit the geographic area affected and the duration of the outages. Compliance with reliability standards in planning, maintaining, and operating the electric system will significantly reduce the likelihood of outages like the one that occurred on August 14, 2003. Enactment of reliability legislation will provide needed support in enforcing compliance with reliability standards, (e.g. vegetation management, operator training and certification, analysis tools, etc.) further reducing the likelihood of such outages.

However, such legislation does not address fundamental physical infrastructure problems such as the extreme difficulty in getting transmission additions permitted and sited, financial incentives for the construction of transmission additions, difficulties with State and Federal land management agencies concerning vegetation management and difficulties siting new facilities, etc. The current emphasis in the U.S. for competitive wholesale markets requires long distance energy transactions. Increases in these transactions, plus normal load growth, cannot be accommodated without transmission system expansion.

*Question 2.* I certainly don’t want my home state of Colorado’s resources and consumers hit by these problems. Are certain regions of the country just more susceptible to blackouts, or do you think this sort of scenario is possible anywhere in the United States?

Answer. Electric system outages are possible anywhere in the United States, and as the previous response suggests, this risk cannot be eliminated entirely. However, the enactment of reliability legislation will enhance enforcement of compliance with reliability standards, which can significantly reduce the likelihood, and geographic scope, of these outages. Considering the differences within the Western Interconnection compared to other interconnections that were previously mentioned, it is vitally important for this legislation to include the three important provisions currently in the proposed federal legislation of: delegation, deference, and a role for states and provinces.

*Question 3.* What specific authorities does NERC (North American Electric Reliability Council) lack that contributed to the collapse of the Eastern power grid?

Answer. WECC notes the following from NERC’s testimony to the Senate:  
 “Congress can take one very important step to ensure we do not have a repeat of August 14. That step is to pass reliability legislation to make reliability rules mandatory and enforceable for all owners, operators, and users of the bulk power system.”

*Question 4.* What costs, particularly to private consumers might be associated with your proposed changes?

Answer. As your question suggests, operating the electric system reliably requires entities to incur costs. However, as the August 14, 2003, event demonstrated, the costs of not operating reliably, are significant as well. WECC believes that compliance with existing standards is presently reflected in charges to consumers to the extent that entities have been successful in getting rates approved. A quantitative analysis of costs associated with modified criteria has not been performed, and cannot be performed before specific proposals are known, if then.

However, new standards that may be identified from the August 14, 2003, event analysis, must follow existing processes for development by WECC or NERC, respec-

tively. In general terms, both the WECC and NERC standards development processes provide open and meaningful consideration of costs and benefits by all affected parties, including consumer representatives. Said differently; new Policies, Procedures, Standards, etc. that may be proposed must show benefit exceeding costs, and consider concerns expressed by consumer representatives. Therefore, while these cost impacts have not been quantified, the development process being followed should allow for a full assessment and consideration of these costs.

Costs related to the addition of new facilities are even more difficult to estimate without specific proposals. Again, the processes that must be followed to receive approval to make these additions provides for identifying costs and allocating them using public processes, and in most cases, governmental oversight. These processes identify costs and provide discussion forums regarding those costs.

[The following are responses of Michehl R. Gent, president and CEO, North American Electric Reliability Council.]

#### RESPONSES TO QUESTIONS FROM SENATOR DOMENICI

*Question 1.* A number of the recommendations recently approved by the NERC Board involve compliance audits. How does NERC plan to improve the audit process to ensure reliability readiness?

Answer. NERC will institute a new readiness audit program for the reliability coordinators and control areas in North America. Previously such audits were done only for new control areas. Working with the regional reliability councils, NERC will audit all reliability coordinators and control areas in North America on a three-year cycle. Audits will include evaluation of reliability plans, procedures, processes, tools, personnel, and training. Audits will examine both written documentation and actual practices. Particular attention will be given to the deficiencies identified in the investigations of the August 14, 2003, blackout. The highest priority audits—of the largest control areas—will be completed by June 30, 2004. The reliability readiness audit process has already begun, with the completion of the first three site visits; other audits are scheduled on a regular basis. NERC will make the final audit reports available to regulators and the public to provide assurance that all responsible entities are capable of reliably operating the bulk electric system and that remediation plans are being implemented to address any deficiencies that are identified. FERC and other relevant regulatory agencies will be invited to participate in these audits.

*Question 2.* Under S. 2095's reliability provisions, FERC will play an important oversight role in assuring reliability. What is FERC's role today in NERC's efforts to strengthen the current voluntary reliability regime?

Answer. NERC will work closely with the Federal Energy Regulatory Commission to ensure compliance with reliability standards. FERC Chairman Patrick Wood attended the NERC Board of Trustees meeting on February 10, 2004, at which recommendations for strengthening the reliability of the bulk power grid were approved. The Chairman expressed his full support for NERC's actions to ensure that the existing system of voluntary compliance with reliability standards provides necessary protections for American electricity consumers. FERC has also announced its intention to provide vigilant oversight of NERC's efforts to implement the blackout recommendations. FERC representatives will participate in the reliability readiness audits already initiated by NERC and the regional reliability councils and will also participate in the effort to strengthen NERC's compliance templates, which are used by the NERC compliance program to measure the performance of operating entities under the reliability rules.

*Question 3.* NERC has said that it will be collecting information on violations of the voluntary rules. What will NERC do with this information and will FERC, or any other government agencies like the Department of Homeland Security, be involved in this data collection?

Answer. NERC is implementing a new system that will require each regional reliability council to report to the NERC Compliance Enforcement Program within one month of the occurrence all significant violations of NERC operating policies and planning standards and regional standards. These confidential reports will contain details regarding the nature and potential reliability impacts of alleged violations and the identities of involved parties. Once the results of the investigation of a significant violation are received, NERC will require an offending organization to correct the violation within a specified period of time. If an offending organization is non-responsive and continues to cause a risk to reliability, NERC may seek to remedy the violation by requesting the assistance of appropriate regulatory authorities.

NERC will also receive from the regional reliability councils quarterly reports of all violations of NERC and regional reliability rules on a non-public basis.

NERC intends to make the final results of investigations of significant compliance violations available to regulators and the public. NERC will also periodically provide aggregated reports of all violations to regulators and the public, with an indication of the nature and seriousness of the violations.

Much of the data that NERC will have access to is subject to confidentiality agreements. Some of the data contains market-sensitive information. Some of the data relates to critical energy infrastructure, and as such, cannot be made public without placing the system at greater risk. Notwithstanding these constraints, NERC recognizes the need to make appropriate information about the level of compliance available to regulators and the public, in order to regain the public's trust and provide assurance that preserving the reliability of the bulk electric system is of paramount importance to NERC and to the electric industry as a whole. NERC has convened a task force to develop disclosure guidelines. I would be happy to provide the results of that task force work to the committee. NERC is working directly with FERC to address how reported information on violations is to be shared with the Commission.

NERC works separately with the Department of Homeland Security (DHS) on critical infrastructure matters and serves as the electric sector coordinator and Information Sharing and Analysis Center. DHS will have access to information on violations where it is relevant to the protection of the electricity infrastructure.

*Question 4.* How does NERC plan on assuring implementation of its recommendations to enhance the reliability of the bulk power system that were recently approved by the NERC Board?

Answer. NERC is already in the process of implementing the board's recommendations that call for specific actions by NERC and the regional reliability councils. With respect to the near-term actions that FirstEnergy, PJM, and the Midwest Independent System Operator must take to remedy specific deficiencies before this summer, we have required the involved entities to certify to the board by no later than June 30, 2004, that the required remedial actions have been completed. Each organization is further required to present a detailed plan for completing the identified actions to the NERC committees for technical review on March 23-24, and to the NERC-board for approval—no later than April 2, 2004. NERC has assigned experts to help these companies develop plans that adequately address the issues identified in the recommendations, and for any other remedial actions for which they require technical assistance.

One NERC action item is to develop a tracking system to ensure that recommendations from investigation reports and audits are fully implemented. That system will include a regular reporting function to the board, the NERC stakeholder community, regulators, and the public on the progress being made to implement each of the recommendations.

*Question 5.* The systems affected by the August 14, 2003 blackout were members of one of three Regional Reliability Councils—the East Central Area Coordination Agreement, the Mid-Atlantic Area Council and the Northeast Power Coordinating Council. Is it correct that each of these councils has their own reliability standards? Are such individual reliability council rules generally more or less stringent than NERC rules? Whose rules take precedent—the council's or NERC's?

Answer. The East Central Area Coordination Agreement, the Mid-Atlantic Area Council, and the Northeast Power Coordinating Council have reliability standards that complement and implement the NERC standards, as do the other regional reliability councils. A region may also have a standard on a subject not covered by a NERC standard. Regional standards may be more stringent than, but may not be inconsistent with or less stringent than, the NERC standards. Both sets of rules apply, and operators must comply with the more stringent one.

*Question 6.* How does NERC interact with the states and with the regional transmission organizations?

Answer. NERC interacts with the states and with regional transmission organizations in a variety of ways. Representatives of states and the RTOs are active participants in the various committees that carry out NERC's work. Both states and RTOs have representation on the NERC Stakeholders Committee, which elects the Board of Trustees and provides advice to the board on policy matters. State representatives make up one of the nine voting segments in the NERC procedure for voting on new reliability rules. RTOs participate in another of the nine voting segments.

*Question 7.* The Congressional Budget Office estimates that spending by the electric reliability organization would total roughly \$1.1 billion between 2004-2013 and net revenues collected by the reliability organization would total \$820 million over

the same period. Do you agree with CBO's argument that the reliability organization's spending and revenues should be included in the federal budget?

Answer. No. First, Section 1211(b) of S. 2095 specifies that the electric reliability organization certified by FERC and any regional entity that is delegated enforcement authority are not "departments, agencies, or instrumentalities of the United States Government." Thus, it is unclear why any costs or revenues of the reliability organizations authorized by this legislation should be "scored" as revenues and costs of the federal government.

Second, these reliability organizations are funded by electric industry participants and ultimately by customers and users of electricity. The ERO will have the authority to assess its members for all of its costs, and it will not be seeking any money from Congress. Under proposed new Federal Power Act section 215(c)(2)(B), the ERO must "allocate equitably reasonable dues, fees, and other charges among end users for all activities under this section." Therefore, the ERO's revenues should fully cover the amounts spent by the organization.

As we understand it, it is only because the Congressional Budget Office uses a "lost taxes" methodology that there is any difference assumed for budgetary purposes between spending by the EERO and revenues received by the ERO. (As it has been explained to us, the "lost taxes" methodology assumes that the collection annually of the fees to fund the reliability organizations will reduce economic activity, resulting in a 25% "lost tax receipts" cost to the Federal government because of the collection of such fees.) While we are not in a position to effectively challenge the budget scorekeeping rules, their application in this instance appears to produce a result that is inconsistent with how the non-profit ERO actually will operate, and that fails to account for the benefits that will result to the economy from assuring the greatest possible reliability of the electric grid. Avoiding a cascading outage of the magnitude of the August 14 outage and the economic dislocation it caused (estimated to be between \$4 and \$10 billion for that single event) is surely a substantial benefit that must be weighed against any costs of maintaining the reliability organizations.

*Question 8.* What is NERC doing to involve these countries in implementing its recommendations to strengthen grid reliability?

Answer. As you are aware, the interconnected grid does not take account of international boundaries. The United States has extensive interconnections with Canada, and a significant amount of trade in electricity goes on between the two countries. The physical grid operates to a common set of rules, and Canadian and U.S. interests participate together in all of NERC's activities. Our interconnections with Mexico are much more limited (confined to Baja California Norte, Mexico and isolated connections along the Texas/Mexican border), but we expect that activity to grow over the years, and Mexican participation in NERC's activities to grow commensurately.

Three of the regional reliability councils—WECC, MAPP, and NPCC—include systems in both the United States and Canada. The NERC board recommendations stemming from the August blackout are equally applicable on both sides of the international border, and will be implemented throughout the NERC regions. The full integration of Canadian participation into NERC and the regional councils makes this possible.

*Question 9.* How will the ERO ensure that it will be an independent body that can act efficiently to deal with grid needs and potential violations?

Answer. The reliability legislation requires that the entity that is certified by FERC as the electric reliability organization must have the ability to develop and enforce reliability standards that provide for an adequate level of reliability of the bulk power system. Another requirement for certification is that the entity must have established rules that ensure its independence from the users, owners, and operators of the bulk power system, while also assuring fair stakeholder representation in the selection of the directors of the ERO and balanced decisionmaking in any ERO committee or subordinate organizational structure. The legislation also contemplates that the ERO will have a secure funding base to support its activities. These provisions have been carefully crafted to assure both that the ERO will be independent, and also that it will be able to carry out its specialized reliability functions efficiently through the use of established industry expertise.

#### RESPONSES TO QUESTIONS FROM SENATOR CAMPBELL

*Question 1.* Is another catastrophe such as we saw last summer likely to happen again without the intervention of Congress? And, if so, what is needed from Congress legislatively to ensure that the blackout that struck the Northeast and Midwest last summer is not repeated in other areas of the country?

Answer. Large-scale blackouts are possible when operators of the system do not follow the established rules. The most effective means to reduce the chances of another widespread outage like the August 2003 blackout is action by Congress to make reliability rules established by an ERO mandatory and enforceable for all users, owners, and operators of the bulk power grid. I believe that if the reliability legislation had been passed two years ago, we would not have had the August 14 blackout. The reliability language included in the conference version of H.R. 6, and also in S. 2095, enjoys widespread support from all parts of the industry, as well as customers and regulators. The August blackout underscores the urgent need for Congress to enact reliability legislation this year.

*Question 2.* I certainly don't want my home state of Colorado's resources and consumers hit by these problems. Are certain regions of the country just more susceptible to blackouts, or do you think this sort of scenario is possible anywhere in the United States?

Answer. The potential for disruptions to the bulk power grid exists in all regions of the country. Widespread grid outages are rare, but are possible if there are multiple failures in the system of reliability safeguards.

Both the current NERC reliability system and the reliability legislation acknowledge that regional differences may be reflected in reliability rules applicable within a given region. Under the current voluntary system, for example, the Western Electricity Coordinating Council (WECC) has established a voluntary, contract-based Reliability Management System, through which 23 control areas and 7 other transmission operators are contractually committed to comply with specific reliability criteria. The WECC Reliability Management System is designed specifically to address the needs and concerns of transmission users in the Western Interconnection. The system takes account of, and is often based on, NERC reliability criteria.

Recognizing that there may be unique regional needs, the reliability legislation provides for delegation and deference to regional entities organized on an Interconnection-wide basis. Specifically, the legislation provides that, in reviewing reliability standards, the Federal Energy Regulatory Commission shall give due weight to the technical expertise of a regional entity organized on an Interconnection-wide basis with respect to a reliability standard to be applicable within that Interconnection. The legislation further creates a rebuttable presumption that a proposal to the ERO from a regional entity organized on an Interconnection-wide basis for a reliability standard that would be applicable on an Interconnection-wide basis is just, reasonable, and not unduly discriminatory or preferential, and in the public interest. Under the legislation, the ERC would be authorized to delegate authority to a regional entity for the purpose of proposing reliability standards to the ERO and enforcing reliability standards if the entity satisfies certain requirements set forth in the legislation for its governance, ability, and organization.

*Question 3.* What specific authorities does NERC (North American Electric Reliability Council) lack that contributed to the collapse of the Eastern power grid?

Answer. NERC has conducted a comprehensive investigation of the August 14 blackout, and has contributed to the U.S.-Canada Power System Outage Task Force's November 19, 2003, Interim Report identifying the root causes of the outage. From our investigation, we have concluded that some entities violated NERC operating policies and planning standards. The lack of NERC authority to enforce compliance with the reliability rules meant that there was no effective deterrent to these violations that ultimately contributed directly to the start of the cascading blackout.

In addition to deterring violations through the possibility of sanctions, enforcement authority also is necessary to assure that the system is managed properly on a day-to-day basis. The blackout investigation revealed numerous failures in operations and communications practices. The existing process for monitoring and assuring compliance with NERC and regional reliability standards proved inadequate to identify and resolve specific compliance violations before those violations led to a cascading blackout. Deficiencies identified in investigations of prior large-scale blackouts in the areas of vegetation management, operator training, and use of tools to help operators better visualize system conditions were repeated. These are areas in which mandatory and enforceable rules could have made a substantial difference and where an enhanced enforcement process might have prevented the blackout from occurring.

*Question 4.* What costs, particularly to private consumers might be associated with your proposed changes?

Answer. The current voluntary reliability system is already funded by consumers, who pay approximately \$50 million annually for reliability to NERC and its regional council members. In contrast, estimates of the cost of the August 14 blackout range from \$4-\$10 billion. Put in this perspective, reasonable additional costs to con-

sumers for supplying a more robust and mandatory reliability system would be a far wiser investment than leaving the system vulnerable to the unexpected and often excessive costs associated with a major power disruption.

#### RESPONSE TO QUESTION FROM SENATOR BINGAMAN

*Question.* There are a number of class action suits against companies involved in the blackout. Does the report draw any conclusions as to the legal liability of the defendants in these actions?

*Answer.* Neither the interim report of the U.S.-Canada Task Force nor reports issued as the result of investigation of the blackout by NERC draw any conclusions regarding the legal liability of defendants in class action suits stemming from the August blackout. I would expect that conclusions as to legal liability would be the province of the court system.

#### RESPONSES TO QUESTIONS FROM SENATOR LANDRIEU

*Question 1.* It appears from your study that the deficiencies identified were not caused by insufficient transmission capacity in the affected areas, is that correct?

*Answer.* That is correct. Insufficient transmission capacity was not identified as a specific cause of the August 14 blackout. NERC identified the following failures as leading to the August blackout: 1) some entities violated NERC operating procedures and planning standards, and those violations contributed directly to the start of the cascading blackout; 2) the existing process for monitoring and assuring compliance with NERC and regional reliability standards was inadequate to identify and resolve specific compliance violations before those violations led to a cascading blackout; 3) reliability coordinators and control areas have adopted differing interpretations of the functions, responsibilities, authorities, and capabilities needed to operate a reliable power system; 4) problems identified in studies of prior large-scale blackouts were repeated, including deficiencies in vegetation management, operator training, and tools to help operators better visualize system conditions; 5) in some regions, data used to model loads and generators were inaccurate due to a lack of verification through benchmarking with actual system data and field testing; 6) planning studies, design assumptions, and facilities ratings were not consistently shared and were not subject to adequate peer review among operating entities and regions; and 7) available system protection technologies were not consistently applied to optimize the ability to slow or stop an uncontrolled cascading failure of the power system.

*Question 2.* Of the 530 plants that were involved in last summer's blackout how many had "black start" capabilities? What "black start" technologies are available to help plants get back online more quickly after a blackout? If some of the plants had "black start" capabilities to get them up and running would there have been a benefit for the other plants?

*Answer.* Restoring a system from a blackout is not just a question of restarting generating units. Restoration requires a very careful choreography of re-energizing transmission lines from generators that were still on-line inside the blacked-out area as well as from systems from outside the blacked-out area, restoring station power to the off-line generating units so that they can be restarted, synchronizing those generators to the Interconnection, and then constantly balancing generation and demand as additional units and additional customers are restored to service.

NERC requires that each operating entity have a black start plan along with a system restoration plan. The ability of the system operators to restore the grid and service to customer load was enhanced because the backbone 345 kV system in New York State remained energized and served by hydroelectric generation that remained on-line near the New York-Ontario border at Niagara Falls and St. Lawrence. The system operators used these generators plus the power that continued flowing from Hydro-Quebec to keep a part of the transmission system energized in northern New York, which provided the power needed to black start the off-line generators. This was a key to the overall restoration. Had that system not remained energized, operators would have called on the black start units that exist around the system.

There are several hundred diesel-generating units installed in the SCAR, MAAC, and NPCC regions. Most of these units range from fractions of a megawatt to several megawatts in size. Many, but not all, of these units are located at plants involved in last summer's blackout. Hydroelectric generating units also provide black start capability, as do many combustion turbines.

*Question 3.* If some of the plants had "black start" capabilities could other plants have been brought online more quickly because they could be powered up and more easily synchronized back into the grid?

Answer. The restoration process following the August 14, 2003, blackout went very well, and NERC and its regions are completing a detailed investigation of the restoration process. That investigation will include the procedures used to black start off-line generators, and should provide valuable information to help us determine if additional black start generation is needed.

*Question 4.* The black out caused the loss of tens of billions of dollars because manufacturing ceased. In addition, safety was endangered when sewage plants shut down and overflowed into rivers and gas ran low because refineries couldn't operate. Should these areas of critical infrastructure have their own capabilities to generate emergency power?

Answer. NERC's responsibility is to develop and enforce standards to provide for the reliable operation of the bulk electric system. While public health and safety are of vital concern, NERC does not address black start capability for manufacturing facilities, sewage facilities, refineries, or other customers. Such facilities are served from local distribution systems and will have service restored in conjunction with overall system restoration priorities. Critical facilities such as hospitals commonly have emergency generators for when they lose power from the grid. Other asset owners would be in the best position to judge the relative costs and benefits of installing or increasing their own capabilities to generate emergency power.

*Question 5.* Has NERC studied the idea of supplementing certain plants with mobile power generators that can be quickly moved from a plant where it supplies "black start" capabilities to the scene of natural disaster or terrorist attack to keep critical infrastructure running?

Answer. NERC has not studied that issue. The results of the study described in answer to question 3 above may provide some insight on this question.

DEPARTMENT OF ENERGY,  
CONGRESSIONAL AND INTERGOVERNMENTAL AFFAIRS,  
*Washington, DC, April 23, 2004.*

Hon. PETE V. DOMENICI,  
*Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.*

DEAR MR. CHAIRMAN: On February 24, 2004, Jimmy Glotfelty, Director, Office of Electric Transmission and Distribution, testified regarding the reliability of the Nation's electricity grid.

Enclosed are the answers to 22 questions that were submitted by you, Senators Campbell, Bingaman, Wyden and Landrieu to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

RICK A. DEARBORN,  
*Assistant Secretary.*

[Enclosures]

RESPONSES TO QUESTIONS FROM SENATOR DOMENICI

*Question 1.* Do you think that NERC's compliance audit plan is sufficient and will it be effective?

Answer. The compliance audit program is critical to effective monitoring and enforcement of reliability standards. It should be effective if the industry's funding for the North American Electric Reliability Council (NERC) and the regional councils is not dependent upon the companies subject to audit, if NERC and the regional councils make compliance audits a high priority, if NERC and the regions commit sufficient resources to the program, and if the teams are made up of experts from both within the industry and outside the industry.

*Question 2.* What is DOE's role in strengthening the reliability of the grid and what has been accomplished so far in making the grid more reliable?

Answer. DOE conducts R&D programs in critical areas related to grid reliability, provides analytic assistance to the Federal Energy Regulatory Commission (FERC), the States, and other organizations with an interest in reliability issues, and represents the Administration on grid-related questions. More specifically:

- We are developing a portfolio of technologies to enhance the reliability and efficiency of the grid. High temperature superconductivity, advanced conductors, electric storage, distributed intelligence/smart controls, and power electronics will form the building blocks of a modernized grid. This will be complemented by projects in demand response and distributed generation.

- We published the *National Transmission Grid Study* in May 2002, which identified a number of key transmission bottlenecks.
- We have provided assistance to the states in the West, the Midwest, and the Northeast in the development of regional organizations to facilitate regional solutions to transmission-related policy problems.
- We have played a critical role in the activities of the U.S.—Canada Power System Outage Task Force, and we will be actively involved in responding to the Task Force’s recommendations for preventing future blackouts and minimizing the scope of any that nonetheless occur.
- We have responded to the recommendations of the *National Energy Policy* that direct the Secretary of Energy “to work with the Federal Energy Regulatory Commission (FERC) to improve the reliability of the interstate transmission system and to develop legislation providing for enforcement by a self-regulatory organization subject to FERC oversight”, and also “to authorize the Western Area Power Administration to explore relieving the “Path 15” bottleneck through transmission expansion financed by non-federal contributions.” In these areas, we supported the enactment of legislation to make compliance with reliability standards mandatory and enforceable, and we also coordinated arrangements for a project to ease the Path 15 problem in California.

*Question 3.* Do you think that restructuring in the electricity industry contributed to the August 14 Blackout?

Answer. To date, the U.S.-Canada Power System Outage Task Force’s investigation, which DOE has coordinated on behalf of the Administration, has found no particular linkage between the restructuring of the industry and the blackout. The Task Force concluded in the interim Report it issued in November 2003 that the August 14, 2003, blackout was caused by:

- An insufficiency of reactive power resources in the Cleveland-Akron area;
- Inadequate situational awareness in FirstEnergy’s control room after its energy management system lost some critical functions;
- Inadequate management by FirstEnergy of electrical clearances for transmission lines in its right-of-way areas;
- Inadequate diagnostic assistance of FirstEnergy’s problems on August 14 by the Midwest Independent System Operator (MISO) and PJM Interconnection (PJM).

*Question 4.* The reliability provisions in the comprehensive energy bill obviously are critical to improving the reliability of the grid. The comprehensive energy bill also encourages greater investment in the transmission system through siting reform and pricing incentives. How important are these provisions to improving long-term grid reliability and you think there will be sufficient transmission capacity to meet demand?

Answer. The provisions relating to transmission siting and grid-related investments are extremely important for both the near term and the long term.

As for the sufficiency of transmission capacity to meet demand, the first impact of limited transmission capacity will be higher retail electricity prices, due to reduced capacity of wholesale electricity buyers to reach distant low-cost suppliers. In other words, reliability would still be maintained but consumers would see higher prices. Eventually, of course, it could become difficult to meet demand reliably even using all nearby and high cost suppliers. The current reliability problems in southeast Connecticut are a good example.

*Question 5.* I understand that grid reliability does not recognize international boundaries since both Canada and Mexico have transmission systems that are interconnected with our country’s grid. How would you describe the current efforts by the DOE, FERC, and NERC to deal with this international aspect of reliability?

Answer. The reliability of the North American electricity grid can be enhanced further through closer coordination and compatible regulatory and jurisdictional approaches. Each country needs to develop a mechanism for enforcing compliance with the standards by entities under its jurisdiction. Each country also needs to be confident that entities that are subject to the jurisdiction of a neighboring country will also be subject to compliance and enforcement requirements. NERC is a North American organization, and the reliability standards it develops are North American standards.

If the Electricity Reliability Organization (ERO) is created with the passing of the comprehensive energy legislation currently before Congress, then the ERO will be capable of dealing with the international aspect of reliability. The ERO will be the international organization that will address cross-border electricity flows and reliability.

## RESPONSES TO QUESTIONS FROM SENATOR CAMPBELL

*Question 1.* Is another catastrophe such as we saw last summer likely to happen again without the intervention of Congress? And, if so what is needed from Congress legislatively to ensure that the blackout that struck the Northeast and Midwest last summer is not repeated in other areas of the country?

Answer. The Task Force's Interim Report noted that many of the causes of the August 14, 2003, blackout are strikingly similar to causes of earlier blackouts in the U.S. We have reliability standards, but compliance with them needs to be mandatory and enforceable. It is critical that Congress make compliance with reliability standards mandatory and enforceable by passing comprehensive energy legislation that includes such reliability provisions.

*Question 2.* I certainly don't want my home state of Colorado's resources and consumers hit by these problems. Are certain regions of the country just more susceptible to blackouts, or do you think this sort of scenario is possible anywhere in the United States?

Answer. The U.S.-Canada Power System Outage Task Force Interim Report determined that the initiation of the August 14, 2003, blackout was caused by deficiencies in specific practices, equipment, and human decisions that coincided that afternoon. These factors include inadequate vegetation management; failure to ensure operation within secure limits; failure to identify emergency conditions and communicate that status to neighboring systems; inadequate operator training; and inadequate regional-scale visibility over the bulk power system. Although regions with frequent transmission congestion such as the Northeast may be at greater risk, this scenario is possible anywhere in the United States.

*Question 3.* What specific authorities does NERC (North American Reliability Council) lack that contributed to the collapse of the Eastern power grid?

Answer. NERC has no authority to enforce the standards that it presently develops or to assess penalties. Further, NERC is limited by its current legal status as a voluntary organization funded by its members. There is a need to establish a mechanism for funding NERC (or a future reliability Organization) and the regional reliability councils that is independent of the entities they oversee. Finally, NERC lacks authority to require all entities operating as part of the bulk power system to be members of the regional reliability council (or councils) for the regions in which they operate.

*Question 4.* What costs, particularly to private consumers might be associated with your proposed changes?

Answer. Prudent expenditures and investments to maintain or improve reliability would be recoverable through transmission rates, as they are today. The incremental expenditures and investments would be small in comparison to the cost of chronic or widespread blackouts.

## RESPONSE TO QUESTION FROM SENATOR BINGAMAN

*Question.* There are a number of class action suits against companies involved in the blackout. Does the report draw any conclusions as to the legal liability of the defendants in these actions?

Answer. The U.S.-Canada Power System Outage Task Force's mandate did not include reaching conclusions regarding legal liability of parties involved in the August 14, 2003, blackout.

## RESPONSES TO QUESTIONS FROM SENATOR WYDEN

*Question 1.* Are you familiar with the experiment of eliminating skilled operators at the "Flat Iron" facility in the Pacific Northwest region? Are you aware that there was a system failure which might have been prevented if full time operators had been present?

Answer. I am not familiar with this matter; the Office of Electric Transmission and Distribution does not monitor the operation of hydroelectric power facilities.

*Question 2.* Given this past experience, both on the East Coast and at the Flat Iron plant, wouldn't you agree that in many cases it pays to maintain trained operators on-site in the operation of electric power facilities?

Answer. "Trained" operators were involved during the August 14, 2003, blackout. However, the training was not adequate. Deficiencies in specific practices and human decisions contributed to the escalation of the problem. On-the-job training during daily operations is not sufficient to ensure reliability; emergency preparedness requires experience under realistic simulated emergency conditions. NERC recently recommended modifying personnel certification criteria to include emergency response training requirements and other qualifications necessary to assure reliable

operations. While having trained operators on-site is usually good, BPA and other organizations believe that remote operation can be consistent with sound business practices.

*Question 3.* If that is the case, then can you tell me why the Army Corps of Engineers and the Bureau of Reclamation have been pushing forward with proposals to “remote operate” many of the hydroelectric dams in the West?

*Answer.* Since neither the Task Force nor the Office of Electric Transmission and Distribution address the operation of the hydroelectric dams in the West, I am unable to comment on the rationale behind the Army Corps of Engineers (Corps) and Bureau of Reclamation’s (Reclamation) proposals. Questions regarding specific operational issues should be directed to the Corps and Reclamation directly since they are responsible for operating their respective hydroelectric projects in the West. However, I am informed by officials at the Bonneville Power Administration (Bonneville) who work jointly with the Corps and Reclamation in setting operating practices and performance expectations that several of the hydroelectric plants in the Northwest that Bonneville markets from are currently operated remotely and others are being considered for remote operation. I understand that Bonneville and its partners, the Corps and Reclamation, expect remote operation to be done in a manner that is consistent with industry practice and is compatible with contractual requirements as well as operational and reliability standards.

*Question 4.* Wouldn’t these proposals seem to directly ignore the lessons learned from the East Coast blackout and the Flat Iron incident?

*Answer.* The August 2003, blackout focused attention on the vulnerabilities of our Nation’s existing energy infrastructure. This and other events are proof that our increasingly complex and integrated world calls for a more responsive energy system. While maintaining reliability requires properly trained and skilled operators, it is also clear that the integration of advanced communications, control methods, and information technology is necessary to enable more effective use of electric system assets, optimized grid operations, and cost-effective economics.

*Question 5.* I understand that the Army Corps is considering a proposal to “remotely operate” the John Day Dam from The Dalles Dam. The plan includes using microwave communications towers, which require a continuous “line of sight”. If communications were interrupted for any reason, how long would it take for a senior operator to make it from the Dalles Dam to the John Day Dam to correct whatever operations errors might have occurred?

*Answer.* I am informed by Bonneville that the Corps’ John Day-The Dalles microwave system, scheduled to be operational later this fiscal year, will increase generation reliability with improved communication, greater redundancy and more operator flexibility. While either The Dalles powerhouse or John Day powerhouse will be able to provide supervision of the other powerhouse, on-site operators will staff both continuously. Microwave communications are routinely used for command and control of electric power systems. State-of-the-art of microwave communications is a highly reliable mechanism for interconnecting and controlling geographically distributed power facilities.

*Question 6.* Do you understand the key role that the generation at John Day plays in maintaining the transfer capability and reliability of the transmission system? Due to John Day’s proximity to the California-Oregon Intertie, a loss of generation at John Day would affect both exports and imports of electricity. In the case of failure at John Day, energy would have to be transmitted over greater distances. The further energy is transferred, the harder it is to maintain constant voltage on the transmission system, thus causing the system to be unstable and the higher the energy losses. Wouldn’t you agree that this loss in revenue over a very short period of time would more than cover the added cost for retaining trained operators at the John Day on a 24-hour basis?

*Answer.* The Office of Electric Transmission and Distribution’s mission is to modernize and expand the electricity delivery system, with a focus on reliability. OETD is not involved in decisions affecting operation of specific generation facilities such as the John Day facility.

Control area operators have primary responsibility for grid reliability. NERC policy mandates that all control areas shall operate so that instability, uncontrolled separation, or cascading outages do not occur. OETD assumes that, under any scenarios for John Day, the contractual and operational requirements for grid reliability would need to be met.

I am informed by Bonneville that the value of any capital investment, including remote operation capability, is determined by analyzing the expected savings over time versus the cost to implement. Bonneville informs me that if remote operation is implemented consistent with the control area operator’s reliability requirements, then no degradation of plant availability should occur, and the benefits should ex-

ceed the costs. In the case of John Day, I am further informed that the plant will have trained staff on-site even when the plant is remotely operated. The cost savings is achieved through the increased staffing flexibility associated with plants that have remote control capability.

*Question 7.* Are you aware that experts within the Corps believe that there are structural problems at the John Day Dam and that some believe that the Dam may be at risk, and that the navigation locks themselves may be in danger? I understand that the Corps is already amending \$8 million to address some of these concerns. Is that correct?

Answer. Since neither the U.S.-Canada Power System Outage Task Force nor the Office of Electric Transmission and Distribution address the details of the operation of the hydroelectric dams in the West, I am unable to comment directly on the Army Corps of Engineers activities at the John Day Dam. However, I am informed by Bonneville that the Corps of Engineers has programmed \$11.3 million to address structural problems on the navigation lock during FY 2004. I am told that the Corps, in briefings of Bonneville management, has assured Bonneville that independent reviews have found no evidence that the dam and powerhouse are at risk.

*Question 8.* Isn't it true that the "first response" in the event of a crisis or structural incident at the Dam would be the responsibility of an experienced, trained and senior operator?

Answer. I am informed by Bonneville that a Corps operator would provide a first response, whether on-site or remote. Again, I am told that both The Dalles and John Day powerhouses will continue to be staffed by trained and qualified operators.

*Question 9.* Wouldn't you agree that remote operation of the John Day Dam isn't in the best interest of the region or the nation?

Answer. I am informed by Bonneville that it is the Corps' intent that remote operation of any Corps facility will be done consistent with contractual and operational requirements for electric grid reliability. Additionally, I am told that the Corps, Reclamation and Bonneville expect to explore ways to deliver on these and other requirements in the most cost effective manner for the benefit of the electric ratepayer and the public.

*Question 10.* Can you assure me that this proposal or a variation of it which will have this critical point of the Northwest power grid dependent upon remote control operation will not be pursued further?

Answer. I am informed by Bonneville that this Corps-managed, John Day-The Dalles remote operation capability investment is scheduled to be operational by the end of July 2004. Bonneville informs me that this investment, when completed, will enhance system reliability and operational flexibility since it will provide for operation of either plant from the other (e.g. Corps operators could leave the control room at one project to attend to emergencies at the navigation lock or elsewhere in the powerhouse).

#### RESPONSES TO QUESTIONS FROM SENATOR LANDRIEU

*Question 1.* As you know, my region of the country has long enjoyed reliable and affordable electricity. Given what has happened to FERC approved PJM and MISO why should the Southeast embrace a totally deregulation market concept at this juncture?

Answer. The U.S.-Canada Power System Outage Task Force's investigation has found no particular linkage between the restructuring of the industry and the blackout. The August 14 blackout was caused by:

- An insufficiency of reactive power resources in the Cleveland-Akron area;
- Inadequate situational awareness in FirstEnergy's control room after its energy management system lost some critical functions;
- Inadequate management by FirstEnergy of electrical clearances for transmission lines in its right-of-way areas;
- Inadequate diagnostic assistance of FirstEnergy's problems on August 14, 2003, by MISO and PJM.

The identified deficiencies in specific practices, equipment, and human decisions could have occurred anywhere in the United States, and are not indicative of any problems with a particular regulatory structure. Further, many of the causes of the August 14, 2003, blackout were similar to the causes of blackouts preceding restructuring of the electricity industry.

*Question 2.* Does the Administration have a consistent position on the time-frame for implementation of the Standard Market Design?

Answer. The incomplete transition to a restructured industry poses one of the greatest challenges facing the electricity system today. The transmission infrastruc-

ture is too vital to our Nation to leave in an extended state of uncertainty. Some components of the Standard Market Design are a high priority. For instance, the formation of regional transmission organizations (RTOs) offers tremendous benefits, and must be completed soon to meet regional challenges and maintain reliability. However, the Administration also acknowledges the need to be flexible to accommodate regional needs and differences. Therefore, it is very difficult to give an exact time-frame for implementation since timelines will vary region by region.

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