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Kenneth Haase – SVP, Transmission, New York State Power Authority
Cornelius Holden – Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission; Member, Nuclear Working Group
Thomas Rusnov – Senior Advisor, Natural Resources, Canada, and Canadian co-chair, Electricity Systems Working Group
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Rob Weaver – Infrastructure Coordination Division, US Department of Homeland Security
Joe Eto – Staff Scientist, US Department of Energy, Lawrence Berkeley National Laboratory and member, Electricity Systems Working Group

Members of the Public Commenting:

William J. Museler – President and CEO, New York Independent System Operators
Howard Tarler – Chief, Bulk Transmissions Unit, New York State Public Service Commission
Charles Durkin – Chairman, Northeast Power Coordinating Council
Pete D'Amato – EVP, Valley Group
Frank J. Koza – General Manager, Regional Operations, PJM Interconnection
Toshihiko Furuya – Director and General Manager, Washington DC Office, Tokyo Electric Power Company
Mayer Sasson – Consolidated Edison Company, and Chairman, New York State Reliability Council
Carol Dortch-Wright – Deputy Chief of Management and Operations, State of New Jersey
Michael Caine – US Citizen

PUBLIC COMMENT SECTION

James Glotfelty, Director, Office of Electricity Transmission and Distribution, US DOE

Purpose of Consultation

- We appreciate you all being here with us today, especially in light of the snowstorm that's coming
    - We feel it's absolutely critical that we get your input to ensure that our report is accurate, thorough, and complete in Phase I, as well as we have the most critical recommendations that we can provide to the industry, to regulators at the state and federal level, to legislatures, and to the Congress as to ways that we make our electric system more reliable as we go forward

Procedure for Meeting

- Let me give you a couple of orders of business here first
    - I will limit my comments this morning
    - I will ask Nawal, my counterpart from Canada, to say a few words
    - We will probably have everybody introduce themselves up here, so you actually know who you are speaking to
    - And then we will turn it over to our meeting facilitator, Rich Scheer, who is down here in front
    - And we've tried to limit time for comments
        - And we'll get into how we're going to do the comment period

New York Times Article

- I don't know if you all saw The New York Times this morning, but the article on Page A36 was dealing with our meeting in Cleveland yesterday
    - It said that we had about 65 people scattered among hundreds of chairs,
        - And we had a total of eight speakers
    - And it seems not too much different here
    - But nonetheless, we encourage you all to get up and give us your comments
    - We think that that was a great sign that the accuracy of our report is right on target
        - We think that that showed us that our report was on target and accurate
        - But we still need recommendations coming forward and hope that you all will think especially hard about providing recommendations to us either here today, or in the mail, or electronically
        - And we have provided those addresses at the registration table

Nawal Kamel, Special Advisor to the Deputy Minister, Natural Resources, Canada

Looking Forward to Comments

- We really appreciate your presence here with us
    - Every one of you is worth at least 10 chairs
    - So, thank you very much for being with us
- And we are looking forward to hearing your comments, your advice, your recommendations
    - We will be reflecting upon everything you're going to tell us this morning
    - And we will add to this all the inputs that we will get through the Web site
    - And in addition to this, as you know, we have three working groups
        - And these have several members, a total of 52 all together experts
        - These are on the electricity side, the nuclear side, on the security side

        - These working groups will continue to work using your input, using others' inputs and, of course, using expert teams who are also working with us towards the objective of identifying what went wrong, why it went wrong, and most importantly as we are now moving into the second phase, how to mend what went wrong so that we minimize the risk of it happening again
    - So, we hope that with all these inputs and with additional efforts on both sides of the border, we will be able to put together a set of recommendation that we will present to the Prime Minister of Canada and the President of the United States
    - And we trust that these recommendations will make some significant steps towards ensuring that the citizens of both our countries are reassured about the reliability of the electric system
    - So, thank you again for being with us and we appreciate your input
    - And I hope you will enjoy the discussion as well

James Glotfelty, Director, Office of Electricity Transmission and Distribution, US DOE

Introductions

- Can we start down here and make introductions, so you all know who is, you're actually speaking to?

Kenneth Haase, SVP, Transmission, New York State Power Authority

- My name is Ken Haase
- I'm with the New York State Power Authority
- And I'm a member of the Electric System Working Group

Cornelius Holden, Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission

- Cornelius Holden from the Nuclear Regulatory Commission and a member of the Nuclear Working Group

Thomas Rusnov, Senior Advisor, Natural Resources, Canada

- My name is Tom Rusnov
- I represent Natural Resources Canada
- I'm the Canadian Co-Chair of the Electricity System Working Group

David Meyer, Senior Advisor, US DOE

- I'm David Meyer
- I'm with the Department of Energy
- I'm one of the Co-Chairs of the Electric System Working Group

Allison Silverstein, Senior Energy Policy Advisor to the Chairman, FERC

- Allison Silverstein, Federal Energy Regulatory Commission
- The third Co-Chair of the Electric System Working Group

Rob Weaver, Infrastructure Coordination Division, Department of Homeland Security

- Rob Weaver, Department of Homeland Security, Infrastructure Coordination Division

Joe Eto, Staff Scientist, US DOE Lawrence Berkeley National Laboratory

- I'm Joe Eto
- I'm at the Lawrence Berkeley National Laboratory
- And I'm a member of the Electric Systems Working Group

James Glotfelty, Director, Office of Energy Transmission and Distribution, US DOE

- And with that, we'll turn the mike over to Rich Scheer, who will be our facilitator

Rich Scheer, Conference Facilitator

Procedural Matters

- We've got a couple of ground rules that we would like to operate under in terms of your comments
  - Anybody who wishes to speak needs to register at the desk and will be provided with a number
    - And just like at the deli counter, I'm going to call the number
    - And what you'll do is proceed up to these microphones here and provide your comments to the panel
  - Since we don't have overwhelming numbers of speakers on the list, we are going to allow 10 minutes for you to provide your comments
    - And I'll be sitting right up here and let you know when your time is up
    - If people violate the 10-minute rule, too bad
      - I've got a very annoying egg timer over here that I could use, which has a very loud ring to it
      - And I prefer not to
      - And I'm sure everybody will be perfectly fine with the way that we're going to proceed

Means of Public Comment

- Just want to remind you that there are really – there are four ways for the public to provide comments to this group and the sheet of paper that you may have picked up at the registration desk, gives you all the information you need
  - You can send your comments via the snail mail, if you wish

- There are email addresses for you to send, both in the United States and Canada, to provide your comments electronically
- We have set up a computer workstation up at the top, near the exit sign over there
  - If for some reason, you're too shy to provide your oral comments, you can sit at that workstation and key in your remarks if you wish
- And then the fourth way is for you to register and take a number and proceed up to the microphone

William J. Museler, President and CEO, New York Independent System Operators

About My Organization and Me

- New York Independent System Operator is a not-for-profit corporation in New York
  - We are responsible for operating the grid in New York and for operating the power electricity markets in New York
- Prior to coming to the New York ISO I was the EVP of the Tennessee Valley Authority's Transmission/Power Supply Group,
- And prior to that I was VP of Electric Operations at Long Island Lighting Company
- I was born here in Manhattan
  - I grew up in Queens
  - I am a native New Yorker
  - This is my town
  - And this issue is a personal issue as well as a professional issue

Commendations for Task Force Interim Report

- I want to commend the Task Force on your Interim Report
  - The report is extremely well written and understandable
  - I believe it's painstaking in its data collection
  - And it's factual and objective in its interim conclusions
    - Those conclusions are very similar to the conclusion that we and others made during the Congressional hearings at the initial phases following the blackout

Causes of Blackout

Operational and Human Failures

- There were, as you observed, many contributing factors to this event
- But your report points out very clearly that there was one major root cause
  - And that in my estimation is the operational and human failures involved which precipitated that event: failure to follow well-established reliability rules, failure to react to a clearly deteriorating situation, and failure to notify neighboring systems of the danger and how close to the edge things were in the Midwest
    - Your report cites no less than six clear violations of NERC reliability standards
      - These were violated
      - And I don't believe there is any question that those rules were clear

- They have been established for many years,
- And there is no ambiguity in terms of the responsibility of an operating control area to follow those rules

- In fact, in Chapter 6 of your Interim Report where you describe the events in previous blackouts, that points out very clearly that the majority of the causal factors in most, not all, but in most of the previous blackouts are essentially the same
  - They are operational and failure to follow rules, and even though there are a lot of contributing factors

What Didn't Cause the Blackout?

- What didn't cause the blackout?
- I think your report is clear on that too
  - Deregulation and restructuring did not cause the blackout
    - Obviously there were peripheral issues around that with respect to responsibilities and incentives to follow proper operating practices, but deregulation was not responsible for this
  - Nor in this case was equipment failures
    - There were peripheral failures of computer systems and other electrical equipment, but the operators and the electric systems deal with that all the time
      - That's why we have redundancy
      - That's why we have rules and regulations and processes and procedures in terms of what one does to deal with those situations and not put the public safety in danger by having power system collapse

What Needs to Be Done?

- You're entering a crucial final phase
- What needs to be done?

Root Cause Must Be Addressed

- Clearly, and I believe you're going down this path, you must address the root cause,
  - Your recommendations have to deal with what you've identified as the root causes of this problem, as well as some of the peripheral issues that are important
    - The lack of infrastructure development in the United States in the last 10 years is clearly a major concern, clearly that was a contributing factor
    - But I urge you to zero in on the root cause and make sure that your recommendations address those so that we can move forward and prevent this from happening again

Our Recommendations

- Our recommendations, based on what we know and what you all have provided, fall into a couple of categories
  - One, there is no question but that the reliability rules of North America need to be made mandatory
    - And there needs to be strong enforcement provisions for those rules
    - I would note that here in New York State, they are mandatory

- They are mandatory by regulation, by contract, and in several other ways as well
- And we're accountable for following those rules

- I believe our neighboring systems PJM, New England, Ontario also have those rules as mandatory
- For the country as a whole not to have national reliability standards that are mandatory is unconscionable
- And I know you all share that view
- The challenge is, how do we make that happen?

- Secondly, I believe that what happened in the Midwest is a clear demonstration that some central control agency whether it be an RTO, an ISO-type power pool needs to be mandatory
- The idea of having the Swiss cheese arrangements that existed in the Midwest that, I believe, contributed to a significant amount to this failure is just has to stop
- There needs to be central control of major portions of the power system
- And people can argue over should there be 10 areas in the Eastern interconnection or 15 or 5
- The point is there are areas that are clearly outside of that paradigm now
- And that's a major contributing cause
- So, we believe that has to be done if it can be done legislatively, or through regulation, that's fine, but one way or another that has to happen
- And finally, what this pointed out and this the industry needs to follow up on this, is we need to look at a wider area from the standpoint of communication between control areas, between non-adjacent control areas and not just communication but the protocols, the operating protocols that will define what you do when you learn of certain events that are putting the power system in danger

Conclusion

- Well, in conclusion, I just want to reiterate that I believe your interim report has performed a public service for the country as a whole and for all of us
- The root causes are clear
- And I urge you to stay on that course with respect to preparing your recommendations
- I want to thank you for this opportunity
- And thank you again for the public service that you've performed

Howard Tarler, Chief, Bulk Transmission Systems Unit, NY Public Service Commission

NY State Blackout Inquiry

- On behalf of the New York State Public Service Commission's Chairman Bill Flynn, I want to thank you for this opportunity to provide comments on the November 19 Interim Report
- My name Howard Tarler, I am Chief of the Bulk Transmission Systems Unit for the Commission
- And I was designated by Chairman Flynn to coordinate New York State's formal inquiry into the blackout, which was initiated at the request of Governor Pataki

Acknowledgement of Task Force Efforts

- We would like to acknowledge the efforts of the International Task Force in assembling this information as expeditiously as it did
    - Many of the interim report's findings include necessary and useful data for our own inquiry into the blackout's extensive impact on the state's utility infrastructure
    - So, let me thank you for working so hard to put forth these initial findings

Events of Aug. 14 Blackout

- The interim report presents considerable detail on the events surrounding the August 14th blackout

Information Unavailable to Ohio Operators

- It's clear from the report that an astounding number of adverse events occurred that day and that adequate information was not available to those responsible for operating the systems in Ohio

Reliability Criteria Violations

- Your report concludes that the blackout was initiated in Ohio and identified six violations of reliability criteria associated with those events
    - Clearly, steps need to be taken to ensure that reliability coordinators and control area operators are better prepared and better motivated to follow reliability rules

The Need to Protect Grid, Restore Confidence

- As we all know, New York State suffered the severest consequences from the blackout, including loss of power for 6.7mm of the state's customers as the result of the inactions and violations described in your report
    - This loss of power posed a potential health and safety threat to our citizens, economic losses for our businesses, and a general loss of confidence that hit consumers in what is otherwise one of the most reliable systems in the world
        - In addition to understanding what happened on August 14, recommendations need to be made and specific steps must be taken to protect the grid and restore that confidence

Work Yet to Be Done

- The interim report recounts event leading to the power surges, frequency swings, and voltage fluctuations that pulled down the electric systems in Ontario and New York,
- But as well done as the interim report is, it is obviously not yet complete
    - In the report's own words, 'The first phase was to focus on what caused the outage and why it was not contained.'

What Was Role of Loads in Nearby States?

- There is still work left to be done, to analyze the events in the areas immediately adjacent to New York, so that we here in New York can better understand why the New York system was so severely impacted
    - We do not believe that you can continue the process into the recommendations until you have fully considered the reasons for and the impacts of the transmission system events in New Jersey, Pennsylvania, Ontario, Connecticut, and Massachusetts
        - Those events profoundly affected New York and affected New York's ability to withstand electric disruptions and surges from outside its boundaries
        - Specifically, we respectfully request that the Task Force investigate and report on what the impact was of loads in Northern New Jersey and Southwest Connecticut being isolated onto New York City and Long Island areas
            - The findings presented to date do not answer the question as to whether New York City and Long Island would have totally blacked out from the events occurring in Ohio and Michigan as these added loads not been borne by the New York City and Long Island systems or what role, if any, the adjacent external loads play in pulling down the New York City and Long Island systems.
            - Further, we would like to see the joint Task Force analyze and fully report on what happened in those adjacent areas, whether automatic load shedding was in place and whether it properly operated and what needs to be done to mitigate a future recurrence of similar events

What Was Role of Ontario Generation?

- We respectfully request that Task Force provide further explanation to support its conclusion that New York was aided by generation in Southern Ontario that split and stayed with Western New York
    - Ontario is an important economic partner for New York State, particularly Western New York
    - It is critical that the Task Force's final report identify and explain anything unique about the interconnections between Ontario and New York that might prove beneficial to that partnership in the future or that might prove valuable as we examine the regional interconnections among the states
    - However, it is important to note that the split referenced in the report preceded and quite possibly contributed to the tripping of several large nuclear units in Western New York
    - As a result, it is not yet clear to us whether this split may have affected our grid's ability to withstand the cascade, keep New York generators operating, or if it affected our ability to restore load due to the significant time it takes to restart nuclear units
    - This analysis will be an important ingredient in any recommendations that you make in your report

What Was Role of Power Imports?

- There were also references in the report that in aggregate seem to suggest that New York might not have been able to survive the system separation from PJM and New England because it was a heavy importer of power
    - Our information is that, aside from the normally occurring import of power from Quebec, which continued both during and after the event, very small and operationally-insignificant amounts of power were being imported into New York State at the time of blackout
        - These facts, if confirmed by your team, in conjunction with the information and analysis we have requested about the events in the surrounding states may present a clearer picture of what happened to the electric system in New York

What Was Role of Transmission Ties?

- The opening of the transmission ties between PJM in New York and also the ties between New York and New England may have made the difference between Ontario and New York withstanding the event or blacking out
    - We are looking forward to the analyses that would answer that question because that is critical knowledge for developing any recommendations during phase two
        - The interim report notes that you have performed detailed examinations of thousands of individual relay trips but the details are not present in the report
        - We are very interested in knowing the detailed information you have reviewed and the results of the technical analysis you have performed concerning the opening of the transmission lines surrounding and connecting to New York
            - That includes not only the tie lines to New York but also the detailed information about the internal line openings in New Jersey and Connecticut when those systems came apart and were left hanging on to the New York control area

Additional Analysis Needed

Report Only Starting Point

- Again, on behalf of Chairman Flynn, I want to thank you for the opportunity to comment on the interim report
    - In summary, it is clear that a great deal of the work and effort went in to pulling this report together
    - We think it is an excellent starting point, but should serve only as a starting point

Events Outside NY Had Impact

- We feel strongly that additional analysis is essential to better understand the impact on New York
    - While staff at the Public Service Commission are diligently working to complete our own formal inquiries of what happened, it is clear that events occurring outside our borders greatly impacted the system and only by better understanding these events can we develop a complete and accurate report

- These events go well beyond the blackout triggering events occurring in Ohio, including each of the surrounding systems
  - We are not interested in placing blame on these systems but simply to better understand how events occurring on these systems, helped or hampered our system in its recovery and working with you to develop recommendations that improve the reliability of the interconnected grid

James Glotfelty, Director, Office of Electricity Transmission and Distribution, US DOE

- Your comments were appreciated and very detailed and I would encourage you to – since they were so thorough and detailed - to submit them electronically also so that we can make sure that all the working members have them

Howard Tarler, Chief, Bulk Transmission Systems Unit, NY Public Service Commission

- Absolutely, I have been informed that we have submitted them and if not they will be arriving shortly

Charles Durkin, Chairman, Northeast Power Coordinating Council

My Career

- My name is Charles Durkin, I am Chairman of the Northeast Power Coordinating Council
  - Before that position I worked for about 33 years with Consolidated Edison, the power company in New York City
    - And during that period of time I was responsible for, a good portion of that time, for the operation and design of the power system

About NPCC

- NPCC is the international regional electric reliability organization for Northeastern North America
  - NPCC was formed in January 1966, shortly after the1965 Northeast blackout to promote the reliability and efficiency of the interconnected power systems within this geographic area through the coordination of their system planning and operating procedures
  - NPCC provides reliability assurance from New York and the New England states as well as Ontario, Quebec, and the Maritime Provinces

Task Force Analysis of NPCC

- The US-Canadian Task Force is to be commended for its efforts analyzing the events leading up to the blackout experienced August 14
- The interim report clearly indicates that the NPCC region was not the cause of the event but was engulfed by an unprecedented power tsunami

- In fact the NPCC region withstood, without advanced warning, the initial power surge from the Midwest and remained stable but was eventually overwhelmed by the cumulative effects from the large onrushing power flows and severe frequency and load oscillations
  - The subsequent power swings islanded portions of the NPCC's region from the rest of these interconnections
  - The dynamic interaction experienced within the NPCC region continues to be the subject of additional analysis
    - NPCC respectfully requests that the US-Canadian Task Force maintain its body of technical experts structure and ask for their support during the completion of NPCC's ongoing post-blackout analysis

Reliability Standards

Appropriate Action Not Taken

- Initial findings in the interim US-Canadian reports indicates the First Energy and the Midwest independent system operators were in violation of North American Electrical Reliability Council reliability standards and that the fundamental obligation of each interconnected systems to operate each system in an analyzed state was not complied with on August 14 by these organizations
- The NERC Board of Trustees in its post blackout near term actions emphasized that the reliable operation of the bulk electric system requires a responsible industry to understand the importance of assuring their systems are operated within the designed criteria and within conditions known to be reliable to analytic study
  - If the power system enters into an unanalyzed state, these entities must have the authority and capability to immediately take appropriate actions to return the power system to a known safe condition
    - The interim report makes clear that the appropriate action was not taken and the capability to take such actions might have been inadequate

Adequacy + Security = Reliability

- Fundamental reliability requirements derives from two concepts, adequacy and security--having sufficient assets in place to meet loads and operating those assets in a prudent manner
  - Adequacy requires that the necessary assets be in place including not only generation and transmission assets but also related control equipment, training, and procedural coordination among neighboring entities, contingency analysis, and other computational tools and equipment, with the appropriate backup to permit the load to be supplied while maintaining declining security margins
    - It appears that First Energy and MISO assets were inadequate to contain the initial events of August 14 within their system
  - Operational security requires a coordinated operation of assets to maintain specified reliability margins
    - Often referred to as n-1, it refers to continuous capability
    - In order to minimize the probability of cascading failure, providing for operator training and corresponding emergency action plans and tree-trimming management are examples of programs that need to be in place so the system can be operated securely

- The ability to coordinate the operation of assets on August 14 was clearly deficient

Operate System According to Design

- The system must be operated consistent with its design in order to reap the economic and reliability benefits associated with interconnection

The Need for Local Action

- One primary responsibility of the operating entity is that local actions must be taken to keep local problems from spreading
  - This did not happen August 14

NPCC's Approach

- The design basis approach for assuring reliability of the power system used in NPCC requires the system be designed in order to withstand representative contingencies as specified in this criteria and subsequently operated consistent with that design within an analyzed state
- Parameters for assessing system design and operation for normal transfers, emergency transfers and extreme contingency assessment are defined within NPCC criteria

Needed: Industry-Wide Reliability Criteria

- NPCC supports current efforts to provide for enforceable reliability criteria industry-wide
  - NPCC's reliability criteria are mandatory under the NPCC membership agreement and enforceable through its reliability, compliance and enforcement program
    - This program continues to demonstrate its effectiveness in assuring that NPCC's membership meets the reliability requirements
    - The program focuses on those criterion standards that have a direct impact on reliability of the bulk power system
    - Compliance to reliability standards in NPCC is sustained through a combination of non-monetary sanctions including formal notification to state and federal regulatory authorities and well-designed markets
    - The NPCC program has clearly demonstrated the effectiveness of using non-monetary sanctions and market mechanisms together to achieve reliability objectives
  - NPCC maintains that development of North American-wide reliability standards should represent a floor rather than a ceiling
    - More stringent resource criteria and rules that acknowledge unique regional needs makes for a more robust overall system, especially when operations outside of the normal systems conditions are encountered
    - Additional regional reliability requirements provide for extra margin that has flexibility when extraordinary events occur

Summary

- In closing, I want to thank you for the opportunity to share NPCC's suggestions for improving the reliability of the electric system in order to minimize the likelihood of a widespread blackout
- Each interconnected system must provide an adequate set of tools, resources and procedures necessary to operate the system according to its design and within conditions known to be reliable through analytic study
- Each system must be capable of taking local actions to keep local problems from spreading
- The events of August 14th fully demonstrate the need for mandatory reliability standards for the electric systems, standards that define not only the reliability objective but also the obligation to provide the capability to achieve that objective

Pete D'Amato, Valley Group

About Valley Group

- We're a vendor of transmission line thermal monitoring systems

Commendations to Task Force

- And we wish to commend the task force on the very comprehensive and exceptionally well written interim report

Impact of Weather on Blackout

Wind Speeds Fried Wires

- Just wish to call closer attention to one of the most significant underlying causes of this event, which was not adequately discussed in the report and that is that the weather conditions on that day in Ohio were not at all normal for the season
    - Specifically, low wind speeds caused all overhead lines to operate at much higher temperatures and therefore sag much lower than the utilities' ratings would have otherwise predicted
    - Operators were being blind-sided not only by SCADA failures but also by a false sense of security of their line ratings earlier and throughout that day

Errors in Report

- The Interim report implies on Page 37 that quote, wind speeds at the Akron Ohio Fulton Airport averaged 5 knots around 1400 EDT, but by 1500 EDT, wind speeds had fallen to 2 knots, the wind speed primarily assumed in conductor design or lower
    - This sentence contains both errors and statements subject to misinterpretation namely that airport wind speeds are single hourly observations but not averages
        - An observation taken five minutes earlier or later could have vastly different values, especially for low wind speeds
    - Secondly, airports are in open spaces, transmission lines are in sheltered corridors

- Studies have shown that wind speeds on transmission corridors are typically about half of that measured at nearby airports
- Third, the most common wind speed used in rating assumptions in the US is 2 feet per second, not 2 knots, which is about 3.5 feet per second
  - The consequences of that seemingly insignificant difference are in fact very significant
- And last, even if the wind speed at the airport were 2 knots, the cooling effect of wind is highly dependent on the angle of incidence to the conductor
  - An observation of a 2 knot wind speed does not mean that a rating based on a 2 knot perpendicular wind is in fact the same

Public Utilities Fortnightly Article

- A recent article in Public Utilities Fortnightly, titled Fried Wire, of which you have copies and copies are at the registration desk, describes the wind conditions in Ohio preceding the blackout in much greater detail
  - It shows that in fact many transmission conductors at most Ohio utilities were operated at much higher temperatures than the operators were led to believe based on the initial ratings

Underestimation of Line Sag

- Further, it is likely that many of these lines were designed with older sag tension programs, which are now known to underestimate line sag at high temperatures, further contributing to hazardous conditions

Clearance Limits Exceeded

Thermal Limits Established for Public Safety

- The Interim Report deals with the reliability consequences of these events, but fails to address the primary reason for establishing thermal limits in the first place
  - And that is public safety, to ensure the transmission lines are always operated above National Electric Safety Code mandated clearance limits
  - According to local reports, there were 64 phase-to-ground faults on that day from Ohio
    - This indicates that many of the lines in Ohio sag substantially below their mandated code clearances
      - It's most fortunate that none of these resulted in bodily harm or fatality

Practices Diverge from Requirements

- There is substantial incongruence between NESC requirements and utility practices
  - NERC has left the decision on establishing maximum line ratings entirely to the transmission owners who also have a commercial interest in pushing these assets to their absolute limits
  - Nationwide, there is a wide variety of thermal rating assumptions among the transmission owning utilities, most without any clear rationale and hardly defensible in light of the present knowledge
    - For example, many utilities base normal ratings on low wind speeds and emergency ratings on higher wind speeds

- Well, is this to suggest that when a transmission emergency occurs, the wind will start to blow harder?

▪ Some utilities base their ratings on assumptions of 2 feet per second, some on 3 feet per second, some on 2.5 feet per second wind speeds, some even higher
  - In contrast, some countries specified by law the weather conditions which are to be used in transmission line ratings
  - Such countries include Germany at about 2 feet per second and Japan at about 1.6 feet per second

Our Recommendations

- So, we would like to make the following recommendations

Clear, Consistent Thermal Limit Rules

- One, that FERC should establish a Task Force to define clear and consistent rules regarding the methods by which transmission owners determine the thermal limits of transmission lines
  - Such rules should include methods by which relevant weather and conductor data is collected for and applied to line rating calculations, methods by which line sags are calculated and the related minimum safety clearance margins and provide clear definitions for the use of normal and emergency ratings and allowable time limits

Monitor Lines When Limits Exceeded

- Second, it should be mandated that operation of transmission lines at loads in excess of these established thermal limits be allowed only when lines are monitored by thermal monitoring equipments, ensuring deterministic safety while allowing higher ratings under favorable weather conditions which in fact occur most of the time
  - So, there is an awful lot of additional capacity that can be safely utilized out there
  - There is also an awful lot of blind risks being taken as we now know in the lack of any clear knowledge of what's really going on at any given point in time

Training Guide for Operators

- Third, NERC should establish a training guide for all system operators regarding the reasons and applications in theory behind thermal line ratings to provide better understanding of what the operators are really dealing with when they are looking at a static line rating

Enlist Technical Assistance

- And fourth, it is suggested that NERC and FERC enlist technical assistance for these tasks from the relevant committees of CIGRE and IEEE

Frank J. Koza, General Manager, Regional Operations, PJM Interconnection

About PJM Interconnection

- PJM is the regional transmission system operator and market operator in the Mid-Atlantic States and portions of the Midwest, and we are also reliability coordinators for several systems in the Midwest

Report Professional and Comprehensive

- PJM commends the Task Force for its work in developing what we believe is a professional and comprehensive report

Support for Museler and Durkin

- We also stand here to support the comments of Mr. Museler and Mr. Durkin regarding the root causes and what we believe is how the Task Force needs to address those root causes

We'll Help Improve Situation

- And PJM stands ready to work with the Task Force and other interested parties in implementing any recommendations that come out of Task Force work to improve the situation, such that an event like this would not happen again

Toshihiko Furuya, Director and General Manager, Washington Office, Tokyo Electric Power Co.

Focus on Reliability

- TEPCO's primary focus is in keeping on improving reliability, the availability to our customers at the most important part of power grid management
- While you consider ways of improving reliability in the United States, today I would like to share with you some of our experience regarding TEPCO power system operation

Background

1987 Blackout

- As background information, in July 1987, TEPCO experienced a widespread blackout, which was caused by voltage instability
    - At that time, our operating point was close to the voltage stability limit because reactive power was consumed by the heavy power flow on the network

Voltage Stability Improved

- Since then, TEPCO has made many efforts to improve the voltage stability by installing numerous capacitors as well as operating the automatic voltage control themes on the controller

- Now, TEPCO stably operates the network of over 60,000 megawatts
    - This is almost equal to the amount of electricity demand of the PJM Interconnections area

Recommendation 1: Unify Flow Management

Reactive Power, Voltage Control Issues

- Based on our understanding of the Interim Report, we would like to make the following two recommendations
- Firstly, we support that the supplied amount of reactive power and the voltage control management were not adequate

Unify Active, Reactive Power Flows

- In this regard, we will drive to recommend that the management of both active and reactive power flows should be unified over the network
- At the same time, each control area should take the necessary measures to supply reactive resources required within the boundary
    - Starting from the power flow diagram on page 15 of the report, we could see a large amount of reactive power that was supplied to the area of Dayton Power and Lights, the American Electric Power and the Northern Indiana Public Service
    - This could only means that the system voltage of DPL, AET and the NIPS was dependent on and supported by the reactive power from the surrounding electric power companies while the three companies where supplying active power
        - So, such an unbalanced supply of reactive power would put the excessive thrust on the generators in the areas that export reactive power
        - And the areas that import the reactive power, if voltage instability becomes serious, it goes to the limits increasing also the reactive power, which seriously jeopardizes the voltage stability, within the generator or transmission line to it
            - This would mean a possible voltage collapse

More Capacitors, Slower Reactive Power

- Regarding this blackout, the end line three phase occurred at the point in time when the reactive line failed such as the as the Eastern line
    - Here is a possibility that both voltage stability and dynamic stability had reached their limits
    - We should recognize that in such circumstances it would be difficult for system operators to take measures to prevent the cascading power failures over the telephone
        - This would be an impossible feat for any operator
    - Therefore, we recommend installing larger numbers of shunt capacitors in the areas where the voltage dips and allocating the amount of reactive power by generators at a lower rate of capacities then used under normal conditions
        - This should prepare you for any possible outcome

Automatic Switching Control

- Furthermore, in the case where the system voltage is manually regulated by the production of system operator, the system voltage may drastically decline if the reactive power supply does not cope with the load caused by power system failure
    - Eventually, the power system may result in a voltage collapse along with a decrease in power transmission capability used to the degrade the dynamic stability
    - We believe that the automatic switching control over shunt capacitors, is much more desirable than making the shunt capacitor operate just before or outside the generator

Recommendation 2: Prevent Cascades

- Secondly, we also believe that the equipment should be strained appropriately with consideration given to preventing cascading power failure

Impact of Deregulation

- In the United States, the operating conditions of power systems are drastically changing due to the deregulation
    - It is necessary to carefully verify whether system operators have appropriate responses to these changes
        - For example, system operators increasingly supply move electricity across a wide area
        - But have they upgraded their power systems to facilitate such enormous rates in order to prevent cascading power failure
        - Also in the case that the power system operation depends on real time contingency analysis, it is expected that our RCCA may not be functioning due to the EMS failure
            - And it may also be impossible for RCCA to cover a huge number of ten minus two contingency analysis

Needed: Offline Situational Analysis

- Therefore, we recommend that system operators conduct frequent offline situational analysis by the detailed operational models of various power systems
    - Through these concrete results, possible cascading power failure scenario should be identified, and where necessary counter-measures should be applied in retaliation for such emergencies

Automatic Load-Shedding Scheme

- And finally, the immediate outcome seems bridged by the overloading relay may cause the other equipments to overload, thus resulting in a cascading failure
    - To present this kind of cascade, automatically load-shedding scheme ready to overload will be the most effective measure to take

Conclusion

- These are the recommendations

Mayer Sasson, Consolidated Edison Company, and Chairman, NYSRC

About NYSRC

- I work for Consolidated Edison Company of New York, a company that is providing the lights in this room today
- And first, although I am working for Con-Edison in New York, I am here to speak on behalf of the New York State Reliability Council
    - And some of you may not have heard about the council,
    - And I hope I could enlighten you a little bit about the council today, because we think that it may have something to contribute to your recommendations

Commendations for Task Force

- I also want to add my name to all the previous speakers that commended the Task Force for the work that they have done
- Since they have all talked so highly about all aspects of the report, I'd like to add one that they hadn't yet
    - I found the report very, very instructive from a power systems analysis point of view
        - It's not very usual that you find a report that explains what VARS are
        - And we even talk about the state estimator
            - And you sort of explain what it is
            - That was particularly interesting to me because prior to working at Edison, I worked for many years at American Electric Power
            - And I was part of the team that installed the very first state estimator ever
            - And that was done at the AEP System in 1972
- So, I was very pleased with the report

NERC, Regional, and Local Reliability Rules

- But today, I am here to offer some recommendations for the establishment of mandatory reliability rules as a firm foundation for minimizing the risk of future blackouts, provided that more stringent reliability standards may continue to be promulgated by regional and local entities
    - And we talked a lot about NERC rules
    - I would like to make a point about regional and local rules and what Mr. Durkin talked about – at NPCC, we call that regional
    - The work of the New York State Reliability Council, the council was formed in New York
        - We call it local

New York State Reliability Rules

- The NYSRC, the Reliability Council is pleased to have the opportunity to comment and make recommendations for Phase II of investigation regarding minimization of future blackouts

New York Reliability Rules Mandatory

- First, it should be indicated that in New York we currently have reliability rules that are mandatory over the New York Independent system operator
    - You heard Bill Museler earlier mention this
- But they are not only mandatory over the New York ISO
    - They are also mandatory over all market participants in New York

Rules Cover Planning and Operations

- These rules cover both planning and operations
    - And I think that's an important aspect when we talk about assets, the assets have to be started with planning to have a system that's adequate
    - The operations are all the rules that need to be followed to operate the system reliably
    - And these rules are the foundation for maintaining reliability and preventing blackouts

Rules Include Regional, State, Local Rules

- Also the rules include all NERC rules in New York, all the NPCC rules as well as the more strict and more specific rules developed by the NYSRC itself, targeted to maintain reliability within New York State and within New York City

Rules Must Be Floor, Not Ceiling

We Must Recognize Special Conditions

- The recommendation we therefore wish to make today is for having national, regional, and local reliability rules that recognize special regional and local conditions and having such rules mandatory over all entities that design and operate the power systems as well as over all market participants that use the transmission system

Must Be Compliance Function

- There must be, as other speakers have also mentioned, a compliance function to monitor observance of such rules
    - Another way to say what I just mentioned is as it has already been said is that the rule should not be a – a rule that will become mandatory cannot be considered to be a ceiling, they need to be considered a floor – the national rules need to considered a floor so that the regional and local rules can respond to regional and local conditions and develop perhaps more stricter rules if they are justified because the need are there for reliability

New York's Structure

- It is instructive to discuss how New York adopted a structure that enabled it to have national, regional and local mandatory reliability rules

Role of NYSRC and NYISO

- The New York SRC and the New York ISO are both FERC-appointed entities
  - And I am sorry that Allison is hearing this for the second time if I copied this on Monday
- The New York ISO runs all markets
  - And it is responsible for day-to-day reliable operations in accordance with the New York State Reliability Council rules
- The council in turn by its agreement, approved by FERC, must adopt all NERC rules and the stricter rules of NERC's regional council, which is NPCC
- The Reliability Council itself develops more stringent rules than those of NERC or NPCC necessary to address special reliability needs for the state and the city

Rules Mandatory for Market Participants

- There is also an agreement, a contract, between the council and the ISO
  - These two bodies are at the same hierarchical level
  - And that agreement makes all reliability council rules and therefore NPCC and NERC rules mandatory for the New York ISO
  - In turn, all of these New York State Reliability council rules and NERC and NPCC are mandatory for all market participants under the New York ISO tariff, which again is FERC approved
    - All these agreements that I have mentioned and this tariff has been approved by FERC
    - FERC therefore has the authority today to approve new market structures that can also promote and preserve reliability
  - So we hope that in your recommendations you find a way to link the mandatory nature of rules for national, regional and local, to the regulatory bodies that today have the means of making them and putting them in place and making them mandatory to the market

Reliability and Markets Separated

- In response to FERCs Order 888, the dual New York ISO/New York SRC structure was proposed to FERC by the New York Power Pool – the Pool was the pre-existing body to the New York ISO – to preserve reliability by separating the responsibility for the promulgation of reliability rules from the responsibility to implement these reliability rules and to adopt rules for the operation of the competitive markets
  - So, therefore, the idea is: separate reliability from markets, the promulgation of reliability rules from the market promulgation of market rules

New York ISO Responsibility

- The New York ISO was given the responsibility for day to day reliability in coordination – this is very important too – with the activities of the utility control rooms in the state, because in a way the utility control rooms that pre-existed the ISO became adjunct to the ISO as a partner to maintain reliability in coordination with the ISO

NYSRC Didn't Start from Blank Page

- At the starting point the NYSRC had to initially adopt all pre-existing NYPP rules, the New York Power Pool rules and therefore did not start from a blank page
  - It was considered very important to preserve the planning and operating rules adopted by the New York Power and the New York PSC based on decades of experience in the operation of the New York State Bulk Power System
    - Again this is important
    - We should not start on reliability from a blank page
      - There is decades of experience that need to be brought in and grandfathered, if you will, as we move forward and making rules mandatory

NYSRC Requires Technical Expertise

- Furthermore, the New York SRC agreement requires members of its top bodies of its executive committee to have technical expertise
  - And that's why I was particularly interested about technical expertise that you put into your document
    - Power system reliability is first and foremost a technical subject

Monitoring Compliance

- The NYSRC as well as NPCC have the responsibility to monitor compliance with their rules
  - Both entities have non-monetary penalties associated with their compliance programs and they have worked effectively
  - New York does not have a reliability compliance problem

- The New York SRC trusts you will find these remarks of value in your task of developing recommendations for the minimization of risk in future blackouts
- Thank you very much and we will be submitting these comments electronically

Carol Dortch-Wright, Deputy Chief of Management and Operations, State of New Jersey

Recognition of Task Force Work

- I serve the people of New Jersey as the Deputy Chief of Management and Operations in the office of the Governor
- And on behalf of New Jersey's Governor James E. McGreevey and Jeanne Fox, President of our Board of Public Utility, and the people of New Jersey, we thank you for this opportunity
  - And we thank and acknowledge all of those individuals who have spent time and effort in the completion of this report

Conclusions of Interim Report

Origins of Blackout

- The interim report by the United States / Canada Task Force confirms what many have speculated about the cause of the August 14th blackout

- The combination of insufficient regional oversight and lack of real-time data, and deficiencies in grid maintenance and management helped begin the outage
- The blackout then quickly cascaded, as the safeguards in our system were unable to isolate it before 50mm people were without power

Needed: Better National Energy Policy

- This report provides more powerful evidence that we need a better, long-term national energy policy if we are to ensure the reliability of our grid that consumers deserve

Gov. McGreevey's Recommendations

- Governor McGreevey has advocated for three steps that would address many of the problems cited in this report
  - First, mandatory transmission grid reliability standards
  - Next, mandatory participation by all utilities in a regional transmission organization
  - And increased federal funding for grid investment with a particular focus on smart grid technologies that will eliminate much of the poor data and system response that helped cause this blackout

New Jersey's Steps

- In New Jersey, we are investing in our grid
  - We are in discussions to begin piloting smart grid technology
  - And we belong to an effective regional transmission organization

Federal Leadership Needed

States Cannot Ensure Reliability

- Individual states alone however cannot ensure the reliability of our electric infrastructure, Federal leadership is needed

Energy Bill Fails at Leadership

- Unfortunately, the highly partisan energy bill most recently before Congress failed to demonstrate the type of leadership that is necessary to address these important issues
  - With an estimated $25B in tax breaks for big utilities and energy traders, the bill has provided too many corporate giveaways at the expense of average consumers
  - And by weakening environmental regulations and under-investing in renewable energy, we failed to strike a balance between secure energy production and environmental protection

Hopes for Grid Reliability Bill

- If Congress is unwilling to craft a comprehensive energy bill that truly serves the interests of the people, it is our hope that Congressional leaders will pursue a separate bill on grid reliability that will avoid the pitfalls of the omnibus bill

- This separate reliability bill should include the mandatory reliability standards in the latest omnibus bill, but also increase smart grid investment and require regional transmission organization participation

Put Politics Aside

- As the Task Force's interim report clearly shows we need to put politics aside and address the critical needs for our electric infrastructure

Michael Caine, US Citizen

Put Politics Aside

- First, I'd like to thank the Joint Task Force for holding this public comment period, promoting the democratic process
  - I do appreciate that very much, thank you all for coming here today
- Actually, before I get into this, I would like to think, I believe her name is Ms. Dortsc for her comments
  - I think she was right on point with what she was talking about what's going on in Congress
  - Politics really does needs to be put aside

Who I Am

- My name is Michael Caine, I'm a resident of Nassau County, Long Island, and an American citizen
  - And that's how I appeal to you all, as an American citizen
- Recently, I have completed a report myself about the blackout based on mainstream news reports, official recognitions, eyewitness accounts
  - I love my country very much and I couldn't bear the thought of this critical line of investigation going unexplored
  - But every journalist that I contacted, they chose not to use me as a source

Acknowledgement of Task Force's Work

- I've read much of the Interim Report produced by the joint Task Force which was very well done
  - And I appreciate the report and its finding as well

Doubts Tree Causality Scenarios

- I'd like to draw attention just very briefly to the five 345-kilovolt power line that are set to be taken down by trees, and in the report trees are listed as a common causalty
  - It seems to me, I don't have the expertise in any way
  - But it seems to me that there are many potential holes in many of the tree causality scenarios in the report

- And I can't go into details on this as I really don't have the time provided here or the expertise either as you have

Issues Detailed in My Report

- But what I do have the time for is details of issues the Task Force maybe unaware of which is detailed in my report
  - I do have copies here for anybody that wants it when this is done

Role of Electromagnetic Pulses?

- The first is that, there seems to have been no investigation into whether or not electromagnetic pulses played a role for causality in the blackout
  - And the only reason that I bring that up is because we know that HAARP was turned on at the time at 4 pm on August 14th, just 11 minutes before the blackout happened, while as you know there were other causalities and things as well earlier, but that's when it all came to a head right around that time
    - Now, HAARP is an acronym for High Frequency Active Auroral Research Program, and this is located in Alaska
    - HAARP does have the capability of producing electromagnetic pulses at frequencies that can cause a localized blackout over long distances whether intentionally or unintentionally
    - The fact that HAARP was turned on at precisely the time in which the blackout seemed to occur cannot be overlooked in order to ensure the credibility of the joint Task Force findings
    - Now, HAARP is primarily sponsored by the Air Force weather agency
    - And I strongly recommend that the Air Force be contacted and asked to disclose records to the joint Task Force to reveal what HAARP was used for on August 14, 2003 at precisely 4 pm and earlier in that day

Why Militarization of Canadian Border?

- In addition to this, I received a report from a friend that at 1 pm on August 14, just three hours before the blackout occurred, the Canadian border was militarized
  - And everyone who crossed was fully searched in the Mohawk River Valley region
  - Now, this is odd and I don't know what this was for
  - I think that is cause for investigation as well

Why Aerial Aerosol Spraying?

- In addition to this, at 8 pm on August 14, 2003, I looked up in the sky in Nassau County where I live
- And I saw three gigantic aerosol clouds left by planes
- Over the course of one week, I interviewed half a dozen eyewitnesses to this aerial aerosol spray operation and was able to confirm two things
  - One, the spraying was definitely conducted by planes
  - And two, whatever was sprayed was low enough for the population to experience an incoming
- I called Lieutenant Colonel Casey Brady who was up in Rome, New York, where our NORAD is stationed in New York
  - And I asked her about this aerosol spray operation that was witnessed by multiple people during the evening of the blackout

- She asked if it was possible what we saw was contrails
- No, it is not possible for two reasons
  - One, contrails only form at high altitudes
    - And this was very low
    - And there was an incoming on the population that I witnessed, and multiple other people with me
    - And I have interviewed witnesses
  - And two, according to CNN and other mainstream reports, La Guardia and Kennedy Airports, which are the closest airports to us, were grounded until 8.30 pm that night due to the blackout and incoming flights were being diverted to other airports
    - So, there were no commercial aircraft in the air at that time which is the perfect time for such an operation to be, have the air free for it

Blackout and Determined Promise 2003?

- In addition to all of this, on August 15th, the very next day, the Associated Press announced Determined Promise 2003
  - Now, this is a national military exercise scheduled to begin in Alaska and Nevada in which one of the operations would stimulate a biological attack with pneumonic plague
  - This was just one day after the blackout, this was announced
- It was stated that the Northern Command said it had no relation to the blackout in that report
  - And that report from AP is in my report as well for you to review

Cyber-war Against Power Grids?

- Now, to go back over a year ago, on July of 2002, the President, President Bush signed National Security Presidential Directive16 which I will refer to as PD 16
  - PD 16 was a secret plan for the United States to wage cyber-warfare against other country's power grids
  - And Mr. Wayne Madsen, who has some 20 years of experience in computer security and data privacy and a former US naval officer reported this
  - Part of the PD 16 will be ducked
  - But we still do not know the depth of PD 16, and whether there is a provision in it that pertains to North America

US Military Government?

- Finally, General Tommy Franks recently, in an interview with Cigar Aficionado said that if there is one more terrorist attack that occurs in America, the US Constitution will be scrapped in favor of a military government

Read My Report

- I appeal to the hearts and the minds of the Commission here on this
  - Please I hope that you do read my report and the supporting documentation of it
  - I offer it just as a patriotic American for what I witnessed
  - I didn't want to do this report
  - I'm not a professional journalist
  - I saw something

        - And it led me to this investigation
    - That's why I appeal to you on this

9/11 Commission

- And just one final thing
- There's another commission happening right now that I've been following very closely
    - I'm working with the family members of 09/11 victims and September 11 advocates as well as other groups that have been following that commission closely
    - It's very unfortunate what's happened in that commission
        - It appears that we're not getting full disclosure
        - And the family members are very, very disappointed in that
        - And there is a lot happening around that now
        - That commission appears to already, is going to be relegated to the insufficiently investigated what happened
        - And I would hate for this commission to have that same historical reference

Conclusion

- Again I appeal to the hearts and minds of the commissioners here to please take note of this and look into this and I again very much appreciate your time
    - I very much appreciate the report you did
- Thank you very much
- And if any of the commissioners want, I have the report on me right now
    - I'll hand it to you right now if anybody wants

Rich Scheer, Conference Facilitator

Ways to Submit Comments

- Let me just remind everybody that there are four ways to submit public comments
    - If you wish to speak, you can come up here and register and get a number
    - We also have a computer workstation upstairs for those of you who are maybe too shy to talk and would like to offer your comments in writing
    - There are two email addresses, one for the United States, and one for Canada, to submit comments electronically
    - And finally there's the regular mail, one for the United States and one for Canada

James Glotfelty, Director, Office of Electricity Transmission and Distribution, US DOE

- I think what we would like to do is, as we did in Cleveland yesterday, is just recess for a little while, perhaps until 11 o'clock to see if other speakers are interested in coming forward today
    - So, we will reconvene here at 11 and evaluate whatever speakers may come

James Glotfelty, Director, Office of Electricity Transmission and Distribution, US DOE

- Ladies and gentlemen, after the last hour, we still do not have any other members of the public that have asked to testify
- So, I think what we will do is, we will stay around till noon
    - We will continue at the computer upstairs for others to send in electronic comments for a couple more hours this afternoon
    - But, I think the majority of everybody can probably leave and try and get ahead of the weather that is moving in
    - And I guess, I will just remind everybody that there are other ways that they can submit comments electronically over the Internet or through the regular mail, and would encourage those who have not talked yet, to go do so

QUESTION AND ANSWER SECTION

No Q&A Session was held in conjunction with this call