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Before the
FEDERAL ENERGY REGULATORY COMMISSION
966th Open Commission Meeting
Thursday, January 20, 2011
Hearing room 2C
888 First Street, N.E.
Washington, D.C.

The Commission met, pursuant to notice, at 9:05
a.m., when were present:

COMMISSIONERS:

- JON WELLINGHOFF, Chairman
- MARC SPITZER, Commissioner
- PHILIP MOELLER, Commissioner
- JOHN NORRIS, Commissioner
- CHERYL A. LaFLEUR, Commissioner

FERC STAFF:

- Kimberly Bose, Secretary
- Mike Bardee, OGC
- David Morenoff, OGC
- Norman Bay,
- Jim Pederson, Chief of Staff
- Jeff Wright, OEP
- Mike McLaughlin, OEMR
- Joseph McClelland, OER
- Jamie Simler, OEPI

P R O C E E D I N G S

(9:05 a.m.)

CHAIRMAN WELLINGHOFF: Good morning. This is the time and place that has been noticed for the open meeting of the Federal Energy Regulatory Commission to consider the matters that have been duly posted in accordance with the Government in the Sunshine Act. Please join me for the Pledge of Allegiance.

(Pledge of Allegiance recited.)

CHAIRMAN WELLINGHOFF: Well, we have a very exciting meeting this morning. But since our December 16th open meeting we have issued 69 Notational Orders.

Before we move to the Consent Agenda, what we are going to do this morning is we have no items for discussion that we're going to vote on, but we have a quick Consent Agenda and then we have our representatives from the RTOs and ISOs to talk about metrics.

But before we do that, and before we go to the Consent Agenda, I want to recognize Commissioner Moeller who has a comment.

COMMISSIONER MOELLER: Thank you, Mr. Chairman. I wanted to up a point. In E-5 there is a settlement. I'm not going to talk about the specifics, but the main point of it is that our Dispute Resolution Service played a significant role in bringing the parties together. In the

1 last year we've given them a little more authority, and I
2 think there was a study from the Harvard Negotiation Group
3 that said raising the visibility of the Dispute Resolution
4 Service within the Commission would be good because they
5 provide a lot of value, and are a resource for the public to
6 solve a lot of problems outside more legal channels. So
7 that is why I am highlighting the success of the DRS program
8 in getting us to E-5 today.

9 CHAIRMAN WELLINGHOFF: And something we should
10 well highlight. Thank you for that. I appreciate it,
11 Commissioner Moeller.

12 Madam Secretary, if we could go to the Consent
13 Agenda, please.

14 SECRETARY BOSE: Good morning, Mr. Chairman.
15 Good morning, Commissioners.

16 Since the issuance of the Sunshine Act notice on
17 January 13th, 2011, Item E-4 has been struck from this
18 morning's agenda. Your Consent Agenda is as follows:

19 Electric Items: E-1, E-2, E-5, E-6, E-7, E-8,
20 E-11, E-12, E-13, E-14, E-15, E-16, and E-17.

21 Miscellaneous Items: M-1.

22 Hydro Items: H-1 and H-2.

23 Certificate Items: C-1, C-2, C-3, and C-4.

24 As to C-4, Commissioner Moeller is not
25 participating. We will now take a vote on this morning's

1 Consent Agenda beginning with Commissioner LaFleur.

2 COMMISSIONER LaFLEUR: Thank you. I vote aye.

3 SECRETARY BOSE: Commissioner Norris.

4 COMMISSIONER NORRIS: Aye.

5 SECRETARY BOSE: Commissioner Moeller.

6 COMMISSIONER MOELLER: Noting my nonparticipation
7 in C-4, I vote aye.

8 SECRETARY BOSE: Commissioner Spitzer.

9 COMMISSIONER SPITZER: Votes aye.

10 SECRETARY BOSE: And Chairman Wellinghoff.

11 CHAIRMAN WELLINGHOFF: I vote aye.

12 Thank you, Madam Secretary. We have now our
13 representatives from the RTOs and ISOs. Thank you,
14 gentlemen, for coming this morning. Good morning to you
15 all.

16 I want to thank each of you for being here this
17 morning to discuss your 2010 ISO/RTO Metrics Report. Your
18 cooperation with FERC staff in the development of the
19 Performance Metrics that form the basis for this report, and
20 your work in developing the data for Metrics, is very, very
21 much appreciated.

22 In my time here at the Commission I've seen that
23 the operation of transmission systems and markets by the
24 ISOs and the RTOs provide positive benefits to consumers.
25 You keep the lights on for about 75 percent of the electric

1 customers in this country, but you also ensure that these
2 lights are illuminated by competitively priced power.

3 This report is an opportunity to provide
4 information to the public in a comprehensive way on the
5 array of values that RTOs provide. These values include a
6 reliable transmission grid; transparent, competitive,
7 efficient wholesale electric market performance; and
8 effectiveness in controlling costs in meeting the needs of
9 consumers.

10 The report also documents the role of the ISOs
11 and RTOs in meeting customers' public policy energy
12 objectives. These objectives include: facilitating
13 development of renewable energy resources; demand resources;
14 and energy efficiency.

15 These reports will be a valuable addition to the
16 information that is already available to the public. Other
17 pertinent material regarding ISOs and RTO performance
18 includes: the comprehensive financial and reporting
19 documents submitted to us for electric rate regulation and
20 financial audits; and the FERC Form One, which must be filed
21 by all jurisdictional public utilities; FERC's triennial
22 analysis of entities with market-based rate authority for
23 any ability to exercise market power; the State of The
24 Market Reports of each ISO/RTO; FERC's State of The Market
25 Report; and the various regional initiatives and performance

1 measures used by the individual ISOs and RTOs.

2 The total body of this information validates not
3 only the transparency and efficiency of these organized
4 wholesale electric markets, but also their continuing value
5 to customers.

6 I look forward to your presentations, and I
7 believe Mr. Whitley is going to introduce the report.

8 MR. WHITLEY: Thank you, Mr. Chairman, and other
9 Commissioners:

10 On behalf of the jurisdictional ISO/RTOs, I want
11 to thank Chairman Wellinghoff and the Commission for this
12 opportunity to highlight the benefits of ISO/RTOs as
13 demonstrated by the 2010 ISO/RTO Metrics Report that we
14 recently filed with the Commission.

15 As you know, the report was prepared as part of
16 FERC's efforts to develop standard measures to track the
17 performance of grid operations and power markets in ISO/RTOs
18 and in subsequently other areas of the Nation.

19 I would like to take this time to thank my
20 colleagues working so closely with me on this as an IRC
21 activity, and especially to Susan Daugherty from PJM, the
22 CFO of PJM, who was the team leader of our team that helped
23 pull all this together. It took a lot of hard work. And of
24 course we had meetings to get input from the Commission
25 staff, and our own stakeholders in the process. But I

1 especially want to thank Susan Daugherty for her work on
2 this.

3 By way of overview, I will just note that six
4 RTOs are regulated by the Commission and include the New
5 York ISO, California Independent System Operator
6 Corporation, ISO-New England, the Midwest Transmission
7 System Operator, Southwest Power Pool, and the PJM
8 Interconnection. Together, our ISOs and RTOs serve the
9 electricity needs of about 172 million people.

10 Our regions collectively include more than
11 506,000 megawatts of installed generation, and over 206,000
12 miles of high voltage transmission lines.

13 The report's measures include over 50 separate
14 metrics on ISO/RTO performance in the areas of reliability
15 and planning, wholesale electricity market performance, and
16 organizational effectiveness.

17 At the outset I would like to note two important
18 points to keep in mind when reviewing this extensive
19 information provided in the report.

20 First, the report alone does not definitively
21 measure ISO performance, nor does it supplant other
22 mechanisms already in place such as the FERC and ISO/RTO
23 State of The Market Reports, FERC's Market-Based Rate
24 Analysis, or Regional initiatives such as the Value
25 Proposition, or broader regional markets that many of us are

1 pursuing.

2 The information and the metrics support must be
3 reviewed in context with all of this other information, and
4 the regional differences that are out there among the RTOs
5 such as the state of market design in each region,
6 geographic diversity, resource mix, and proximity of load to
7 generation in the different regions.

8 As you will hear, the ISO/RTOs have found this
9 process to be most information and beneficial both in
10 reviewing our past performance, but more importantly, to
11 provide guidance for future improvements.

12 We understand that the Commission has begun to
13 engage in similar discussions with transmission providers
14 from non-RTO regions, and we stand ready to assist in that
15 initiative if desired.

16 We firmly believe that the information provided
17 in the Metrics Report reinforces the value of RTOs,
18 illustrates the transparency and value of ISO/RTO
19 operations, and demonstrates four things:

20 The ISO/RTO grids are operated reliably;

21 The organized markets are efficient;

22 The ISO/RTOs are advancing public policy energy
23 objectives; and

24 The ISO/RTOs enable demand response, energy
25 efficiency, and new technologies to be integrated on the

1 system.

2 With that brief overview, let me begin by
3 starting the reports. We're going to go ten minutes per ISO
4 in order to meet the schedule, but we have allowed
5 opportunity for questions and we would entertain questions
6 at any point that you wanted to bring them up.

7 CHAIRMAN WELLINGHOFF: Thank you.

8 MR. WHITLEY: So at this point, we will jump into
9 the New York ISO part of the presentation.

10 (A Power Point presentation follows:)

11 Just a look at the New York ISO. I'm not going
12 to cover all this that's in the materials you have because I
13 want to get into the meat of the presentation, but our
14 responsibilities are operating the grid, operating
15 competitive--fair and competitive wholesale markets;
16 planning the power system over the future; and providing
17 factual information to policymakers, stakeholders, and
18 investors.

19 I'm going to start with reliability. Reliability
20 of New York's electric system has been sustained and
21 enhanced by competitive markets. When competition was
22 introduced in New York in 1999, the markets were built right
23 up front the correct way, with a multi-settlement day-ahead
24 and real-time market for energy and ancillary services, and
25 locational pricing in both the energy and capacity markets.

1 So what that meant was, the investors saw right
2 up front that it was going to be more valuable to locate
3 generation and demand response investments, and transmission
4 investments, where the load was, where higher prices were
5 going to be. And so that served New York well.

6 So that has driven investment in generation in
7 the right places. Over 7600 megawatts of clean, combined-
8 cycle plants, and the wind power projects added since 2000,
9 80 percent of the new generation is located below the
10 critical central east transmission bottleneck, which you can
11 see in that slide that shows the state map and the dotted
12 line. So that generation was located close to the load,
13 primarily New York City and Long Island.

14 In transmission, nearly 1300 megawatts of new
15 interstate transmission capability has been added to meet
16 the needs of the Metropolitan New York Region. The Cross
17 Town Cable, the Neptune Cable, the Linden Variable Frequency
18 Transformer Project, and several other transmission projects
19 are in construction phase right now, including a new 345 kV
20 cable from Westchester to Manhattan with about 350 megawatts
21 of capability.

22 The third area where reliability has really been
23 improved is the improved availability of existing assets in
24 the fleet. Since in the competitive markets generators
25 don't get paid if they don't perform, markets have provided

1 incentive for better availability.

2 The overall improvement in New York since the
3 advent of the markets has actually given us 2400 megawatts
4 of more capacity across the peak than we had before, just
5 because they are are more available.

6 So we have this new investment in the right
7 places. We have transmission investment in the right
8 places. And we have more availability of our generation
9 assets. And then on top of that, we've attracted 2400
10 megawatts of demand response, 50 percent of it located below
11 Central East, and we now have 6 percent of installed
12 capacity from demand response in New York.

13 So what that means looking forward the next 10
14 years, when markets were brought into New York in the
15 beginning, power supply situations were very tight. The
16 Governor was actually having to get NYPA to put in peakers
17 on barges in the very beginning, emergency basis. Now we're
18 plush with capacity. We still have 1100 megawatts under
19 construction coming in the City, and we don't need
20 additional capacity for the next 10 years.

21 Part of that has been driven by the economy and
22 lower load growth, but also these investments and
23 improvements in availability in transmission and demand
24 response. So reliability looks good.

25 Energy prices: Also a good news' story based on

1 the drivers from competition. Increased efficiency is the
2 first place to start. Because we've had this investment in
3 a new fleet of clean, efficient assets in the right places,
4 that has improved the system heat rate in New York by 25
5 percent, which means it's taking less fuel to generate the
6 same amount of electricity. And as you know, heat rate
7 times fuel cost equals the marginal cost of the unit, so
8 that's driven down electricity prices in the wholesale
9 market.

10 The improved availability factor that affected
11 reliability also affects price. Because you have more
12 availability, you're better off on the supply/demand curve
13 there. The investment in the right places is also a good
14 news' story for New York.

15 If all of those plants would have located in
16 Upstate New York, you know, in Buffalo, or above the
17 Adirondacks, we would have had to build \$10 billion worth of
18 transmission to get all that down to the City. But we
19 didn't have to do that because the capacity and energy price
20 signals were in the right spot, and the generation was
21 located in the right spots, and so that saved essentially a
22 half a billion dollars a year in carrying costs for
23 transmission that would have been required.

24 So these fundamental changes have had very
25 positive results in prices in New York, saving energy costs

1 and capacity costs, and also had a pronounced positive
2 impact on the environment, as you can see from the chart on
3 the bottom right. Since it takes less fuel to produce the
4 same megawatt hours from this newer fleet that we have, air
5 quality has benefitted. Emission rates have declined by
6 double digits since 1999. SO2 rates have seen the most
7 dramatic decline, dropping 82 percent. Carbon dropping 31
8 percent. And NOX rates dropping 62 percent.

9 Congestion reduction: Competitive markets, their
10 transparency reveals problems. By having competitive
11 markets, our staffs are able to put these costs in different
12 buckets and start looking at what are the drivers? Lake
13 Erie Loop Flow surfaced as a big issue, and you see that in
14 the Metrics Report.

15 On the bottom left you can see the big bar in
16 2008 when that issue surfaced. So the transparency of the
17 markets have revealed issues. The New York ISO Operations
18 staff began a process of chasing those buckets of dollars in
19 a bucket we call "uplift." What's driving that uplift? And
20 if you see the bottom--the top--the right column graph, you
21 can see those bars that get up to hundreds of millions of
22 dollars per year. And our staff was able to find quick
23 fixes for the Lake Erie problem, but also start chasing
24 uplift all across the system looking for solutions which
25 could be in many cases an operational change, a transmission

1 fix, and now those numbers are down into the very noise
2 range. But we still follow that every day and chase
3 inefficiencies in the market, and are saving about \$44
4 million a year based on that initiative.

5 The other initiative that has really been a
6 positive thing that has come out of the Lake Erie Loop Flow
7 issue is a set of projects we are working on with our
8 neighbors called "Broader Regional Markets." That involves
9 New York, New England, PJM, the IESO, and the MISO, as well
10 as Hydro Quebec. And that is a whole set of projects that
11 we will be putting in over the next 3 to 4 years that will
12 enhance interchange scheduling, congestion management, and
13 other congestion issues by making a more efficient dispatch
14 of the broader region.

15 Dr. Patton did a study of the consumer benefits
16 of implementing all of this and it came out to be over \$360
17 million a year. So that's very high priority on our plates.
18 New York is right in the middle of it. We border all of
19 these folks, and I can tell you that my colleagues are
20 working very close with New York and with our market
21 participants all around this region to try to get this
22 done.

23 In fact, there is a huge market participant
24 meeting tomorrow between New England and New York to begin
25 the design of the rules for the pricing for the faster

1 scheduling on our Interface.

2 The third area of really positive benefits deal
3 with new investment, new technologies. Let's start with
4 renewables. Nearly 1300 megawatts of wind capacity has been
5 added in New York; another 6000 megawatts in the queue. Our
6 2010 Wind Study shows that we are ready to bring in an
7 additional 8000 with investments of around a half a billion
8 on transmission within New York.

9 Wind, as you know, brings some challenges to
10 system operations. We really attack that very well with
11 bringing in a centralized wind forecasting system back in
12 2008 that's greatly improved our ability to forecast the
13 wind day-ahead and in shorter intervals.

14 We also in 2009 integrated wind into our economic
15 dispatch so that we're able to minimize essentially what you
16 spill when you have too much wind on a transmission
17 bottleneck. It all goes through the security-constrained
18 dispatch algorithms.

19 Our wind forecasting accuracy is greatly
20 improved. The day-ahead forecasts have improved from 82
21 percent to 92 percent accuracy. And our real-time, you
22 know, short-hour-aheads have improved from 95 to 96. Those
23 are all in the Metrics Report.

24 And then another really positive story for New
25 York is the investment in new storage technologies. We're

1 attacking storage in three areas.

2 The first area where we can get a really big bang
3 for the buck is with 15-minute scheduling with Hydro Quebec.
4 So we will be able to actually change that Interchange
5 Schedule very quick, if we suddenly lose wind, or suddenly
6 pick up wind and have perturbations on the system. That
7 project will be implemented the first quarter of this year.

8 And then we have energy storage resources added
9 in New York, a 20-megawatt battery project, and a 20-
10 megawatt flywheel project that's being developed by Beacon
11 Power. Those are going in service now. And the battery
12 project is an AES project.

13 Transmission, the fourth area. As I mentioned
14 earlier, there hasn't been a large need for transmission
15 from a reliability standpoint, but we are, because we have
16 low load growth and we've had the investments in the right
17 places, now we're looking at the system in a process called
18 STARS. I came up with that acronym because all the stars
19 have to be lined up if you're going to build transmission,
20 but it actually means Statewide Transmission Assessment and
21 Reliability Study.

22 But we're actually looking at, with the
23 transmission owners, the existing system, which by the time
24 this 20-year study is done most of these facilities will be
25 90 years old, have to be replaced in kind. So if you're

1 going to replace them in kind, why not look at what could be
2 done to economically bump them up with double circuit, or
3 higher voltage, trying to stay on the same right-of-ways.

4 So we're looking at that through the authority of
5 Order 890 that you all gave us, the economic planning
6 process. We call it CARIS in New York. And the preliminary
7 results look promising, that we will be able to make some
8 investments on the bulk system in New York to help integrate
9 the wind that's in New York to the bulk system, get it to
10 the load, and move lower-cost generation from Upstate to
11 Downstate.

12 And of course New York is one of the founding
13 members of the EIPC, and so we are all branching out into
14 broader inter-regional Eastern Interconnection planning in
15 the East, and Yakout has been doing the same thing in the
16 West for some time now. So we're trying to take leadership
17 in planning not just within our state but within our region.

18 So in summary, for New York I think you can see
19 that there have been some real positive results that these
20 metrics show us in terms of competitive prices for
21 consumers, in terms of reliability, in terms of investment,
22 and you can see the major initiatives we have going forward
23 right now are primarily on the seams with our neighbors.

24 Thank you.

25 CHAIRMAN WELLINGHOFF: Thank you, Steven.

1 Colleagues, I was going to hold questions to the
2 panel until the end of the whole panel, if that's okay,
3 unless you've got a burning question for Steve?

4 (No response.)

5 CHAIRMAN WELLINGHOFF: Yakout?

6 MR. MANSOUR: Thank you, Mr. Chairman,
7 Commissioners:

8 I want to echo, first of all, ambassador
9 Whitley's point that this has been a very helpful and
10 beneficial exercise, and we appreciate the opportunity to
11 address the Commission on the topic of Performance Metrics.

12 As you aware aware, the California ISO operates
13 approximately 80 percent of California's transmission grid,
14 and oversees an organized wholesale market in which a large
15 number of entities operating in the Western Interconnection
16 participate.

17 The ISO/RTO Metrics Report addresses reliability
18 of the bulk power system, as well as the effectiveness of
19 coordinated wholesale organized markets, and ISO/RTO
20 organizations. The joint report includes the details of our
21 data related to this common set of metrics. In my brief
22 address, I will hit on the highlights.

23 But before I do that, I really want to emphasize
24 that with this exercise it is not like metrics are new to
25 us. We live by metrics. We measure by metrics. We are

1 very conscious about them, every one of us.

2 So before I do that, I want to clarify the ISO's
3 philosophies on corporate metrics in general. Annually,
4 management and the board together agree on a set of
5 significant areas to target for sustaining or improving
6 performance. We set goals, identify the necessary corporate
7 initiatives to achieve the goals, and a set of performance
8 metrics to assess our progress. That set of corporate
9 metrics translates into layers of business unit objectives
10 and a larger number of layers of metrics that cascade all
11 the way down to every individual in the organization, all
12 aligned to achieve the goals set at the corporate level.
13 Our criteria used to determine the metrics are:

14 First, they must target areas requiring the most
15 attention. Actually we pick problems to set metrics for,
16 not necessarily the stuff that we know we do well with.

17 They must be measurable and transparent.

18 We must have enough control on the variables to
19 ensure that we can achieve the goals.

20 And lastly, they must be able to influence
21 behavior.

22 If you consider the first element of the
23 criteria--which is areas requiring most attention--let me
24 give you some examples of how the California ISO has
25 tailored its metrics to meet this element.

1 Five years ago, the cost of dispatch for
2 reliability was at an unreasonably high level compared to
3 other ISOs. So we targeted this cost and used the cost
4 reduction as a metric.

5 When the ISO's Market Design & Technology Upgrade
6 Project development was the elephant in the room, about half
7 of the metrics at the time were related to successful
8 completion of that project.

9 After implementing the new market, the ISO
10 shifted focus to market quality metrics. Of course, as you
11 know, none of the other sister ISO/RTO organizations shared
12 necessarily those issues at the same time, and you wouldn't
13 expect them to have similar metrics for assessing their
14 performance at that time, either.

15 This leads me to advise you that, although we are
16 committed to report on the performance metrics at issue
17 today, these metrics, while indicative and representative of
18 a good set of common measures, are not by any means
19 inclusive of the metrics we measure ourselves by which are
20 dynamic and very different from one ISO to another. So we
21 work on both, but this particular exercise that we have
22 commonality and some of the metrics have been very helpful.

23 I also want to draw your attention to some areas
24 where we have limited data. This is because as the ISOs and
25 RTOs developed new metrics for the purpose of commonality,

1 we were at different stages of development.

2 For example, our locational marginal price-based
3 congestion management market is just over a year old,
4 compared to others who have operated this market for much
5 longer and have more data to assess trends. But that does
6 not mean that we did not measure congestion costs. It was
7 just a different metric.

8 This is just to explain that there are some
9 limitations on the data that varies from one ISO to another.

10 Now let me hit the highlights of the California
11 ISO Report:Form 552

12 First on reliability: The metrics addressing
13 reliability of bulk power system show that the ISO exceeded
14 the minimum standards for dispatch operations between 2005
15 and 2009 and realized improvements in the accuracy in
16 forecasting wind resources.

17 As you know, reliability of the bulk system is a
18 first priority among equals in the ISO's function, and we
19 all have been doing a very good job at it. I want to take
20 this opportunity, though, to highlight the challenges ahead
21 in meeting the same level of reliability performance.

22 In two years, California's renewable portfolio is
23 expected to reach about 30 percent of the state's nameplate
24 capacity. That's a nameplate capacity that would produce
25 the 20 percent energy target.

1 While we still experience 10 to 15 percent
2 inaccuracy in the day-ahead forecast of wind generation--
3 which seems to be almost a universal level in the industry
4 we've got today--you would expect that when the volume
5 increases dramatically this inaccuracy would not be
6 acceptable as it impacts performance and cost.

7 Solar forecasting is significantly more
8 challenging than wind forecasting, and California is
9 experiencing significant growth in the deployment of solar
10 generation. Therefore, the point I want to make here is
11 that maintaining the reliability performance metrics that
12 have been historically straightforward to achieve will
13 require significantly more investment on our part going
14 forward. And ISOs, by definition, are best suited to deal
15 with those issues and actually maintain reliability standard
16 under those difficult conditions.

17 Secondly, transmission planning: I want to
18 emphasize here that planning is the means, not the ends,
19 although in all debates we seem to focus on the wrong thing.
20 Every time we have an issue with transmission, we say let us
21 do planning. We do planning, planning, and again planning.

22 The purpose is really the steel in the ground,
23 not the process to plan for it. Internally we change the
24 title to just make the point and influence behavior, we
25 change the title of our planning group to infrastructure

1 development, and our corporate metrics are more related to
2 achieving approval and construction of projects, not
3 completing planning.

4 In this respect, Mr. Chairman, Commissioners, I
5 thank you and your staff for your prompt actions and
6 insightful decisions in support of the change that we needed
7 to translate plans into real projects.

8 You have adopted or approved a change to policies
9 that have been around for decades. Your capable staff
10 stepped in and facilitated several forums to close
11 philosophical gaps among the stakeholders, and you acted in
12 record time to support the state policies in this regard.

13 The report includes some measures regarding
14 transmission planning, but the measure you most likely are
15 interested in is the projects that have been approved by the
16 ISO, largely approved by your Commission for cost recovery,
17 and largely approved by the state commission for siting are
18 under construction, or far enough along to facilitate access
19 to in-state renewable resource regions to meet the 33
20 percent, the target for 2020.

21 Frankly, that is an accomplishment that wasn't in
22 my wildest dreams possible a few years ago, to actually get
23 to this point, where so much transmission has been approved,
24 and largely under construction to meet the goal that is 10
25 years from now today. In fact, in the previous 15 years to

1 that era, only one transmission, major transmission project,
2 was built in California, which is Path 15.

3 Moreover, your approval of reforms to the
4 generation interconnection process has facilitated a
5 significant volume of generation interconnection requests.

6 Third, Organized Markets: The California ISO
7 implemented a new market in April 2009, as you know, which
8 provides significant new functionality, including a day-
9 ahead market and locational marginal prices.

10 Market reform started in California in 2004 and
11 has been steadily enhanced with reforms continuing even as
12 we speak. The market has been liquid and competitive even
13 before the 2009 reform, but it is now significantly more
14 liquid and efficient.

15 All indices of prices and competitiveness showed
16 excellent trends even before the economic downturn. Our
17 challenge in the future is to maintain market efficiency and
18 liquidity with the significant change in the energy resource
19 portfolio, demand participation, change in consumer
20 behavior, and the change in the volume and type of services
21 needed from the traditional generation fleet.

22 Lastly, Organizational Effectiveness: The
23 ISO/RTO report addresses two quantitative measures--namely,
24 cost and customer satisfaction. But as you know, the
25 elements of organizational effectiveness are usually in the

1 form of three buckets: people, process, and technology.

2 People are our most valuable assets, and we have
3 several corporate initiatives and metrics to ensure the
4 effectiveness of the organization in the short term and the
5 longer term.

6 In conclusion, we will continue to work with the
7 Commission to meet the challenges and take advantage of
8 opportunities facing California and the Western
9 Interconnection, and mostly learning from each other.

10 We are at different stages, and that actually
11 provides a lot of strength and a lot of value for us in
12 communicating continuously, and obviously working on the
13 projects that we have just initiated.

14 As much as we are proud of our record, we also
15 acknowledge the challenges and the gaps going forward.
16 Metrics are usually designed to address those gaps rather
17 than calling out success or failure.

18 Thank you very much for the opportunity to
19 address the Commission on this matter.

20 CHAIRMAN WELLINGHOFF: Thank you very much,
21 Yakout. Gordon?

22 MR. VAN WELIE: Good morning, Mr. Chairman, and
23 Commissioners:

24 It is a pleasure to be here, and I look forward
25 to the discussion. I've got a half a dozen slides that I

1 will step you through fairly quickly.

2 This first slide is really just an overview of
3 ISO New England and the New England region. I'm sure you
4 are all familiar with it, so I won't dwell on it.

5 This next slide I like a lot because it's kind of
6 a report card on one slide on wholesale market and system
7 planning in the region over the past decade or so. On this
8 slide you see the cumulative investment in infrastructure in
9 the region over the past decade.

10 The orange bars represent investment in new
11 generation. And you will see that over the past 10 years or
12 so we have had investors commit to 14,000 megawatts of new
13 generation in the region, most of it being pretty clean and
14 efficient gas-fired combined-cycle.

15 The green bars represent investment in DR in the
16 region. And from a base of almost zero back in about 2000-
17 2001, we through our last auction have procured almost 10
18 percent, just a little over 10 percent, of installed
19 capacity requirement of demand resources.

20 The black line on the chart represents the
21 cumulative investment in transmission. And as of the end of
22 2009, we had roughly \$4 billion worth of new transmission
23 that had been put in service in the region, with another \$5
24 billion in the pipeline. And since the end of 2009, a large
25 chunk of that \$5 billion is actually moving forward into

1 construction. So I think this is a huge success story.

2 I think it is quite remarkable, that slide, if
3 you think about what's been achieved in the region through
4 wholesale markets and regional system planning in the past
5 decade.

6 Of course infrastructure investment has positive
7 benefits. And this slide really speaks to some of those
8 benefits. They're both economic benefits as well as
9 environmental benefits.

10 We've almost eliminated congestion in the region.
11 There used to be significant congestion in areas like
12 Connecticut, and in Boston. Of course the transmission
13 infrastructure has helped relieve that. It's also helped us
14 reduce the congestion, the uplift costs for other merit
15 commitments in the region.

16 And we see a positive trend in terms of wholesale
17 electricity prices as well when you adjust for fuel costs.
18 Of course fuel costs are still the biggest driver of
19 electricity costs at the wholesale level. But when you
20 factor out those fuel costs, you see the impacts of a more
21 efficient fleet in the transmission system improvements.

22 And finally, we've seen dramatic reductions in
23 SOX, NOX, and CO2 in the region over the past decade. And
24 that's the result of the cleaner machines that we have on
25 the system, as well as obviously the investments the region

1 has continued to make in renewable energy, which I will
2 speak to on the next slide. So I think that's a very
3 positive story, as well.

4 Looking at the issue of resource performance, if
5 you stand back and look at generator availability, there was
6 a big step up from the 1990s into the next decade of around
7 10 percent improvement in generator availability, driven by
8 the incentives in the wholesale market. Since that big step
9 we've seen sort of modest improvements from 2005 to 2009,
10 about a 1 percent increase in generator availability.

11 Our capacity is adequate today. We are in a
12 surplus situation right now, but we a little troubled by a
13 large portion of our fleet which we think is susceptible to
14 retirement in the reasonably near future. About 25 percent
15 of our fleet is based on oil-fired generation that was built
16 in the '50s, '60s, and '70s. Oil is obviously a lot more
17 expensive than natural gas. So these units don't run any
18 more, or they run very seldom, and these units are also more
19 susceptible to some of the new environmental regulations
20 that are being brought forward.

21 So we do expect to see some turnover in this
22 portion of the fleet, and that is going to present us with
23 some reliability challenges.

24 With respect to DR, as I've mentioned we've seen
25 a dramatic growth in DR within the region. That has brought

1 with it a number of operational challenges. We have
2 invested in a lot of infrastructure between our control room
3 and demand aggregators within the region so that we can give
4 the operators real-time control and feedback of DR from the
5 control room. And we implemented that in June of this past
6 year. That's worked quite well.

7 And this coming year what we will be doing is
8 giving the operators more granular dispatch by dividing the
9 region up into 19 different dispatch zones. So if you have
10 a problem in Connecticut, we don't have to turn on a DR
11 resource in Maine.

12 Having said all of that, we still see some
13 challenges. We were a little troubled by the inconsistency
14 of resource performance during summer 2010. That statement
15 applies to both generation and DR. So we want to go back
16 and look at our market rules in terms of the incentives and
17 penalties for resource performance. So that is something we
18 would like to work on with our stakeholders.

19 And the whole issue of system flexibility. We
20 lost a large pump storage unit that was out of operation for
21 most of the summer, and that exposed some of the performance
22 issues in the rest of the system.

23 And then as we look to the growth in DR, one of
24 the things we are realizing with this implementation we've
25 done recently is that we need to go further. And one of the

1 things we want to do is to have DR integrated into the
2 security-constrained economic dispatch; have the dispatch of
3 DR be automatic, and have it be dispatched in economic merit
4 order. And we think that is an important next step that we
5 need to take.

6 Renewables have been increasing, increasingly a
7 large part of the New England mix. About 13 percent of our
8 energy comes from renewable resources, and that is not
9 counting the imports from Canada which are substantial,
10 because most of the states, in fact all five of the states,
11 with the exception of Vermont, do not treat large-scale
12 hydro as renewable. Montreal simply changed their position
13 on that.

14 Wind capacity is fairly minimal in New England
15 today, about 3- to 400 megawatts of wind on the system.
16 There's great interest in building wind in the region. We
17 have more than 3,000 megawatts of wind in the queue. And as
18 a result, we've done a series of studies to quantify what
19 the implications will be for the region.

20 The first was a study we did for the New England
21 Governors to look at what the transmission implications
22 would be. And, no surprise, they are fairly substantial.
23 And that's probably one of the big barriers to sort of
24 driving further wind--or getting more wind onto the system.

25 And then the other study we did, we commissioned

1 GE and were able to learn from the experiences of our
2 colleagues from ERCOT, California, and Midwest ISO and so
3 forth, and what we did was to do an extensive wind study for
4 New England to understand the operation implications of
5 large-scale wind penetration in the region. And there are
6 some very good recommendations coming out that study which
7 we intend to implement.

8 The next slide, to Yakut's point about metrics
9 driving behavior, I think illustrate the point quite nicely.
10 We were not happy in the middle part of the last decade with
11 the quality of the bills that we were issuing. So we
12 created an initiative within the organization to do two
13 things, which first was to drive improvement in the quality
14 of our bills. And the second was to reduce the settlement
15 period in the marketplace.

16 The chart on the left basically shows the number
17 of errors in the initial bill that are issued by the ISO
18 before we go through the resettlement period, and you can
19 see we've driven it up to an accuracy level of about 99.8
20 percent over the last five years.

21 The same positive trend is there in terms of the
22 settlement side of things. We have reduced the settlements
23 down to a couple of days for the day-ahead market, four days
24 for the real-time market, and very shortly we intend to sort
25 of reduce that probably by another 50 to 60 percent. So

1 we're looking to try and have that settlement cycle as short
2 as possible.

3 Looking forward, this final slide is really just
4 a bit of a to-do list for us and for the region. We can't
5 do this on our own. We have to do this in conjunction with
6 our stakeholders. It's not an exhaustive list, but it does
7 relate to some of the things I showed you on the previous
8 slides and tends to be some of the issues at the forefront
9 of our mind.

10 We've recently started a discussion with our
11 stakeholders on the work plan and the priorities for the
12 region. And I'll just skim through it fairly quickly. I've
13 mentioned the integration of DR into the real-time dispatch
14 and the issue around resource flexibility and performance.

15 We are going to have to deal with this issue of
16 the retirement of the oil-fired generation in the region.
17 We've clearly got work to do with regard to implementing the
18 recommendations from the wind study, and we have agreed to
19 support our regional state committee NESCO, with their
20 procurement process for more renewables on the system.

21 I've mentioned that we will continue to make
22 improvements in the billing side of things and customer
23 service. Steve mentioned that we're working together on a
24 number of SEAMS projects. The one that comes up first is
25 this issue of further optimizing interchange flows between

1 New England and New York. So that is going to be a fairly
2 large project.

3 And then of course we have to finish the work
4 that we've started with regard to the reliability projects.
5 And I'll stop there.

6 Thank you.

7 CHAIRMAN WELLINGHOFF: Thank you, Gordon. We
8 appreciate it very much. John?

9 MR. BEAR: Thank you, Mr. Chairman, and Fellow
10 Commissioners:

11 It is wonderful to be invited to visit with you.
12 We appreciate that. And I would echo the comments of my
13 colleagues. I think that the process we've gone through in
14 looking at the measures and metrics has been very useful to
15 us, both collectively and individually.

16 Just to put the Midwest ISO in context, we cover
17 13 states and one Canadian Province. We serve about 45
18 million people, about 57,000 miles of transmission lines,
19 144,000 megawatts of generation, and about \$23 billion in
20 gross market charges on an annual basis.

21 As we stepped back and took a look at our
22 principles, we really tried to line them up with the RTO
23 principles laid out in FERC Orders 888, 889, 2000, and 890;
24 the GAO principles, which are largely track value creation
25 using standard methods; and provide broad transparency of

1 RTO operations and performance.

2 And then we looked at our own practices to see
3 what we were doing and how we were communicating those
4 things. And really from a Midwest ISO standpoint, our
5 vision is to drive value creation through efficient
6 reliability using market operations, planning, and
7 innovation. And we capture that on two dimensions.

8 One, we have broad market transparent reporting.
9 Everything from hourly reporting, to monthly reporting, to
10 annual market reports on process, procedures, our
11 performance; frequent and granular pricing; and all those
12 kinds of things: customer satisfaction. They are all
13 produced. They are posted on our website. They are made
14 public, and we share those with our stakeholders.

15 But we stepped back from that and said: So what?
16 What does that mean to us? Are we actually creating value
17 on a reasonable basis with the market operations that we
18 have in place?

19 And so we look at what we call our value
20 proposition. What this does is gives us a scorecard
21 externally as to how we are doing. So these are measures,
22 and I'll go from left to right just talking about them,
23 around improved reliability within the first bar. The
24 efficient dispatch of energy, or the production cost savings
25 of having a market dispatch across such a broad region and

1 such a broad scale.

2 Unloaded capacity. Regulation and spinning
3 reserves, which really goes with the ancillary service
4 markets that we implemented two years ago. And, for
5 example, there what you'll see is those are 12-month
6 trailing numbers looking at the reduction of approximately
7 800 to 600 megawatts of ancillary service requirements that
8 are there. So it's just a lot more efficient to do things
9 on a broad market basis. And we're tracking that and
10 looking at that.

11 Integrating wind. We've got about 9,000
12 megawatts of wind capacity and renewables on our system
13 right now. That's going to be moving to about 25 gigawatts
14 in the next 10 years. So we do have quite a bit in front of
15 us. But what we've seen is, having such a broad market
16 footprint and dispatch really allows us to do that a lot
17 more efficiently than it would be done on an individual
18 state-by-state basis.

19 The next series of benefits is around generation
20 investment deferrals. Demand response implementations. And
21 then finally you can see our costs. And so we look at it
22 and track it on this basis, looking at \$1.2 to \$1.6 billion
23 of annual value being created across our footprint.

24 The next bar just backs out the generation
25 investment deferral pieces and looks at what is adjusted

1 there. So again, \$650- to \$870 million of benefit being
2 created.

3 We look at this externally, but it has also been
4 very helpful to us internally. So measures and metrics, as
5 some of my colleagues have talked about, can drive behavior.
6 And what we do is, we really look inside our organization to
7 the outside and ask our employees: What are you doing that
8 connects with this value we're creating here? So it has
9 been very valuable to us internally as well.

10 A piece that is sort of conspicuous by its
11 absence here is transmission planning. We haven't captured
12 transmission planning in a discrete bar. However, I will
13 tell you, if you go from the left to the right, each one of
14 those bars is enhanced to the extent that we're able to
15 increase the transmission capability on our system.

16 Obviously it has to be the right transmission,
17 and we have to do it in an appropriate way, which we're
18 doing with our planning and now our cost allocation, but
19 what you will find is we've got \$600 to \$800 million a year
20 of congestion that happens inside to Midwest ISO. So to the
21 extent that we are able to build out that transmission grid,
22 we can relieve that congestion and you will see the bars on
23 the left side of this chart will increase. So that sort of
24 ties it altogether for us.

25 The stakeholder input is very valuable to this.

1 To quote some of our stakeholders: The best thing about the
2 Midwest ISO is the stakeholder process. And the most
3 frustrating thing about the Midwest ISO can be the
4 stakeholder process. But it is very valuable to us.

5 The chart that I showed you previously we go over
6 two to three times a year with our stakeholders. We go over
7 it at a pretty granular level. And the chart is really a
8 reflection of not just the Midwest ISO's view on those value
9 creation metrics, but also our stakeholders' views.

10 There is a website where you will see the chart
11 that I just showed you. You can click on any bar on that
12 website and get down to any level of granularity that you
13 would like to to see the methodology used to calculate the
14 estimate, all the different studies and estimates and things
15 that we do. You can see them right there, so you can track
16 all the numbers right back to ground level that roll them
17 up. So there's multiple reviews, and we have a lot of good
18 input from our stakeholders.

19 So, for example, on improved reliability, this is
20 just to illustrate to you. You could click on that bar
21 within our website and you could be able to see all of our
22 estimates and all the supports for those estimates that are
23 there. And it is a reflection again of both the Midwest
24 ISO's views, as well as what our stakeholders are looking
25 at.

1 So broad market reports, you can see here
2 illustratively what we've got. There are market operations
3 reports. There are independent market monitor reports, and
4 state of the market reports that happen on an annual basis;
5 pricing and settlements, some of the things my colleagues
6 have gone through.

7 You can see in detail our business practices, our
8 processes, and our procedures. And then you can see our
9 transmission planning documentation and the work that goes
10 on there.

11 So in summary, we feel like we have exceeded the
12 GAO principles. If you look at track value creation, and
13 you look at the broad transparency of RTO performance, we do
14 feel like the value proposition captures that.

15 And then to the extent that one wants to see all
16 of the detail in the market operations at any discrete level
17 they would want to see, we feel like the reports are there,
18 the metrics are there, and folks can see them, and they are
19 transparent.

20 And with that, I would just like to thank you for
21 the opportunity and I look forward to any questions once the
22 presentations are concluded.

23 CHAIRMAN WELLINGHOFF: Thank you very much, John.
24 I appreciate it. Nick?

25 MR. BROWN: Well good morning and thank you for

1 the opportunity to have this conversation about the value of
2 our respective organizations.

3 Southwest Power Pool serves an area of all or
4 parts of nine states with a mission statement, a very
5 important mission statement, of helping our members work
6 together to keep the lights on today and in the future; and
7 tracking metrics is all about our keeping ourselves
8 accountable to living up to that particular mission.

9 I learned a long time ago that everything that
10 can be measured doesn't matter; and everything that matters
11 can't be measured. So in the Metrics Report, and in our own
12 internal metrics, we track both quantitative and qualitative
13 value of the organization and of all the services that we
14 provide our various members.

15 I want to talk about those that are included in
16 your report in the context of our strategic plan, but please
17 understand that the metrics in the report before you is but
18 a subset of the metrics that our board of directors and
19 members committee review each and every board meeting. And
20 then at the end of the year, we spend an entire board
21 meeting reviewing the metrics for the previous calendar
22 year.

23 So our strategic plan. Three primary
24 initiatives. The first: To build a robust transmission
25 network. Our goal is to turn the transmission network into

1 an enabling asset. That is something that it has not been
2 in our region for any number of decades, and that is our
3 goal.

4 In working with our regional state committee we
5 have tackled one extremely important issue. The problem for
6 decades has not been the planning process; the problem has
7 been the cost allocation for the facilities that are
8 identified in the planning process, and working with the
9 regional state committee we've over the past few years, and
10 most notably this last year, tackled how to allocate cost
11 for economic upgrades across our footprint; facilities that
12 are needed to turn the transmission network into a robust
13 network, an enabling network, and then allocate those costs
14 in an equitable way across the footprint.

15 And I can't let this opportunity pass by without
16 thanking each of you for your support in that filing. We
17 are moving forward. We have approved a balanced portfolio
18 of transmission projects, a set of priority projects, moving
19 forward quickly with those. And, while we do have many
20 metrics, the approval of these particular projects and the
21 issuances of notices to construct on those projects has
22 brought yet another important issue to bear: that of
23 estimating costs on the front end, and then tracking those
24 costs throughout the construction project.

25 We have noted in the last three or four months

1 variances of costs, both up and down, on certain projects.
2 But the concern being that we need more robustness in the
3 cost estimation phase and the tracking of those costs
4 through the notices to construct, and then ultimate
5 construction of those facilities and placing them in
6 service.

7 So we have an opportunity for yet another metric
8 in our organization, and our metrics continue to be a work
9 in progress.

10 Our strategic planning committee has immediately
11 jumped on this particular need, and we will have a report in
12 front of our board of directors next week on steps to better
13 track--first, better estimate, and then better track costs
14 for these initiatives going forward.

15 Then we took on revamping our transmission
16 planning process, to look past the end of our nose in
17 constructing this robust network. Our focus in the past has
18 been mostly on near-term. Now we have a transmission
19 planning process iterative over a three-year period that
20 looks at a 20-year-out need, a 10-year-out need, and then a
21 closer-in need. And again, I thank you for your affirming
22 action on that new transmission planning process in this
23 year.

24 So first initiative: Build a robust transmission
25 network.

1 Our second initiative is to continue to enhance
2 our wholesale markets. The implementation of our energy
3 imbalance service market, our real-time market many years
4 back continues to prove to be a wonderful asset and tool for
5 our members. It has enabled us to reliably manage the vast
6 amount of wind interconnecting in our system. That variable
7 resource and the ability of our EIS market to manage that
8 has proven wonderful. And in fact we, since the
9 implementation of that market, we've more than doubled the
10 amount of wind capacity in our footprint.

11 So we are continuing based on the blood, sweat,
12 and tears of those who have gone before us in implementing
13 day two markets. Our members are moving forward with
14 consolidating our balancing authorities, with implementing a
15 day-ahead, unit commitment market; operating reserve market;
16 and a congestion hedging market.

17 So we are learning from each other. I again have
18 to express appreciation for those who have gone before us.
19 We have learned much from their blood, sweat, and tears.

20 And then the third prong of our strategic plan:
21 Adding member value. This is one area where we do have very
22 quantitative metrics. Part of our value proposition is
23 being a member-driven, relationship-based organization, and
24 these three metrics bring that to bear.

25 The first is on customer satisfaction. And over

1 the past four years that customer satisfaction level has
2 been high and continues to increase. And this very last
3 year exceeded the "very satisfied" threshold in our
4 footprint.

5 A second metric, one of which I am most proud of,
6 is that in the last five years, since the beginning of 2006,
7 we have submitted to this Commission 1154 filings. Of those
8 filings, there were only 74 protests, and of all of those
9 filings, only 1 was set for a paper hearing. I think that
10 is a true testament of the value of bringing our members
11 together in a collaborative fashion and engaging them in all
12 of the difficult issues that face us.

13 And the last metric: We added seven members last
14 year. A voluntary organization, we added seven new members
15 to our organization.

16 And then last but not least, and a question that
17 I know is before each of you, and probably the reason why
18 we're all here today: What's our impact on the end-use
19 customer?

20 Within our footprint on the average bill within
21 our nine-state footprint for 1,000-kilowatt hour customers
22 is about \$100 a month. And of that bill, we account for 30
23 cents of that \$100 bill. On the value side of the equation,
24 just considering the quantitative metrics in an extremely
25 conservative approach, the value is ten-fold. Again, just

1 considering the quantitative, the value is ten-fold. And
2 that is a very conservative calculation.

3 So three prongs of our strategic plan:
4 Build a robust transmission network;
5 Continue to enhance our wholesale markets;
6 And add member value.

7 And we are focused on continuing to add member
8 value. In fact, we have a whole division of our staff under
9 Michael DeSole focused on process integrity, tracking member
10 value, creating more member value, and we will deliver more
11 than what we are today in the future.

12 So if there is, in closing, a metric that I would
13 want you to hold us accountable to, that's accomplishing
14 that strategic plan. I look forward to the questions.

15 CHAIRMAN WELLINGHOFF: Thank you very much, Nick.
16 Appreciate it. Terry?

17 MR. BOSTON: Thank you, Mr. Chairman, and
18 Honorable Commissioners:

19 Being last here, I hope to make this fun and
20 exciting, or at least exciting.

21 (Laughter.)

22 MR. BOSTON: The information in the first
23 Metrics Report reinforces the transparency of RTOs and PJM's
24 commitment to accountability to the 660 members and the 54
25 million people we serve in our region.

1 The following slides that I am going to show you
2 represent only a very small subset of those metrics that are
3 in the more comprehensive report. But just a touch of
4 history.

5 Back in 1927, PJM was formed when three utilities
6 went together and said: Wouldn't we be better off if we
7 could do an optimal dispatch over a larger area using more
8 generation resources and optimize the transmission
9 connection between those three utilities to get more value
10 for the people of the region we serve?

11 Eighty-three years later, for 660 members and
12 165,000 megawatts of connected generation, this is just as
13 true today as it was in 1927. PJM has 165,000 megawatts of
14 connected generation, about 6,000 substations that we
15 control, making us the largest grid operator in North
16 America, and we cleared \$33 billion last year through our
17 markets, up from \$26.7 billion, making us the largest market
18 operator in the world.

19 We are laser focused on three things that have to
20 be done quite well.

21 Number one, and most important, is reliability.
22 If we don't do that well, if we don't keep the lights on,
23 nothing else matters.

24 Number two is fair and efficient markets that
25 produce competitive, low-cost results that are transparent

1 to all our members.

2 And last is infrastructure planning for our
3 future.

4 Those three things support each other. The first
5 slide on metrics that I have here is focused on the
6 transmission planning aspect. The PJM Board and our
7 stakeholders through our Transmission Expansion Advisory
8 Committee, has approved \$19 billion of new transmission.

9 To Yakut's point, I think it is very clear that
10 planning is much easier than building transmission lines.
11 So getting steel in the ground and wire in the air is very
12 important to us.

13 The five EHV lines on this map represent about 30
14 percent of the cost of the projects, and there's over 3,000
15 upgrades in our transmission expansion plan to the system.
16 They will yield tremendous benefits for the people of the
17 PJM region.

18 Two lines are highlighted here in green, that
19 being the Trail Line and the Carson-Suffolks Line, are under
20 construction and ahead of schedule. They will be in place
21 and will greatly beef up the power supply around the
22 Washington, D.C., Northern Virginia, Maryland area for this
23 summer's peak. Getting those will make Mike Kormontz, our
24 head of operations, sleep a lot better at night.

25 The one line in the north part of our system,

1 Susquehanna Nuclear Plant, over to northern New Jersey, that
2 line has been approved by both states and we are awaiting
3 DOI's environmental impact statement and looking forward to
4 working with the Commission to try to accelerate that
5 because of its importance to northern New Jersey.

6 Two lines that are in hearings, siting hearings,
7 right now are the Path Line that comes from West Virginia
8 across the Allegheny Mountains that will enable wind and
9 capacity resources to come across the Allegheny Mountains to
10 the Mid-Atlantic, and ultimately could enable offshore wind
11 to flow in the other direction.

12 And the Map Line that crosses the Chesapeake Bay
13 onto the Delmarva Peninsula. Both those are in the hearing
14 processes that we have.

15 Those five lines are required for reliability,
16 but the economic benefits are huge. The reduction in
17 congestion cost per year, the annual congestion cost
18 reduction, is about \$1.7 billion. And the reduction in
19 capacity cost is about \$3 billion from having those lines
20 built, primarily getting transfers into the load centers
21 that are along, if you think about it, 53 percent of the
22 population lives within 100 miles of the Coast.

23 So the next slide kind of emphasizes the
24 reliability and generation interconnection. During the
25 five-year period, we have studied 1100 generators to connect

1 to the PJM system. To put that in perspective, there's only
2 1310 generators represented in that 165,000 megawatts that's
3 already connected.

4 Thanks to Kevin Kelly--and I don't see Kevin here
5 today--but my first week on the job, I called Kevin and I
6 said: Sequential won't work, with the number of generators
7 we have to connect to our system in the queue. And we
8 worked through a process to in essence cluster those. So we
9 have reduced the time to do the studies by 50 percent, at
10 the same time we have increased the number of annual studies
11 we are doing by a factor of 3. So that is a six-fold
12 improvement in the performance of interconnection studies,
13 and we will continue to work to lower the backlog and reduce
14 the time of the generation.

15 The next slide I wanted to talk about is markets
16 have been very good for renewables and for demand-side
17 resources in the PJM System. Demand-resources have grown,
18 as shown in the slope of the two lines on this slide. In
19 fact, in the spring of 2010, in May of 2010, we cleared
20 10,000 megawatts of demand resources in our RPM Capacity
21 Market. About 700 megawatts of that was energy efficiency.
22 This compared to 2,000 megawatts we had in 2007 before we
23 had the RPM Capacity Market up and running.

24 If you think about it, we worry about performance
25 and how you measure and verify that. So I thought we needed

1 to apply a forced outage rate much like you do to a
2 combustion turbine, or a coal-fired unit, to demand
3 resources.

4 In the fall of 2009, we did an announced test.
5 And there are pretty severe penalties if you don't perform.
6 We got 118 percent of what we asked for. So we did a drill
7 in the summer of 2010. We did it for real. We called for
8 2,600 megawatts, mostly here in the greater Washington,
9 D.C., area. We called it by zip code. We got 99.8 percent
10 of the demand resources that we called for on that actual
11 hot day with a 765 line outage across the mountains.

12 PJM is committed to working with our members and
13 states to continue to grow this. The key is in the price
14 responsive demand and shortage pricing, the states have been
15 very supportive and we will be back at FERC working to
16 expand what we are doing in that area.

17 Clearly, smart meters and measurement and
18 verification have got to be a part of that demand resources
19 that we're putting in place. One of the problems we had,
20 last summer it took us six weeks to know that we got 99.8
21 percent of what we called for through the billing cycles of
22 the revenue, the retail revenues.

23 The cost slides kind of speak for themselves.
24 I'll just touch--and I'm on slide number six in your package
25 there. The top line is the energy cost. The energy cost is

1 very much driven by fuel costs across the system. As you
2 can see, fuel costs have dropped. But if you take out the
3 impact of the fuel costs in the five-year period that's in
4 the Metrics Report, our load weighted LMPs, fuel cost
5 adjustment--fuel cost adjusted as verified by our
6 Independent Market Monitor, have dropped from \$30.45 per
7 megawatt hour to \$21.46, without the impact of fuel costs.
8 And those numbers have been verified by Joe Biering our
9 Independent Market Monitor.

10 What are we doing next? What can we do for our
11 customers in lowering costs and improving performance across
12 the system?

13 I love the title of what we call this. It's
14 called: "Perfect Dispatch." You can see from the line to
15 the left, each day after we perform our operation we look
16 back at the previous day with 20/20 hindsight. Instead of a
17 weather forecast, we know what the loads were.

18 Instead of a E-4, Equivalent Forced Outage Rate,
19 on our generating plants, we know the availability of the
20 generator plants. Instead of the Constrained Model
21 Transmission System, we know what the flows and the loop
22 flows are across the system. And we say, quite disciplined,
23 how do we compare to an optimal dispatch of what happened
24 yesterday with the actual 20/20 hindsight?

25 By doing that, we have improved our performance.

1 If you look at the curve through the 2009 period, we have
2 saved the customers about \$122 million. If you look at
3 through 2010, we have saved the customers the equivalent of
4 our annual cost of operating the PJM. And much like Nick's
5 numbers, we see the cost of running PJM versus the benefits
6 provided is in the 8-to-1, 10-to-1 ratio level.

7 There are other things we are working on. Let me
8 touch on those. The metrics pointed out, our peers here at
9 the table have a little better availability than we do on
10 our control systems. We are putting in an advanced control
11 system with dual primary controls so an operator, wherever
12 they show up, if they log in with the credential at
13 redundant locations, they can control the system. It's
14 state-of-the-art with shared architecture bus across the PJM
15 control functions.

16 Storage and regulation, the EPRI study says that
17 we need to double the amount of regulation that we have on
18 the system to integrate the wind. I am very anxious to hear
19 from Joe Eto here in a minute on the wind integration study
20 that FERC has done. Joe, I'm anxious to see what PJM can do
21 and some of the innovation we've been trying to do with load
22 frequency control and storage.

23 Credit risk management. We implemented the
24 approved PJM Settlement, Inc., on January 1. It's the last
25 major step we have in improvements in our credit risk

1 management.

2 In closing, kind of batting cleanup for the
3 group, if you look at the three Cs, Communication,
4 Coordination, and Collaboration, that is what the RTOs are
5 very much about. The ISO/RTO communication is in near real-
6 time communication with the generators and the consumers
7 that are using electricity, the larger consumers that are
8 using large--instantaneously with when it's generated.

9 We are constantly coordinating with our
10 transmission owners in terms of the transmission system and
11 configuration we have. And we have to collaborate
12 transparently with our members, with the stakeholders, and
13 with every part of the industry.

14 In operations markets, planning, and even in
15 policy development we are in concert with the states and
16 FERC with those CCCs. ISOs have worked very closely
17 together here in collaboration to perform these metrics and
18 put the report together. It is really the commitment to the
19 CCCs of Communication, Coordination, and Collaboration with
20 each other and the entire industry that has made us
21 successful, and I look forward to your questions.

22 CHAIRMAN WELLINGHOFF: Thank you very much,
23 Terry, and gentlemen, all of you.

24 Terry, it has been fun, and it is exciting. It
25 is extremely exciting. In fact, I had a conversation

1 yesterday with Commissioner Moeller about your presentation.
2 Phil said to me, well, the presentations we're going to have
3 tomorrow are the most important presentations before this
4 Commission that we've had since he and I have been here.
5 And he was absolutely right. These are the most important
6 presentations.

7 I just can't tell you how proud I am of all of
8 you. I can't tell you how pleased I am with the work that
9 each one of you are doing. What you have really done is you
10 have validated the premise on which I came to this
11 Commission. That is, that efficiency is good. And you are
12 all doing efficiency every day in every way with respect to
13 these wholesale markets. And you are proving for consumers
14 that there are benefits from these wholesale markets. And
15 by doing that, that is how we are going to drive consumers
16 into these wholesale markets. And now we are also going to
17 continue to drive down costs for consumers through
18 efficiency.

19 So again, I want to thank you all. I really do
20 appreciate what you are doing.

21 I do have a couple of questions, and then I will
22 turn to my colleagues. As you all know, as one CEO said to
23 me when I first came to the Commission, I didn't come here
24 just to occupy a seat. So we're not going to stop on where
25 we are. You are driving ahead with initiatives that I am

1 very excited about.

2 One thing I read about that you touched on in
3 your presentation some, Steve, and you and Gordon are
4 working on this, and I know that this going on just not
5 between New England and New York, but, Steve, if you could
6 elaborate a little bit on the initiative of the white paper
7 of looking at seams between New York and New England, and
8 that transmission interface, efficiently scheduling loads.
9 I know that in that white paper and the reports I saw the
10 Market Monitor did a backcast from 2006 to 2010 and said if
11 you had more efficiently scheduled you could have saved \$784
12 million. And so I'm very excited about the prospect of
13 moving forward with that.

14 So if you could expand upon that, and then any
15 others of you that I know are looking at doing similar
16 things on your seams to improve efficiency there, I'd like
17 to also hear about that, as well.

18 MR. WHITLEY: Thank you, Mr. Chairman. That is a
19 really important piece of a set of projects that we call
20 "broader regional markets." We kind of border a lot of
21 people. We border New York. We border PJM. I mean, we
22 border New England, PJM, IESO, and Hydro Quebec. And
23 certainly our operations between us and MISO impacts each
24 other, too.

25 So this whole group has been working together on

1 a number of projects to try to get the power to flow in the
2 right direction and prove the scheduling on the system, to
3 be more flexible in scheduling so we can handle more wind
4 and renewables, and also reduce costs.

5 So one of the first projects for New York is
6 going to be the faster scheduling with Hydro Quebec in the
7 first quarter. And the first market interface is doing to
8 be pretty close to the same, New York and PJM.

9 We've had our market design folks working
10 together on this for now like 18 months--Andy Ott, and Bob
11 Ethiere (phonetic), and Ronna McCurgey (phonetic), and each
12 ISO has a really senior person, and some troops underneath
13 that have been working on this. So there's a lot of meat on
14 the bones here.

15 And one of the first design questions is how to
16 set up the pricing rules to get the power to flow the right
17 way. And so we've worked collaboratively with New England
18 to develop a white paper on a couple of alternatives to do
19 that. One is called "Tie Optimization" and the other one is
20 called "Spread Bidding."

21 Essentially they both theoretically could get you
22 toward the same place, but they operate a little
23 differently. So we're going to take that through the
24 stakeholder process to get the pros and cons evaluated. And
25 the two ISOs, including their boards, have all agreed that

1 they're going to support this and add the resources to make
2 it happen.

3 And then my goal is to get this standardized kind
4 of around the horn with New York. I don't want to see us do
5 it one way with New England, and do it a different way with
6 PJM. And so I'm trying to make sure that I've got New York,
7 New England, PJM, and MISO in the loop on this. And they're
8 looking at the same thing between their interfaces.

9 So it's very promising. But the whole set of
10 projects, that's one piece. There's congestion management
11 pricing. And then there's buy-through of congestion. We're
12 working on all of them to really make a more efficient
13 dispatch of the broader region, which adds a tremendous
14 amount of value to consumers.

15 I don't think I've worked on anything in my
16 career that has that much annual value. So I mean it
17 clearly is a high target for us to go after.

18 CHAIRMAN WELLINGHOFF: Literally billions of
19 dollars in savings a year.

20 MR. WHITLEY: Yes, yes. So FERC helped us with
21 an Order on the Lake Erie Loop Flows that said, go do this
22 or we will. And I took that Order and went around to see
23 John, and Terry, and Gordon, and Paul Murphy, and got a
24 commitment from them to work together to get this done. And
25 we've actually had our boards meet together on this several

1 times. So it's a very high priority from the highest level,
2 and now we've got it going through the stakeholder
3 processes, too.

4 So let me hand it over to the others to comment.

5 CHAIRMAN WELLINGHOFF: Very exciting. Gordon, or
6 John, or Terry?

7 MR. WELIE: I just support one thing that Steve
8 said, which is to the extent that the solution we come up
9 with could be extended, it would be very helpful. I think
10 it would be efficient. So it would be an opportunity sort
11 of not to sort of try and solve the problem three different
12 ways across the country. So I would recommend folks to read
13 the white paper we've put out to our stakeholders and let us
14 know what you think.

15 MR. BOSTON: Let me add. One thing that we've
16 done in particular is planning across the seams, New York,
17 and PJM, and have worked together on joint planning studies
18 across the seam.

19 I met with John in Indianapolis yesterday about
20 the Midwest ISO. We see as they bring up their capacity
21 market that our two capacity markets will converge, just
22 like our energy markets. The prices at the seams will
23 converge. So I think we're making good progress. We have
24 meetings set up next week with our Market Monitors to talk
25 about a schedule to make things happen on the New York

1 border. So I think we're making good process and progress
2 on the seams.

3 CHAIRMAN WELLINGHOFF: Tremendous. John?

4 MR. BEAR: I think it really emphasizes to all of
5 us how interdependent we are, and how much impact one can
6 have on another. And so I think the process that Steve has
7 started, and Terry and I and others are carrying through,
8 will even bring another big bucket of value, if you will, to
9 the end users.

10 Because to the extent that we can coordinate
11 better, it does make a big difference.

12 CHAIRMAN WELLINGHOFF: Thank you, John.

13 If you could, I wanted to thank you for your
14 comment on work with FERC and our staff on getting that
15 transmission done, to get your 33 percent renewable goal
16 achieved. As you said, you thought a couple of years ago
17 you had never thought you would get there, but with the
18 transmission it can be done.

19 And again, hopefully the tool that Joe Eto is
20 going to talk about is an additional tool that you can use
21 to ensure how you can incorporate this 33 percent into the
22 system. So I hope you get an opportunity to hear Joe's
23 presentation.

24 But I would like to have you also comment, I know
25 you haven't been sitting idle, either. I've been reading

1 some things that you've been doing with Bonneville to try
2 to work with, you know, not just across RTO seams, but from
3 RTOs to non-RTO areas as well to help better integrate and
4 improve efficiencies, and improve wind integration.

5 Maybe you could comment on that, as well.

6 MR. MANSOUR: We had forums in the West, again in
7 a collaborative nature among the ISOs, in the absence of
8 other ISOs. It was not hard to really get people to think
9 around the issues. The principals are putting a lot of time
10 into it.

11 We all appreciate that the times are different.
12 The challenges are different. And the challenges really are
13 not solvable, you know, state by state, or company by
14 company. It was not hard to get the right minds thinking
15 the same way. Steve Wright is very committed to work with
16 us to resolve the issues, and we look at the West. The
17 advantage of the West of course is it's not as looped as it
18 is in the East.

19 If you look at really the key transmission
20 providers who can make it happen in the West, it is
21 Bonneville, California ISOs, and probably Arizona and the
22 Southwest. So the issues on integration of renewables, the
23 issues of renewables that are built out of California for
24 the purpose of California, and it was renewables that are in
25 California for use out of California. You know, we're

1 working on the dynamic scheduling.

2 We had dynamic scheduling before, and now we are
3 expanding it significantly with joint studies among
4 ourselves and Bonneville and others, and getting the
5 stakeholders involved.

6 So I am proud of where we are at. We meet very
7 frequently at the principals level. The joint staff
8 actually report to us as a group, not company by company.
9 So the commitment is to the entire interconnection to work
10 right.

11 And largely also in California the level of
12 collaboration among the state agencies, and by ISO and all
13 the stakeholders, are just--for me, I would of never thought
14 it would be that strong. For your information, Mr. Chairman
15 and Commissioners, in California all the energy agency
16 principals and ISO meet probably once a month with the
17 senior staff.

18 We have a joint vision paper for the state that
19 we all share. We have a joint plan amongst all of us to
20 implement the vision, with accountability for each agency,
21 including the ISO, what they're supposed to do by when to
22 achieve what.

23 We have metrics for the California agencies
24 collectively. We have a website that is apart from all our
25 groups, our individual websites, that there's joint

1 ownership of that vision and the plan to implement it.

2 And that is what made that transmission plan
3 materialize. It is driven by a commitment of all of us
4 working with us. The ISO is an insider, not an outsider, in
5 the state, together with other agencies.

6 When we have issues, it is our issues, not an
7 individual issue. And also, decision making of state
8 commissions are much broader now. It is not just based on
9 documents and a record of one thing for one agency. But
10 also looking at what they are supposed to do for the state
11 as a whole.

12 So within the state, and out of state, there is a
13 significant window of opportunity that never existed in the
14 past. And with your support, even though I already
15 mentioned as you recognized, Mr. Chairman, I can't say
16 enough about it. And thank you. We gave you policy, you
17 know, for policy decisions, to change policies that have
18 been the case, and we thought it would take a very long
19 time. But you acted on it, courageously lots of times, and
20 it made a big difference.

21 So between the state and you and our commitment
22 and our collaboration with you, we were able to achieve
23 this. The challenges--just to kind of alert you--the
24 challenges remaining are even more significant, but we're on
25 the right track.

1 CHAIRMAN WELLINGHOFF: We can all work together.
2 And thank you for your vision and your work on it, Yakut, I
3 really appreciate it.

4 And Nick, not to ignore you, I want to tell you
5 how much I appreciate the work you are doing, and your
6 vision, and what you have done with respect to both
7 transmission planning and cost allocation in SFPP. And if
8 you wanted to elaborate on that, some of where you see your
9 region going and working with your neighboring regions as
10 well.

11 MR. BROWN: Well, again, the benefit of the
12 formation of our regional state committee continues to amaze
13 me. As has been said many times this morning, we are all in
14 this together--highly interconnected, highly interdependent.
15 And our ability to use that forum to bring the individual
16 retail commissioners together to understand that, more often
17 than not the constraints from a transmission perspective in
18 one state lie next door. And you can gold-plate the
19 transmission network in one state, and that will get you
20 right to the border and no further.

21 So we truly now are understanding that we need to
22 work together across those state borders. And I have,
23 again, just been truly amazed at the ownership that they
24 have taken to the specific things that were delegated to
25 them in our RTO compliance filing.

1 Cost allocation was specifically delegated to the
2 regional state committee. They took ownership of that.
3 They dealt with it first on the base plan funded upgrades.
4 Then, on the balance portfolio of upgrades. And then now on
5 the economic upgrades going forward. And we're finally
6 looking at our planning processes 20 years into the future.

7 You know, it's amazing to me how long these
8 assets have been around. The vast majority of generation in
9 our footprint is over 40 years of age. And yet, in our
10 planning processes on transmission, we've only looked at a
11 10-year valuation of that. So we're finally making great
12 strides in that.

13 A goal of mine, I talked about the quantitative
14 benefits and the qualitative benefits. I continue to remain
15 a little bit frustrated that we're leaving value on the
16 table. We are only looking at the value of transmission
17 from an adjusted production cost savings basis. And we all
18 know that transmission creates so much more value than just
19 that.

20 We need better tools to help us quantify those
21 values and get that into a regulatory proceeding so that
22 they are recognized every bit as much as the adjusted cost
23 savings.

24 CHAIRMAN WELLINGHOFF: Good. Well, as I say, Joe
25 Eto is going to present one of those tools in a moment here.

1 But I again want to thank you all. I've spent
2 enough time. I want to let my colleagues here--Phil?

3 COMMISSIONER MOELLER: Thank you, Mr. Chairman.
4 I know we are squeezed for time, so I will be quick.

5 To me this is a larger philosophical discussion
6 on the higher level of do you see the consumer benefits of
7 more market forces, or are you blind to them? I've seen
8 them throughout my career, raising cattle as a kid, salmon
9 in Alaska, telecom, and transportation policy, and what
10 we've seen in the electric industry over the last 15 to 20
11 years, and what you've demonstrated today, is an enormous
12 success story.

13 It's a difficult story to tell, but it's one that
14 we need to continue to tell because of the market forces
15 that really make this country great.

16 I want to commend all of you for the commitment
17 to transportation--or transmission planning, and what you've
18 done, but also urge that the urgency needs to continue
19 because of the difficulties ahead of us on that realm.

20 We are going to hear a presentation momentarily
21 related to the integration largely of renewable and variable
22 resources. And one of the conclusions that I draw out of
23 that is the need to perhaps better compensate frequency
24 response. And I know that you all are in various stages of
25 that. But if you can give brief observations about your

1 views going forward on that, that seems to be perhaps a
2 market-based solution that will help us with the challenges
3 that we are going to increasingly face with variable
4 integration.

5 MR. BOSTON: Phil, let me take a shot at that.

6 Clearly the EPRI study was enlightening to me,
7 when we think about PJM needs about 1,000 megawatts of load
8 frequency control capacity on the system. And so we are
9 working on every aspect that we have.

10 And in the appendix of the slides there we have
11 a 20 megawatt flywheel. We have 34 megawatts of stationary
12 batteries. As a matter of fact, we have a 1 megawatt
13 stationary battery just outside my window so I can watch it.
14 It responds in 50 milliseconds to when we send it a signal,
15 where we're talking very slow response if you've got a once-
16 through boiler or coal-fired unit trying to do load
17 frequency control.

18 Plug-in hybrid vehicles are going to change our
19 world considerably. They are a play where we can put the
20 wind at night and store energy. We can also do load
21 frequency control with those devices.

22 It is going to be slower than what we need. And
23 as a matter of fact, I have a picture of the D.C. Public
24 Service Commission in front of a Volt that I bought with my
25 own money. It has 16 kilowatt hours of storage. But we're

1 looking at can we do load frequency control in a large scale
2 with those? And the answer is, yes, perhaps even using
3 OnStar as a communication means to do it.

4 But my favorite is a little surprising. It's
5 water heaters. There is about 25 gigawatts of water heater
6 load connected to the electric system. It's more rural than
7 it is urban because of the gas competition for heating
8 water, but a water heater we have in our lobby is responding
9 to load frequency control signals. And it can store about
10 26 kilowatt hours--considerably more than that Volt that's
11 in the parking lot.

12 And we may need your help. DOE has some
13 efficiency standards that doesn't allow the larger tanks,
14 but if you're going to do storage in a big way, the French
15 heat 70 percent of their water at night because, with their
16 nuclear-based load they need a place to put the energy.
17 With our wind being more dominant at night, and with the
18 potential of offshore wind in addition to the terrestrial
19 wind, we need to look at storage, and we need to be able to
20 pay for performance.

21 And part of that is getting the cost of
22 regulation in line with the performance that you get out of
23 the regulators. And part of the metrics, we were first to
24 admit that Gordon had it right, that you have to pay for
25 performance, and we will be moving to the Commission with a

1 pay-for-performance regulation much like New England has
2 already done.

3 MR. WELIE: I would just like to add to that. I
4 think it depends on how you define "frequency response." I
5 mean, traditionally you've looked at it as the regulation
6 market, and I think it is much broader than that.

7 So I think the issue of ramping is a critical
8 issue. So if you look at markets where you have a
9 relatively steady state and you are sort of fine-tuning the
10 system, the regulation markets that we have I think do a
11 decent job.

12 When you have big transitions, because you're
13 over-generating, or you're dramatically under-generating,
14 and you've got to deal with that rapid transition, the
15 flexibility of your system and the performance of all the
16 resources on the system becomes critical. And we had some
17 events this past summer that really opened up our eyes to
18 some vulnerabilities that we have.

19 So I think it is ramping. I think the incentives
20 in the market to incent performance. I think the LMP
21 markets have done a great job of driving efficiency, but
22 what they've also done is they've created incentives for
23 resource owners to reduce flexibility to the system
24 operator. And so I think we need to look at that.

25 MR. MANSOUR: We have done extensive studies, as

1 you know. In our case, as you know, as I mentioned in my
2 remarks, if you look at the 33 percent target, RPS, that
3 amounts to about 28,000 megawatt of nameplate capacity on a
4 state that have currently about 50,000 megawatt in-state
5 generation and 50,000 megawatts, relying for 25 percent on
6 out-of-state generation.

7 So you can imagine what I have in the state to
8 work with is quite limited compared to the aggressive target
9 of the state.

10 To sum it up, my biggest concern is really to be
11 able to sustain the capability of the fleet that's in there
12 today, having them in there from, basically from even
13 maintaining the facilities but also creating a business
14 model and products priced right so they can still stay in
15 business.

16 The challenge based on the very detailed studies
17 we have done, even for the 20 percent, and then extending it
18 to the 33 percent, the ramping duty is almost in cases about
19 four times as it is today. Regulation is about the same.

20 The start/stop, you know, generation start/stop.
21 It will increase by about 35 percent, especially with the
22 addition of solar. Adding solar--we always talk about wind,
23 and when they blow and when they don't blow, and adding
24 solar in the bookends of a day, in the beginning and the end
25 of a day, makes things worse in terms of start and stop.

1 Solar is very fast, and it changes very fast.
2 And also coming in the morning, it doesn't come at the same
3 time when the wind is kind of decaying. So you kind of have
4 that start/stop generation on the generators. And of course
5 not every generator can take that. And when you have new
6 generators that can do that, you have to provide them, you
7 know, the right signal so they can invest and be there.

8 So that's one area. So we can solve that by, let
9 us say, investing in generators. But what we would like
10 also to see is, frankly, to a reasonable extent have the new
11 technology, or the new resources--wind, and solar, and
12 others--on some of those issues, and work on resolving them.

13 If everything is left to the grid, whether it's
14 from a voltage control, or what area, it's all on the grid,
15 we can do it, but it's not going to be the most efficient.
16 It is not going to be very cost effective, either. And I'm
17 not saying on it all, but take oversight of some of those
18 issues.

19 It also will have--again, when we talk about
20 behavior, the more they own it, the more innovation will
21 happen. If you leave it all to the grid to do it with
22 traditional, you know, just firing up more generation and it
23 doesn't even help with the CO2 very much, the more you own
24 the issues and deal with them, as to how to deal with them.

25 For example, storage. Where does the storage

1 belong? Well, it could be on its own. I don't know how
2 many banks will actually finance storage centers as a
3 business on its own. But if they manage between storage and
4 the renewables is done at the source, given that there are
5 standards that make certain requirements in knowing the
6 technology that exists, we're hoping that those kind of
7 requirements will encourage innovation at the source.

8 And when you do that, then we're going to get a
9 very efficient system that's different from the past. But
10 solving every nail with a a hammer, with the same hammer, we
11 can solve it, but the direction on reliability and cost is
12 not going to be necessarily the best solution to do so.

13 MR. WHITLEY: Let me just add, a bunch of our
14 system operators went over to Spain this year. They're a
15 very heavy wind operation. And we found that they're
16 carrying 100 percent reserve margin with gas plants to
17 handle all these problems we're talking about.

18 So, you know, that can get very expensive. So I
19 think this is a great subject, Commissioner Moeller, that we
20 are taking up. Another good news thing about our
21 collaboration together is that we have a very good, now, IRC
22 Council with committees. We have a markets committee. We
23 have an IT committee.

24 And the markets committee is taking this issue
25 up, looking at what have we all learned so far? What are

1 the best models? What else do we need? And we'll be
2 working together, and that will be one of the actions that
3 we will take out of it. So today that was a great question.

4 MR. BOSTON: One point that didn't get brought
5 up, and I thought it would, is pump storage. There's 24
6 gigawatts of that nationwide. It was built to enable our
7 nuclear fleet to run baseload, 5500 megawatts of that. And
8 through the FERC's licensing processes, those plants come
9 forward. You can increase the capacity output of those
10 plants by 10 to 15 percent by computer optimization of the
11 turbine.

12 No civil work, and no modifications, pin stocks,
13 et cetera, but by computer optimization of the turbine
14 generator transformer cycles. So there's some real
15 opportunity.

16 Unfortunately, new pump storage will take 7 to 10
17 years to get through the siting process, and the wind will
18 be here much faster than you can build those new pump
19 storage packages.

20 CHAIRMAN WELLINGHOFF: Thank you, Terry. Thank
21 you, Phil. Marc?

22 COMMISSIONER SPITZER: Thank you, Mr. Chairman.

23 I agree with the comments of my colleagues, and
24 perhaps to build on that, discussion has taken place. It
25 seems to me that the word of the day is "value." And in

1 terms of the presentations you've made, there's an
2 introspective aspect and an expositive aspect.

3 And then from a temporal view, there's the
4 retrospective, and I think what we're more interested in,
5 forward-looking analysis of the value that we have all
6 created. And it seems to me, whatever aspect of electricity
7 that we explore, the expositive, the explaining to
8 stakeholders, and particular customers, the value that we've
9 created, is critical, whether it's transmission, generation,
10 energy efficiency, demand response, plug-ins, Terry,
11 SmartGrid, the communication, the expositive of the value on
12 a going-forward basis is essential if we're going to get
13 success in all these areas--if we're going to get the steel
14 in the ground, the wires, the new technology deployed.

15 That is, this forward-looking aspect, is the
16 challenge.

17 And in going over my notes, I came up with three
18 principal points. And maybe I would pose a question
19 illustrative of the exposition and the forward-looking
20 aspect of the value chain in connection with these three
21 points, which is:

22 One, we have all talked about competitive markets
23 and how they enhance value.

24 And then the nuts and bolts demonstration of the
25 value and its various iterations.

1 And then finally, what is clear is, although
2 there is a lot in common, there is a respect both in our
3 level and in yours for regional diversity; that there's not
4 a one-size-fits-all ISO/RTO. Because we've got diversity in
5 geography, in fuel, in historical system, in the views of
6 the stakeholders, in the needs and concerns of state
7 regulators. So one-size-fits-all is not correct.

8 And we can take I guess further value from the
9 diversity. And instead of seeing it as a nuisance or an
10 irritation, we can see it as adding to the value
11 proposition.

12 So in light of that discussion, that we're
13 communicating value to our mutual ratepayers, on a forward-
14 looking basis, why don't you pick the next great thing in
15 the next five years that's the value proposition from your
16 particular perspective? Going forward, how would you then
17 communicate that to the customers? Terry? Or Steve?

18 MR. WHITLEY: Commissioner Spitzer, thank you
19 very much. I think in our case it is the seams' projects we
20 call Broader Regional Markets. There's just huge value to
21 consumers in the greater region, New York and all of its
22 neighbors.

23 And so that is clearly the target we're going
24 after, and that has been communicated with all of our
25 stakeholders, the commission, the legislators, and so forth

1 in our region. And that is on the plate going through the
2 pipeline right now.

3 The second thing that we see a lot of value in is
4 helping the aggregators, the demand response folks, add more
5 value to the market--you know, peak shaving, and things like
6 that--trying to get the benefits of real-time pricing
7 through the aggregators. And that is one of the initiatives
8 we're working on.

9 But the big dollars for us right now that we're
10 really focused on are the seams' projects, Broader Regional
11 Markets.

12 MR. MANSOUR: Knowing that it is difficult to
13 pick one, I am going to pick one that actually includes
14 many. You know, really when you just step back,
15 Commissioner, and you look at what we're in today, I can't
16 believe any other generation can be more fortunate than we
17 are, and actually any other commission in your position
18 could be more fortunate than you are. We are witnessing
19 history that is coming up--not history back--that is more
20 exciting, challenging, full of opportunity, arguably, since
21 the Edison era.

22 Never in time were we facing all those change in
23 a huge way, whether it's the technology on the resources
24 side; demand participation; SmartGrid; and I can go through
25 all the list we went through, all at the same time in a

1 massive way like we are facing today.

2 And a challenge? That is it.

3 Now if you look at how to make it happen, you can
4 unbundle that down and it's almost every policy you had
5 before you need to have another look at it today. And of
6 course we're all guilty by giving you a lot of policy making
7 all at the same time, but it's all coming from that point of
8 view of being able to integrate and rely on 33 percent of
9 the supply from new resources, with new technology, in a new
10 operating way, in a new planning, and a new--letting the
11 customer participate end-to-end. When we're talking about
12 value, we're talking about the time now is to create value
13 in the entire value chain end to end where, whatever the
14 customer does it impacts everything back all the way up to
15 the ISO and the RTO.

16 Those are the kinds of things that we are very
17 fortunate to actually be able to do this. And five years
18 from now, you look at what we've done in the last five
19 years, which is from now on, that is the time where it is
20 very important and very crucial, actually, that we set the
21 fundamentals right and the foundation right.

22 Because whatever we do in the next five years as
23 foundation for that picture I've just given you is what is
24 going to matter for decades to come. And that's how
25 fortunate we are.

1 MR. WELIE: I can't resist. I'm going to have to
2 build on that. So I think there are two foundational
3 elements looking forward that drive huge value:
4 transmission, and we don't need to spend a lot of time
5 talking about that, and I think from the New England point
6 of view we just need to finish that.

7 The other part really is completing the
8 integration of DR into the dispatch. It's to me a
9 foundational of the SmartGrid. If we don't get this right,
10 you'll never make SmartGrid work.

11 DR at the moment is not being dispatched on an
12 economic basis. It's an on/off decision by the operators
13 under certain market rules. And that's not the way to do
14 SmartGrid in the long run.

15 So if we want SmartGrid to work, we have to solve
16 this problem. So there's lots of work to be done there.

17 MR. MANSOUR: At the retail level.

18 MR. BEAR: I would say it's transmission planning
19 and getting the transmission built. You know, it would be
20 enough if we had a static system because of the congestion
21 that's on our system and the ability to reduce the amount of
22 generation resources we need just by building out that
23 infrastructure. But when you look at the change that is
24 happening in our portfolio that's been referred to by
25 others, and we largely, like Terry, have an aging fleet, 45

1 years old--85 percent of our energy comes from coal--a lot
2 of those plants are going to be under a lot of pressure for
3 retirement.

4 And when you look at the incentives that need to
5 be there to make sure that we can then integrate the new
6 resources into our system, renewables--we're at about 9,000
7 megawatts now, moving to 25--we've got to provide the right
8 incentives.

9 And I agree with Terry. Gordon's got it right.
10 You have to pay for performance. So as we look at ramping
11 products and the different incentives for frequency response
12 and other things, we've got to think larger. It can be for
13 demand response, too, not just to existing resources.

14 And also for wind. Wind can ramp down very
15 efficiently and very well, if given the right incentives.
16 And then the existing portfolio can also do that, if we
17 provide the right incentives so that they can make the right
18 investment to get the flexibility they need.

19 So I would say it's transmission.

20 MR. BROWN: I agree. Transmission.
21 Transmission. Transmission. And for a little bit different
22 reason, but I certainly agree with everything others have
23 stated.

24 At the end of the day we can plan it, great. We
25 can determine how to allocate the costs in a wonderful

1 fashion and get everybody on board with that. But then we
2 have to site it. And if we get hung up in the siting
3 process year after year after year, the issues that were
4 raised by John and others of how are we going to deal with a
5 retiring coal fleet and the integration of renewable
6 resources? And to create options for end-use customers?

7 The end-use customer, I'm ashamed to say, doesn't
8 fully appreciate how highly interconnected and highly
9 interdependent the transmission network in this Nation is.
10 And when we get into the siting issues, if we don't do a
11 better job of communicating the value of that transportation
12 network for the Nation's needs, then we are going to get
13 hung up.

14 So we must do a better job of communicating that
15 message.

16 MR. BOSTON: I'm going to take you to the same
17 point but with a different perspective, I guess. I fear a
18 little bit that we want to get in the IRP business instead
19 of the market-making selections. And I remember when
20 nuclear was going to be too cheap to meter. I remember when
21 we had a Fuel Use Act that said you couldn't use natural gas
22 for baseload generation. I remember when we were building
23 LNG terminals offshore, absolutely sure that we were running
24 out of fuel.

25 We haven't been really good at forecasting fuel

1 prices and what's happening across the Nation. I actually
2 did a coal-to-gas and oil backout study when the oil embargo
3 occurred. We had 20 percent of the fleet that was coal--was
4 oil, now less than 1 percent of the fleet.

5 We will see changes in the fleet, but the weather
6 diversity, the fuel diversity we have, the larger regions
7 that you are able to optimize that over with the seams
8 agreements and with our transmission planning, if you look
9 worldwide, 20 percent of the transmission is AC/DC, with
10 controllability.

11 If you look at what's being built in Asia and
12 Europe, there's a lot of AC/DC being built. Being able to
13 take advantage of the diversity of fuel, the diversity of
14 weather, and getting a strong, robust transmission system,
15 and our operators can only play with the cards that our
16 planners have dealt them. So getting the transmission
17 system robust will lower costs more than anything else that
18 we can do. And it will allow the market to make the right
19 fuel choices.

20 It will allow demand side and supply side to
21 compete in a fair way, regardless of where they're located
22 within a region.

23 CHAIRMAN WELLINGHOFF: Marc, anything else?

24 COMMISSIONER SPITZER: No.

25 CHAIRMAN WELLINGHOFF: Thank you, Marc. John?

1 COMMISSIONER NORRIS: Thank you, Mr. Chairman.

2 Let me say, I echo what you've heard from
3 everyone else in terms of the thanks for what you do. I
4 doubt too many people in California this morning woke up and
5 either went for the phone or logged on their e-mail, or
6 stopped at the Hallmark Store on the way to the office to
7 pick up a thank-you note to thank you for keeping the system
8 going, and keeping costs less than what they would have been
9 had you not been there.

10 (A inaudible comment is made off-microphone.)

11 COMMISSIONER NORRIS: Oh, okay. Good.

12 (Laughter.)

13 COMMISSIONER NORRIS: Good, good. So I'm glad we
14 can all give you all a pat on the back this morning.
15 Because I know you all take plenty of arrows on a daily
16 basis, and what you do is--the fact that the GAO asked for
17 some verification of your value, I mean that's an arrow in
18 itself. And then when you take calls from state
19 commissioners, and consumer advocates, and industrial-owned
20 utilities, and public-owned utilities every day challenging
21 what you do--so I'm glad that we had this opportunity today
22 to highlight the value you bring to the table.

23 I would just say on that vein, because you know
24 this is probably going to continue, it's the nature of your
25 business, that one of the most important things you do, as I

1 look at these reports and look at your operations, is the
2 culture you've established of transparency. That is going
3 to be important to continue going forward.

4 I think it empowers people to participate in your
5 process, to capitalize on the value you add, and hopefully
6 work with you and enhance that value. So I just encourage
7 you to keep that culture of transparency going.

8 Thanks.

9 CHAIRMAN WELLINGHOFF: Thank you, John. Cheryl.

10 COMMISSIONER LaFLEUR: Well thank you all.

11 As every has said, it's just enormously valuable
12 to have all of you here. I have enjoyed getting to know
13 those of you I didn't know already, and learning more about
14 the accomplishments of your teams and your boards and your
15 organizations, and your stakeholders.

16 I think both your comments this morning and the
17 report itself really highlighted the ways in which all of
18 your organizations are creating value for customers across
19 all the dimensions we measure: reliability, cost, and the
20 environmental profile. And all of them have been touched
21 on, and I agree with everything that has been said about
22 communicating and building on those.

23 I just have one question. I want to turn the
24 lens a little bit back to FERC for a minute. Several of you
25 have been generous in your thanks for us just doing our job

1 in dealing with things that you file with us. But as you
2 look at all the challenges and opportunities that you have,
3 are there issues we should have on our radar screen that we
4 maybe are not thinking about enough? Or things that you
5 could use more help on? Even if they're long-run
6 opportunities or technologies, are there things that, while
7 you're here?

8 MR. WELIE: I think--and Terry mentioned this,
9 and I'm a little concerned about this, and we are
10 approaching this conversation with our stakeholders--there's
11 a great temptation to slide back into integrated resource
12 planning as we try and tackle some of the problems that are
13 going to be big challenges.

14 I mentioned this probable retirement of a large
15 chunk of our generation fleet. Ironically, the success
16 we've had with regard to building transmission in New
17 England has sort of started a conversation around: Well,
18 should we not be making custom service investments in
19 nontransmission alternatives?

20 As Terry sees some of the older oil--coal fleet
21 retire, I think you're going to get into the same
22 discussions. And I think it's a real philosophical
23 question. We started this journey more than a decade ago
24 saying that transmission is a regulated monopoly. We don't
25 want to have two transmission systems, so we will have that

1 be a regulated monopoly and give it cost-of-service
2 treatment. And we also said we think that establishing
3 wholesale markets are going to be the mechanism by which we
4 get the most efficient outcomes.

5 The more we sort of put our finger on the scale
6 in terms of selecting certain resource pipes in the
7 wholesale market, the more we sort of contract for these
8 resources on the side, the harder we make it to be able to
9 make the wholesale market work.

10 And so that is one of the big challenges I see
11 going forward. And I feel the pressure in New England. I
12 see the pressure on you as the FERC. I think it is going to
13 be one of the big challenges over the next decade, figuring
14 out how we get through all of this to keep the system in
15 balance.

16 MR. MANSOUR: I'll just say, again, on the items
17 or the areas that we are measuring, I'll just add a note on
18 those.

19 First of all, back to what I said on reliability.
20 The system is not the same. The technology is not the same.
21 There's a lot of variable components. What has been
22 straightforward is not going to be as straightforward. And
23 whether that means different reliability standards for the
24 newcomers from the beginning, so for the longer run now, I
25 think Joe and Jim were with me in Spain when Spain went on

1 the track of accommodating a lot of new facilities. And it
2 was kind of just a calm, and then at some point in time they
3 found that the system cannot take it any more and they had
4 to go back and actually put even requirements on the
5 existing plants, and the future ones, to make the system
6 work.

7 I think there is enough to learn from around the
8 world, whether from our studies or from the examples in
9 there, to set the foundation for a reliable system
10 correctly. That's again, I know that all the reliability
11 standards, and how we measure reliability, and what is
12 important to look at as far as what the Commission is
13 looking at and your capable staff is looking at, but that is
14 a very important one: What has been straightforward is not
15 going to be anywhere near as straightforward. Whether it's
16 new standards, or even the standards that has been working
17 under the old regime, won't work now. Many of them we know
18 that they wouldn't, but others do need to think of. That's
19 on the reliability side.

20 On the market side, again I want to emphasize the
21 role of the traditional facilities and making sure that
22 market products and pricing is fair and attractive in a
23 reasonable way that we can still kind of get the investments
24 made, so we can support a reliable operation.

25 Again, part of the reliability standard is the

1 details of the interconnection of that new technology to the
2 grid. That is again a very important area that we need to
3 look at.

4 MR. WHITLEY: Commissioner LaFleur, I just wanted
5 to comment on one aspect of what FERC is already working on
6 and just talk about how important it is. And that's the
7 transmission planning area that you're working on.

8 I would sort of tie it back into a comment Nick
9 made about going to get siting. I've had the opportunity to
10 be involved in a lot of siting hearings in New England for
11 new transmission projects, and they were all reliability
12 based. And you could go in front of the Siting Council, and
13 you could say we've run these studies. These studies show
14 we can't meet NERC criteria, MPCC criteria, with the
15 existing system. We have to do something or the lights will
16 go out.

17 That worked. You can get through siting if you
18 have a compelling case like that. It's going to be tougher,
19 much, so much tougher now that we're talking about
20 economics, and policy projects, when you go in front of that
21 Siting Council and they say: well, why do you need this?
22 And you say: Well, I've looked at lots of different
23 alternatives and this one looks like it would reduce our
24 production costs.

25 But then the opposition is always going to have

1 five more economists pointing out all these other
2 alternatives. You know, you should of put in more
3 efficiency, and all these other things. So it's just going
4 to be worldly more complex and difficult in siting,
5 especially that we don't have a national policy on these
6 environmental--on carbon, for example.

7 So the work you are doing on this is really,
8 really important, if we are going to move forward on getting
9 these facilities built, infrastructure built for renewables
10 and those kind of public policy areas.

11 MR. BOSTON: I might add just a little bit on
12 transmission. If you look at the plan, we've got a lot of
13 transmission planned, enough to keep linemen and vo tech
14 schools working very hard to provide us the workforce that
15 we need to build that transmission.

16 At the end of the day, we forget about the
17 importance of the robustness of the transmission system.
18 Yakut and I were on the August 14th, 2003, Blackout
19 Investigation, and clearly the blackout tore across a weak
20 seam in the system. So having that robust transmission
21 system is very important.

22 Cost allocation and siting are the two biggest
23 issues in my mind. Cost allocation for transmission is 7
24 percent of the cost of electricity in our wholesale market
25 last year where the fuel price was the lowest on record. So

1 we spend 70 percent of our time dealing with something that
2 cost 7 percent of the cost of electricity.

3 We need consistent rulemaking that we can apply
4 nationwide on cost allocation. And we need to get consensus
5 with our 56 public service commissioners in my case on how
6 to work through the siting process on the state siting of
7 transmission.

8 Those two things would make our life so much
9 better.

10 MR. BROWN: Ditto.

11 (Laughter.)

12 COMMISSIONER NORRIS: The Chairman said he's
13 going to take care of that, too.

14 (Laughter.)

15 MR. BOSTON: They're not easy. I've worked on
16 them for a long time.

17 MR. BEAR: I would say the things that they're
18 talking about, but it's also managing the balance. We've
19 got a pretty big portfolio transition coming up,
20 particularly in the Midwest. I know Terry has it as well,
21 and it sounds like Gordon might, also.

22 So while we get the transmission system built
23 out, which is going to take time, and we have this
24 uncertainty around carbon legislation and what it means to
25 those older facilities, we've got to manage that transition

1 in a reliable way. And balancing all of those things
2 together is going to be really difficult.

3 So how we look at the reliability standards, how
4 we look at the, whether it's TPA standards or the impact on
5 that older fleet, and how we build out the transmission, and
6 managing that altogether is going to be really tricky and
7 it's going to take a lot of thoughtfulness to manage that
8 the right way.

9 COMMISSIONER LaFLEUR: Thank you.

10 CHAIRMAN WELLINGHOFF: Thank you very much,
11 Cheryl. Great question. Great discussion.

12 Gentlemen, again I want to thank you all for
13 coming in and for taking this time. It really was very much
14 appreciated and very valuable. Thank you.

15 If we could go to our next presenter?

16 SECRETARY BOSE: That will be our last
17 presentation this morning. That is on Item A-3 concerning
18 the frequency response metrics to assess requirements for
19 reliable integration of variable renewable generation. And
20 that presenter is Joseph Eto. He is a staff scientist at
21 the Lawrence Berkeley National Laboratory in Berkeley,
22 California.

23 CHAIRMAN WELLINGHOFF: Welcome, Joe. A man with
24 his own name tent. I like that.

25 (Laughter.)

1 CHAIRMAN WELLINGHOFF: Please go ahead.

2 MR. ETO: Good morning, Mr. Chairman, and
3 Commissioners:

4 My name is Joseph H. Eto. I am a staff scientist
5 at the Lawrence Berkeley National Laboratory. Thank you for
6 inviting me here this morning to share the findings and
7 recommendations from my research project.

8 This study is the first to identify frequency
9 response limitations and verify that frequency response
10 metrics are useful for planning and operating the Bulk-Power
11 System reliably in the context of integration of new
12 resources.

13 The approach builds on existing industry
14 practices for controlling frequency after the unexpected
15 loss of a large amount of generation. The study introduces
16 a set of metrics and tools for measuring the adequacy of
17 frequency response within an interconnection.

18 Primary frequency response is the main metric
19 used in this study to assess the adequacy of primary
20 frequency control reserves, which are the form of operating
21 reserves needed to ensure the reliable operation of a power
22 system.

23 The primary frequency response metric measures
24 what is needed to arrest frequency decline--that is, to form
25 a frequency nadir--at a frequency higher than the highest

1 set point for under-frequency load shedding within an
2 interconnection.

3 The frequency response metrics introduced here
4 can be used to maintain the reliable operation of an
5 interconnection under changing circumstances, and to guide
6 and gauge the extent and success of the reliable integration
7 of any new resource into an interconnection. The metrics
8 can also be used to plan a path forward when existing
9 resource mixes undergo major changes, such as when
10 conventional power plants are retired or de-rated, or when
11 new forms of generation are added, such as variable
12 renewable generation.

13 The study tested and validated the frequency
14 response metrics through simulation studies of the
15 generation and transmission infrastructures that power
16 system operators expect to have in place in the year 2012.

17 Wind is expected to be a major new source of
18 renewable generation for each of the U.S. interconnections
19 in the near term. Wind generation creates challenges for
20 the reliable operation of the power system in part because
21 the electricity generated from wind is more variable than
22 the electricity generated from conventional sources.

23 The purpose of this study was to determine and
24 validate metrics that can be used to assess and plan for the
25 reliable integration of any amount of variable renewable

1 resources.

2 The research team validated the metrics by
3 applying them to simulation studies of the U.S.
4 interconnections. The approach showed that the wind
5 generation capacity projected for 2012 in the Western and
6 the Texas interconnections can be reliably integrated.

7 Using a slightly modified approach, it was also
8 determined that the wind capacity projected for 2012 in the
9 Eastern interconnection can be reliably integrated.

10 In general, as resources are added to or removed
11 from the grid, the approach can be used to determine the
12 changes in primary and secondary frequency controls that are
13 required, which would be in addition to the transmission
14 that is required, and which would be identified through
15 other studies.

16 Based on our analysis, we make the following
17 recommendations:

18 One, efforts should be accelerated now to better
19 understand interconnection- and balancing authority-specific
20 requirements for frequency control, especially in the
21 Eastern interconnection, considering, among other things,
22 the frequency response metrics validated in this study.

23 Two, interconnections must schedule adequate
24 primary and secondary frequency control reserves both to
25 manage the variations caused by increased levels of wind

1 generation, and to withstand the sudden loss of generation
2 which can occur at any time.

3 Three, the frequency control capabilities of the
4 interconnection should be expanded as follows:

5 (a) By expanding the use of the existing fleet of
6 generation such as improved generator governor performance,
7 increased operating flexibility of baseload units, and
8 faster start-up of other units.

9 (b) By expanding the use of demand response that
10 is technically capable of providing frequency control--
11 potentially including SmartGrid applications--starting with
12 broader industry appreciation of the role of demand response
13 in augmenting primary and secondary frequency control
14 reserves.

15 (c) By expanding the use of the frequency
16 control capabilities that can be provided by variable
17 renewable generation technologies--such as primary frequency
18 control.

19 And finally, (d) By expanding the use of
20 advanced technologies such as energy storage and electric
21 vehicles.

22 Four, comprehensive planning and enhanced
23 operating procedures, including training, operating tools,
24 and monitoring systems, should be developed that explicitly
25 consider the interactions between primary and secondary

1 frequency control reserves, and address the new source of
2 variability that is introduced by wind generation.

3 And finally, five, requirements for adequate
4 frequency control should be evaluated in assessments of the
5 operating requirements of the U.S. electric power system
6 when considering new potential sources of generation and the
7 retirement of existing generation.

8 This concludes my summary of the study. Let me
9 end this presentation by expressing my gratitude to the
10 Commission for sponsoring this work.

11 CHAIRMAN WELLINGHOFF: Joe, I want to thank you
12 very much, and LBNL, and the entire research team that I
13 know included people outside of LBNL, for a fine job in this
14 report. I think you did a wonderful job.

15 I would also like to thank the FERC staff that
16 initiated and managed this project. As we are all very
17 aware, every day the electricity system manages myriad
18 demands and challenges, including, as Joe explained,
19 maintaining adequate levels of frequency response so that
20 service to consumers is not interrupted.

21 This study is valuable in that it validates for
22 the industry a tool to help determine how to manage
23 operation and expansion of the grid, regardless of which
24 resources the electric industry uses to generate power.

25 Later today, the Secretary's office will issue a

1 notice inviting comments on this study, and I look forward
2 to reviewing those comments.

3 Colleagues, comments? Question? Phil?

4 COMMISSIONER MOELLER: Thank you, Mr. Chairman.
5 I want to point out a couple of things.

6 Thank you, Mr. Eto. The first is that the
7 distinctions you draw between the three interconnections I
8 think are useful for people to focus on. But also, footnote
9 2 points out that this study expanded midway. And I think
10 that is important to point out, too, because a lot of us
11 have been waiting for this for a long time. We thought it
12 might be six months, and then the work we gave you broadened
13 quite a bit. And that is an important consideration in
14 terms of what you came up with. Because there were concerns
15 that, you know, the news out of the study was being shelved,
16 but it was really more a fact that you had to do a lot more
17 than we initially told you to do.

18 So with that, Mr. Chairman, thank you.

19 CHAIRMAN WELLINGHOFF: Thank you very much, Phil.
20 Marc?

21 COMMISSIONER SPITZER: Thank you, Mr. Chairman.

22 I am going to post a more fulsome discussion, but
23 I wanted to thank you and your team for this engineering
24 study. It is important to differentiate what the study does
25 state, and some issues that it does not address.

1 It should not be read to make any findings or
2 conclusions as to costs, rates, economic choices, or
3 resource choices. It does not provide a basis for changing
4 our rules or policies for certain kinds of resources, or to
5 incent energy resources, or to create preferences.

6 As we have stated before, the Commission doesn't
7 pick winners and losers in generation. And the goal of our
8 activities is always the standard obligation to ensure
9 reliable service and ensure that rates are just and
10 reasonable and not unduly discriminatory.

11 But the metrics presented addressing frequency
12 response under the conditions certainly will play a role
13 going forward in ensuring the reliable operation of the
14 grid. So it is important to fully appreciate the temporal
15 discussion through '012 of what you've accomplished, but
16 also preserve the rights of the parties and in future cases.
17 And I appreciate the Chairman's admonition that there are
18 going to be comments taken on the study going forward, and
19 it is very important in terms of reliable resource
20 integration for all the stakeholders to express their views
21 and I look forward to that discussion.

22 Thank you, Mr. Chairman.

23 CHAIRMAN WELLINGHOFF: Thank you, Marc. I
24 appreciate it. John?

25 COMMISSIONER NORRIS: Thank you, Mr. Chairman.

1 Thank you, Mr. Eto, for your report. I often say
2 that we have to deal with economics, and environmental
3 policy, and a number of issues we have to deal with, but the
4 physics is always the one that doesn't move much. And we've
5 got to take that into account.

6 And so you have helped us take that into account
7 with this study. We now--as Francis Bacon said, "Knowledge
8 is power." And if we want to move forward on all the energy
9 goals that we talk about as a Commission and as a Nation,
10 this is the type of information we need to do it right. And
11 those panelists who sat here right before you can run what
12 they run better because of information like this.

13 So I am pleased that we had this done. It
14 enables us to move forward in a direction that makes sense.
15 So I appreciate your work, and I appreciate your leadership,
16 Jim, on getting this study done and helping us chart a
17 course forward that makes sense.

18 CHAIRMAN WELLINGHOFF: Thank you, John, I
19 appreciate it. Cheryl?

20 COMMISSIONER LaFLEUR: Well thank you.

21 Thank you, Joe, and our own Joe, for getting this
22 study out. Even if the study wasn't originally planned I
23 guess to come out today, I think it is a perfect
24 counterpoint, or counterpart to our first conversation.
25 Because by its nature frequency response is a collective

1 quantity, and no one electric company can measure frequency
2 response. It's something you have to do really over the
3 whole interconnection.

4 And so this is really a role where federal
5 research can help do something that nobody can do by
6 themselves. And I hope the report will be widely read and
7 commented on, and really be a tool for the planning in the
8 interconnection to NERC and others as we move forward.

9 It's interesting that, although the growth in
10 wind generation really was the spur to start the report, the
11 characteristics of frequency response--and the report found
12 that we have adequate frequency response for our short term
13 needs--but the problem goes well beyond variable generation.

14 You could just as easily use the metric to
15 measure the impact of a lot more inflexible baseload
16 generation. So I think the report really confirms something
17 I believe in, which is the importance of diversity of
18 resources, supply and demand side resources, of different
19 kinds. And that is a contribution, also.

20 So thank you, very much.

21 CHAIRMAN WELLINGHOFF: Thank you, Cheryl.

22 And again I want to thank you, Joe, for this, and
23 Joe as well, and all your staffs and all that you've done in
24 this report.

25 If there is nothing further to come before the

1 Commission, we are adjourned. Thank you.

2 (Whereupon, at 11:17 a.m., Thursday, January 20,
3 2010, the 966th meeting of the Federal Energy Regulatory
4 Commission was adjourned.)

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