BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of

National Grid PLC and KeySpan Corporation - Proposed Merger

Case 06-M-0878

The Brooklyn Union Gas Company d/b/a KeySpan Energy Delivery New York - Gas Rates

Case 06-G-1185

KeySpan Gas East Corporation d/b/a KeySpan Energy Delivery Long Island - Gas Rates

Case 06-G-1186

January 2007

Prepared Testimony of:

CONSTRAINTS PANEL

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Q. Please state your full name and business address.

A. My name is Thomas S. Paynter. My business address is Three Empire State Plaza, Albany, New York 12223-1350.

Q. By whom are you employed and in what capacity?

A. I am employed by the New York State Department of Public Service as Supervisor of Regulatory Economics in the Office of Regulatory Economics.

Q. Please describe your educational background.

A. I received a Ph.D. in Economics from the University of California at Berkeley (1985), with fields in econometrics and labor economics. I have a B.A. in Physical Science and a B.A. in Economics, also from the University of California at Berkeley (1975). I am a member of the American Economic Association.

Q. Please describe your professional experience.

A. From 1983 to 1986, I was an Assistant Professor of Economics at Northern Illinois University, where I taught graduate and undergraduate courses in economic theory. From 1986 to 1990,

I was employed by the Illinois Commerce Commission as a Senior Economic Analyst in the Policy Analysis and Research Division; I was also a member of the Electricity Subcommittee of the National Association of Regulatory Utility Commissioners, and authored an article concerning coordination and efficient pricing for independent power producers, "Coordinating the Competitors," published by The Electricity Journal in November 1990. I joined the New York Department of Public Service in November of 1990.

Q. Have you testified previously before the New York Public Service Commission?

A. Yes, I have testified in numerous rate cases and other proceedings before the Commission. I have also testified before the Federal Energy Regulatory Commission (FERC) and the New York State Board on Electricity Generation Siting and the Environment.

Q. What are your current responsibilities?

A. My current responsibilities include analyzing competitive issues, efficient pricing, marginal costs, and regulatory policies. I have been a member of a staff team responsible for analyzing and commenting upon the system planning and pricing rules of the New York Independent System Operator (NYISO), since its inception. I have participated in numerous all-parties meetings related to the implementation of the NYISO tariff, including market power mitigation. I am a regular participant at the NYISO's Scheduling and Pricing, Market Structures, Installed Capacity, and Electric System Planning Working Groups; these all-party working groups develop proposals for NYISO rules and procedures, which are then subject to votes by market participants at the Business Issues, Operating, and Management Committees, before being acted upon by the NYISO Board.

Q. Please state your full name and business address.

A. My name is Edward C. Schrom, Jr. and my business address is Three Empire State Plaza, Albany, New York.

Q. By whom are you employed and in what capacity?

A. I am employed by the New York State Department of Public Service as Power System Operations Specialist in the Bulk Transmission Systems Section, Office of Electricity and Environment.

Q. Please summarize your educational background and professional experience.

A. I graduated from Rochester Institute of Technology with a Bachelor of Science in Electrical Engineering Degree in June 1974. I have taken graduate courses in Electric Power Engineering at Rensselaer Polytechnic Institute and have attended several seminars given by general Electric's Electric Utility System Engineering Design Group and its Power System Management Department. In 1977, I began working for the Department of Public Service as a Power Transmission Planner in the Power Division, System Planning Section. In late 1980, I was

appointed to the position of Senior System Planner. In the fall of 1990, I was appointed to the position as a Power Generation Planner and in August of 1998, I was appointed to the position of Power System Operations Specialist. I have testified previously in Article VII transmission siting cases, Article VIII and Article X power plant siting cases, the State Energy Master Plan (SEMP) III proceeding, in numerous rate cases, and on the qualifying status of an IPP plant before FERC.

Q. Do you belong to any professional associations?

A. Yes, I am a member of the Institute of Electrical and Electronics Engineers (IEEE) and the IEEE Power Engineering Society.

Q. Are you a licensed professional engineer?

A. Yes, I am registered as a professional engineer in the State of New York.

Q. What is the purpose of the Panel's testimony?

A. The Panel's testimony supplements that of the Merger Panel, which, among other things addresses the potential for the merger to

violate the Commission's policy on vertical market power, as provided by its Vertical Market Power Policy Statement (CASE 96-E-0090, et al., Statement of Policy Regarding Vertical Market Power, July 17, 1998). (VMP Statement) Our testimony responds to the claims by National Grid witnesses Schiavone and Saidi that the merged company would have no ability to increase downstate prices by increasing transmission constraints and that, even if it had such ability, any attempt to exercise it would be mitigated by the rules and procedures of the NYISO. For example, we analyze National Grid's ability to schedule or extend outages in order to increase downstate prices and thus benefit the merged company's downstate generation.

Q. Can you briefly summarize your conclusions?

A. First, the merged company would have the ability to increase downstate prices by increasing transmission constraints. Second, the rules and procedures of the NYISO do not in fact mitigate such market power. Finally, the merger would

compromise the governance of the NYISO and make it difficult to strengthen the NYISO rules and procedures to mitigate such market power.

Overview of Vertical Market Power Concerns

Q. Please briefly describe KeySpan's generation assets.

A. KeySpan Ravenswood owns about 2,400 Megawatts (MW) of generating capacity in New York City (NYC), which generated almost 6.4 million Megawatt-hours (MWh) of energy in 2005. (NYISO: 2006 Load and Capacity Report, Table III-2) This indicates an average capacity factor of about 30% in 2005, i.e. Ravenswood capacity generated on average about 30% of the its maximum output (6.4 million MWh divided by 2,400 MW divided by 8760 hours per year). KeySpan Ravenswood sells capacity and energy at market prices in New York City. KeySpan also owns about 4,200 MW of generating capacity on Long Island (LI), which generated almost 11.4 million (MWh) in 2005 (NYISO: 2006 Load and Capacity

Report, Table III-2). The LI capacity and energy is sold under long-term contract to the Long Island Power Authority.

Q. Please briefly describe National Grid's New York transmission assets.

A. According to National Grid's witness Schiavone, "National Grid owns approximately 5,700 miles of transmission in upstate New York rated at 115kV and higher, including interconnections with adjacent control areas." (Schiavone testimony, p. 5) Mr. Schiavone notes that these assets include interconnections to New England, Ontario, and Pennsylvania, as well as part of the Moses South interface (which carries power from Quebec). Within New York, National Grid lines form part of the Central East and Total East interfaces (between western New York and the Hudson Valley). National Grid also owns and operates the Leeds-Pleasant Valley and Athens Pleasant Valley lines, which carry power down the Hudson Valley. (Schiavone testimony pp. 5-7) The Leeds- and Athens-Pleasant Valley lines are

part of the UPNY-SENY (Upstate New York - Southeast New York) interface. (Schiavone Exh___(MLS-1))

Q. Can you briefly describe the impact of National Grid's lines on KeySpan's generation?

A. National Grid's lines are a critical part of New York's bulk transmission system, which allows upstate generators and imports to compete with downstate generators, including KeySpan's. Low-cost imports from upstate and out-of-state competitors tend to displace sales by KeySpan's generators, as well as reducing the prices received by KeySpan's Ravenswood generators.

Q. Why do downstate generators tend to lose sales to upstate and out-of-state competitors?

A. Most of the downstate generators are gas-fired or oil-fired and thus have relatively high fuel costs. In addition, many of the downstate generators are relatively old and inefficient. Because of the generally high operating cost of downstate generation, there is almost always some lower-cost generation available from

imports or upstate generators, which tend to displace generation from the more expensive downstate plants. This results in typical power flows of thousands of megawatts from western New York to eastern New York and down the Hudson Valley to displace a portion of the generation in New York City and Long Island. Exh.___ (CONSTRAINTS-1, Excerpt from NYISO: Comprehensive Reliability Planning Process Supporting Document and Appendices for the Draft Reliability Needs Assessment, Dec. 21, 2005, pp. 14-17.)

Q. Please briefly describe the vertical market power concerns raised by the proposed merger.

A. As discussed more fully by the Merger Panel, for almost half the time, KeySpan's NYC generators are in the same market as upstate New York, including National Grid's transmission service territory. The merged company would have a statewide disincentive to build or upgrade transmission facilities or facilitate the entry of competing generators, in order to restrict

imports and competition and thereby increase prices and revenues for its generators. Moreover, even when NYC is in a separate market, constraints on National Grid's system can limit transfers to downstate New York, which can increase the market prices and revenues received by KeySpan's generators. Thus the merged company would have a disincentive to invest in transmission facilities that would increase transfers to downstate New York; and the merged company would also have a perverse incentive to take or extend outages on the bulk transmission system, whenever such outages would limit transfers to downstate New York. Moreover, the merged company would have a perverse incentive to reduce maintenance and thereby incur more frequent unplanned (forced) outages, because the outages could reduced transfers to downstate New York.

Q. Can you give any indication as to the magnitude of the perverse incentive?

A. It is difficult to forecast transmission constraints and their price impacts, because they vary with load growth, fuel prices, the location of new generation and transmission, and other factors. The recent addition of 1,000 MW of generating capacity in NYC, and the pending addition of 660 MW of transmission capacity onto LI, may reduce downstate price impacts in the near term. However, load growth and pending generator retirements downstate and in the lower Hudson Valley could increase price impacts in the future. To provide an order of magnitude, we can consider the impact of a $1/MWh increase in NYC prices on Ravenswood's net revenues. In 2005, the Ravenswood units generated about 6.4 million MWh; thus a $1/MWh increase in the average NYC price, all else equal, could have increased Ravenswood's net revenues by over $6 million.

Q. How large would a reduction in transfers to NYC have to be to increase NYC prices by $1/MWh?

A. A reduction in transfers to NYC has the effect of increasing the amount of NYC load that must be served by higher-cost NYC generation. The relationship between NYC generation and price is given by the NYC Supply Curve. An estimate of the NYC Supply Curve for June 17, 2004 was developed by the NYISO for purposes of benchmarking new software. (NYISO: Market Trials VI: DAM Benchmarking, presented at Market Structures Working group, October 4, 2004) The NYC forecast loads that day ranged from 5,788 MW to 9,338 MW, well below NYC maximum peak loads of over 11,000 MW. The supply curve indicates that as load increased, NYC generation levels increased from about 2,000 MW to about 5,400 MW, and NYC prices increased from about $60/MWh to about $120/MWh. This indicates an average price impact of about $1.76/MWh per 100 MW increase in NYC generation. This implies that a 100 MW reduction in transfers would increase NYC prices by about $1.76/MWh on average. Based on this value, all else equal, an average reduction in

transfers of about 60 MW would increase NYC prices by about $1/MWh (100 MW divided by $1.76 times $1 equals 57 MW).

Q. What can you conclude regarding the incentives for National Grid to exercise vertical market power in the event of the merger?

A. National Grid controls critical transmission bottlenecks to southeast New York, including the Hudson Valley, NYC and LI. Reductions in transfer capability due to planned or unplanned outages, or failure to invest in new transmission to increase transfer capability, could significantly increase prices in southeast New York, to the financial benefit of any market-based generation in southeast New York. An average reduction of 100 MW has the potential to increase Ravenswood's prices by about $1.76/MWh, which could increase Ravenswood's net revenues by over $10 million per year (6.4 million MWh times $1.76/MWh equals $11.3 million). The impact on NYC customers would be

even larger, since the higher prices would also benefit other NYC market-based generation.

Impact of National Grid Transmission Constraints on NYC and LI Prices

Q. Does Mr. Schiavone address the impact of National Grid's lines on prices in New York City?

A. Yes. Mr. Schiavone notes that National Grid's lines end at Pleasant Valley, in the Hudson Valley (NYISO Pricing Zone G), where they interconnect with Consolidated Edison (ConEd) lines that carry power from upstate New York into NYC. He observes that the Con Ed lines pass through two additional zones and transmission interfaces before reaching NYC. (Schiavone testimony, p. 7) Finally, he adds that other lines, not owned by National Grid, also reach the Hudson Valley (Zone G) from PJM East, Connecticut, and Zone H (Millwood, in Westchester County). (Schiavone testimony, p.8) He concludes that, "As a result, it seems

reasonable to assume that any indirect influence that actions taken by National Grid can have on generation prices in New York City will be quite limited." (Schiavone testimony, p.8)

Q. What does Mr. Schiavone say about the impact of National Grid's lines on prices in LI?

A. Mr. Schiavone argues that National Grid's lines do not have a major impact on LI prices. He states: "Long Island is remote both geographically and electrically from National Grid lines and facilities. Long Island is dependent on ConEd and New England for its imported power, but, except for some possible stray loop flows, this power does not flow through National Grid lines." (Schiavone testimony, p. 9)

Q. Do you agree with Mr. Schiavone's conclusion that National Grid's lines do not have a major impact on prices in NYC and LI?

A. No, we do not. Wholesale energy (generation) prices in NYC and LI are determined in spot markets operated by the NYISO; the market-

clearing prices reflect the marginal cost of supplying an additional MW of NYC or LI load. As noted above, most generation in NYC and LI is gas-fired or oil-fired plants with relatively high fuel costs. Absent access to upstate and out-of-state resources, the NYISO would have to rely exclusively on very high-cost downstate resources, leading to very high wholesale energy prices. However, National Grid lines provide access to upstate and out-of-state hydroelectric, nuclear, and coal-fired plants with relatively low fuel costs. This permits the NYISO to transfer thousands of Megawatts of power from western New York to the Hudson Valley on National Grid's lines, displacing much of the higher-cost downstate resources. The result is lower wholesale energy prices in NYC and LI.

Q. Mr. Schiavone observes that power can reach Zone G (Hudson Valley) through lines not owned by National Grid, including lines from PJM East, Connecticut, and Zone H (Westchester County).

Are these other lines adequate substitutes for National Grid's lines?

A. No. Zone H is downstream from Zone G, so it is generally on the high-cost side of upstate constraints. Lines to PJM East (New Jersey) and Connecticut connect to regions that, like downstate New York, are largely dependent on relatively high-cost gas- and oil-fired generation; moreover, the lines have limited capacity. Thus the other interconnections to Zone G could not fully compensate for constraints that reduced transfers on National Grid's lines. Finally, PJM East and Connecticut are not part of the NYISO and coordination between them and the NYISO is imperfect, which can limit otherwise-efficient imports, especially on short notice.

Q. Is there a more competitive location in New York than the Hudson Valley (Zone G)?

A. Yes. The Marcy Substation, near Utica, is generally a more competitive location in New York, because it is the junction of major lines

from the north and west, accessing hydroelectric, nuclear, and coal-fired power from upstate New York, Pennsylvania, Ontario and Quebec, as well as major lines delivering power to the east (Albany) and southeast (Hudson Valley). Unlike the Hudson Valley, Marcy is west of the Central East and Total East constraints. Because of its central location, the NYISO uses the price at Marcy as its "Reference Price" for wholesale energy in New York.

Q. Please summarize the impact of National Grid's transmission system on downstate prices.

A. Downstate prices are almost always higher than the reference price at Marcy, due to line losses and transmission constraints encountered by the power transfers from Marcy to downstate loads. The price at each location is the sum of the reference price (marginal cost of energy), marginal line losses, and marginal congestion costs, reflecting the impact of transmission constraints. (The NYISO actually posts

congestion costs to Marcy, rather than from Marcy, so the posted marginal congestion costs in downstate New York are generally negative and must be subtracted from the reference price to calculate the higher downstate price.)

Q. Can you briefly explain marginal line losses?

A. Power lines offer some resistance to the flow of power; this heats up the lines, dissipating some of the power. The NYISO accounts for this by adding marginal line losses to the price, reflecting the cost of the additional line losses incurred by an additional MW of load at that location.

Q. Can you briefly explain marginal congestion costs?

A. Marginal congestion costs refer to the cost incurred to satisfy transmission constraints. As long as power flows are below the limits set by transmission constraints, the NYISO can serve downstate load using the low-cost upstate generation or imports, and marginal congestion costs are zero. However, higher loads tend to

require larger power flows. If the flow on a line reaches its limit, the constraint is said to "bind," and additional load on the downstream side of the constraint must be served by a higher-cost generator on the downstream side in order to avoid overloading the transmission line. The need to suddenly switch from low-cost transfers to higher-cost downstate generation can result in a sudden, large jump in prices on the downstream side of the binding constraint.

Q. Please explain how constraints affect the size of the market.

A. A binding constraint causes the market to split in two, because prices downstream from the constraint reflect the higher marginal cost of downstate generation. Thus if the Central East interface binds, prices in Albany and points south will jump because additional load on the east side of the constraint must be served by additional higher-cost generation on the east side. In that case, Albany will be part of the eastern market. On the other hand, if the

binding constraint is the Leeds-Pleasant Valley line south of Albany, then prices in Albany will remain low (because Albany is on the upstream side of that constraint), and the jump in prices will be limited to the Hudson Valley and points south. In that case, Albany will be part of the western market.

Q. If a binding constraint is downstream from National Grid's territory, can National Grid's transmission still impact downstate prices?

A. Yes. For example, congestion may increase on National Grid's system to the point where it limits transfers below the level at which the downstate lines were constrained. In that case, the binding constraint would move from the downstate line to the upstate line. The additional reduction in transfers would likely cause a further increase in downstate prices.

Q. Is congestion susceptible to the exercise of vertical market power?

A. Yes. Congestion varies with load, generator and transmission outages, transmission investments

and other factors. These features raise the possibility that congestion could be subject to manipulation, for example by altering transmission investments or maintenance, in order to exert vertical market power. This was the second example raised by the Commission's VMP Statement, and is further discussed by Staff's Merger Panel.

Q. Can you give a real-world example of congestion on National Grid lines impacting downstate prices?

A. Yes, we have provided an example as Exhibit ___ (CONSTRAINTS-2). The NYISO posts congestion by location for both its day-ahead and real-time markets. We selected June 1, 2006 because on that day, the NYISO recorded moderate congestion on National Grid's Leeds-Pleasant Valley line in the day-ahead market (run on the morning of May 31) and severe congestion on the same line in the real-time market, due to a ThunderStorm Alert (TSA).

Q. Please briefly explain NYISO's day-ahead and real-time markets.

A. In the day-ahead market, held the morning of the prior day, NYISO schedules generation to serve load at least cost, subject to transmission constraints, based on bids submitted by 5 AM. In the real-time market, the NYISO adjusts the generation to deal with actual (metered) load if different from day-ahead bid load, and to deal with generator or transmission outages that had not been forecast day-ahead. The NYISO calculates day-ahead prices at hourly intervals and real-time prices at 5-minute intervals, based on those same day-ahead and real-time bids. The prices reflect the market-clearing price, i.e. the marginal cost of serving an additional MW of load. These prices vary by location, and so are referred to as location-based marginal-cost prices (LBMPs).

Q. What is a ThunderStorm Alert?

A. A ThunderStorm Alert (TSA) is a reliability rule called by the NYISO when severe thunderstorms

threaten power lines in the Hudson Valley. Normally, the NYISO operates the transmission system with enough spare capacity on the lines to protect against the contingency of the loss of one major facility; this is referred to as "single contingency" operation. However, during a TSA, the NYISO operates the transmission system more conservatively, to protect against the potential loss of two major facilities at once from lightning strikes; this is referred to as "double contingency" operation. Among the facilities at risk are National Grid's lines from Leeds and Athens to Pleasant Valley. The effect of a TSA is to operate the system as if one facility, such as the Athens-Pleasant Valley line, were already out of service. Thus a TSA can illustrate the potential impact on prices of an unexpected outage of National Grid's Athens-Pleasant Valley line.

Q. Please briefly describe the day-ahead prices for June 1, 2006.

A. The chart of day-ahead prices shows that prices increased as load increased, reflecting the need to run higher-cost generators. Prices also increased in the same direction as power flowed, from west (Mohawk Valley) to east (Capital) and down the Hudson Valley to NYC and LI. Notably, from hours 12 to 16 (noon to 5 PM), prices in the Hudson Valley and Ravenswood in NYC jumped well above prices in the Capital zone. This jump was due to congestion on National Grid's Leeds-Pleasant Valley line during those hours of peak load, as shown by the list of day-ahead constraints. Congestion increased the price at Ravenswood by an average of $7.66 per MWh between noon and 5 PM.

Q. Please briefly describe the real-time market for June 1, 2006.

A. During the morning hours, real-time prices generally followed the day-ahead prices. Real-time (actual) loads were above the day-ahead forecast; NYC loads peaked at 9,020 MW, well above the day-ahead forecast peak of 7,931 but

well below the summer peak of over 11,000 MW. Around 11 AM, real-time prices began to rise moderately, to $136/MWh during hour 12 (from noon to 1 PM); at that time there was no congestion to NYC or LI. However, at 1 PM, significant congestion appeared on the Leeds-Pleasant Valley line, and at about 1:15 PM a TSA was called, requiring a reduced flow on Leeds-Pleasant Valley (in case of an outage on the Athens-Pleasant Valley line), as shown by the list of real-time constraints for that day. To reduce the flow on National Grid's lines, downstate generation had to be suddenly increased, while upstate generation was reduced. The chart "Total East Real-Time Flows" shows the resulting reduction of about 1,000 MW in real-time transfers to southeastern New York over the Total East interface. Exh.___ (CONSTRAINTS-2) To accomplish this, the NYISO had to call on expensive downstate generators, leading to a spike in prices south of Pleasant Valley, with average real-time prices exceeding $500 per MWh

for nine hours (1 PM to 10 PM). The congestion component of Ravenswood's real-time prices averaged over $400 per MWh during this period.

Q. What does this example show about the potential downstate price impacts of constraints on National Grid's lines?

A. This example illustrates the fact that National Grid's lines can, in fact, have a major impact on prices in NYC and LI. In the day-ahead market, constraints on National Grid's lines increased prices at Ravenswood in NYC over a 5-hour period by an average of over $7 per MWh. In the real-time market, a reduction in transfer capability due to a TSA, equivalent to the impact of an unexpected outage on National Grid's Athens-Pleasant Valley line, caused severe price increases from the Hudson Valley south to NYC and LI. Real-time prices at Ravenswood increased by over $300 per MWh, from $136 before the TSA to an average of $444 during the TSA (averaged between 1 PM and 10 PM).

Q. Does congestion in New York occur only during summer peak periods?

A. No. While congestion tends to be higher in the summer months, congestion in New York is a daily occurrence, as shown in a graph of bid production cost impacts for 2005 (bid production cost impacts are calculated as the change in generation costs due to congestion). (NYISO: Congestion Impact Update, Electric System Planning Working Group, March 14, 2006)

Q. How large an impact can National Grid's lines have on transfers into NYC?

A. The Central-East interface has a nominal transfer capability of 2,850 MW, while the UPNY-SENY interface has a nominal transfer capability of 5,100 MW. Exh.___ (CONSTRAINTS-1, Table 4.2) National Grid's Leeds-Pleasant Valley line has a transfer capability of 1724 MW (emergency thermal rating), limited by a potential outage on its Athens-Pleasant Valley line. (NYISO: Comprehensive Reliability Planning Process Supporting Document and Appendices for the Draft

Reliability Needs Assessment, Dec. 21, 2005, p. 51, Table 11.1.3) According to the NYISO, an outage on National Grid's Leeds-Pleasant Valley line can decrease transfer capabilities across Total East (which includes the Central East constraint) by 925 MW during summer months and 300-400 MW during winter months. ("New York ISO Transmission facility Maintenance Outage Impact Report," NYISO Outage Scheduling Manual, May 30, 2002, Appendix B)

Q. Can you estimate the potential impact on NYC prices of an outage on Leeds-Pleasant Valley?

A. The potential impacts depend critically on load levels, existing transfers, and the extent to which the outage is forecasted, among other factors. Assuming a forecasted outage reduced transfers by 925 MW, the price impact in the day-ahead market could be about $16/MWh (925 MW times $1.76/MWh per 100 MW equals $16.3 million). Assuming Ravenswood was generating at its average 2005 capacity factor of 30%, its net revenues would increase by about $280,000 per

day (30% times 2,400 MW times $16/MWh times 24 hours/day equals $276,000/day). If the outage was not forecasted, price impacts in the real-time market would likely be higher, because the NYISO would have to rely on even more expensive quick-start resources to replace the lost transfers. The TSA on June 1, 2006, equivalent to an unexpected outage, increased real-time prices in NYC and LI by an average of over $300 per MWh for 9 hours.

Q. What are the current levels of congestion costs in the NYISO's day-ahead markets due to constraints on National Grid's lines?

A. For congestion in the day-ahead markets, the NYISO has reported the costs of "unhedged" congestion; this multiplies the marginal cost of congestion by the amount of load that must be served by the more-expensive downstate generation (i.e. it credits load with the congestion rents it receives from the transfers that do occur). In 2005, unhedged congestion on the Central-East interface cost about $80

million (9.2% plus 2.5% of the 2005 total $685 million), while unhedged congestion on Leeds-Pleasant Valley cost about $119 million (17.3% of the 2005 total $685 million). (NYISO: Congestion Impact Update, Electric System Planning Working Group, March 14, 2006)

Q. What are the current levels of congestion costs in the NYISO's real-time markets due to constraints on National Grid's lines?

A. The NYISO's Independent Market Advisor reported that real-time congestion on Leeds-Pleasant Valley due to TSAs "… accounted for approximately $60 million of the [real-time] congestion costs incurred in the Capital to Hudson Valley corridor." (Potomac Economics, Ltd., Independent Market Advisor to the New York ISO, 2005 State of the Market Report: New York ISO, August 2006, p. 64) The costs of real-time congestion such as caused by unexpected outages or TSAs are in addition to the costs of day-ahead congestion. They represent the cost of expensive downstate generation that must be

purchased in the real-time market to replace cheaper upstate generation. Real-time congestion costs are borne by loads, either as the congestion component of real-time prices or through an extra charge (uplift) added to wholesale prices.

NYISO Oversight of Transmission Maintenance

Q. Could transmission maintenance on National Grid lines raise downstate generation prices?

A. Yes, as admitted by National Grid witness Schiavone:

> "There are only a limited number of ways, even in theory, in which a transmission owner ("TO") like National Grid could withdraw or limit capacity on its upstate transmission system in order to limit power flows into New York City (Zone J) and thus potentially raise generation prices. Hypothetical strategies for withdrawing capacity on National Grid's upstate lines include taking outages or extending outages…." (Schiavone testimony, p. 3)

Q. How does National Grid propose to mitigate such market power?

A. National Grid witness Schiavone argues that such exercise of vertical market power is precluded

by NYISO oversight and control of the New York transmission system, NYISO market monitoring and investigative authority, NYISO penalties for extending scheduled outages under Attachment N to the NYISO Market Services Tariff, FERC-enforced Standards of Conduct, training of transmission staff, and market participants' ongoing scrutiny of transmission operations. (Schiavone testimony, pp. 3-4).

Q. According to Mr. Schiavone, what oversight and control does the NYISO exercise over scheduled outages?

A. Mr. Schiavone quotes the NYISO Agreement, sec. 6.04:

> The ISO shall have the authority to approve or deny all requests for transmission outages on Transmission Facilities Under ISO Operational Control [A-1 facilities] …. The ISO shall be notified of the maintenance scheduled on Transmission Facilities Requiring ISO Notification [A-2 facilities], and shall advise the Transmission Owner of potential adverse reliability impacts in accordance with the ISO OATT.

Q. Does the NYISO oversight and control over scheduled outages preclude National Grid's scheduling an outage to raise downstate prices?

A. No, it does not. The physical operation and maintenance of the transmission system is performed by National Grid and other transmission owners. While the NYISO has authority to deny their requests for an outage, this authority is limited to reliability impacts, not price impacts. Mr. Schiavone admitted this in response to DPS-239, #1.

Q. How does Niagara Mohawk request an outage of a major transmission line?

A. The New York ISO, through market participation, has developed a manual, "The NYISO Outage Schedule Manual," which was approved by the Operating Committee on October 28, 2004. This manual contains the rules by which Transmission Operators and Generators schedule outages of equipment. In the case of a Transmission Operator requesting a facility outage, the manual specifically states that the NYISO "…

coordinates all requests for transmission outages based on their potential impact on system reliability". The manual does not provide for the NYISO to perform any analysis of the impact of the outage on the markets.

Q. What is meant by "system reliability"?

A. The NYISO employs specific reliability criteria consistent with Reliability Rules established by the New York State Reliability Council. These rules include locational capacity requirements that ensure sufficient generating capacity in NYC to supply 80% of NYC peak loads, and on LI to supply 99% of LI peak loads. Because the reliability rules require additional generation downstate to serve load reliably on even the hottest days, the NYISO is generally able to respond to transmission outages (or, in the case of TSAs, by the threat of transmission outages) by further increases in downstate generation, just at higher cost.

Q. Does the enforcement of reliability criteria prevent price increases?

A. No. In general, enforcement of reliability criteria is likely to increases costs and (downstate) prices. For example, in order to prevent an overload on the Leeds-Pleasant Valley line (which would violate one of the reliability criteria), the NYISO will shift generation from lower-cost upstate resources to higher-cost downstate resources. This will tend to increase downstate prices, in the interests of ensuring reliability.

Q. Does the Outage Scheduling Manual provide direction to the NYISO regarding approval of outage requests by transmission owners?

A. Yes. The Outage Manual states:

> … the NYISO will defer, postpone, or cancel requested transmission outages of facilities under NYISO operational control if a contingency on a NYISO monitored facility will result in a reliability criteria violation. Also, the NYISO will defer the requested outage if notification is not received with the minimum notification time requirements. Otherwise, the NYISO will approve the requested outage, or reschedule the outage as agreed to by the requesting TO. (Outage Scheduling Manual, Sec. 1.2.3, Facility Outage Scheduling Procedures, pp. 1-3 to 1-4, emphasis added)

Q. Turning to market monitoring and investigative authority, has the NYISO ever audited a transmission system outage taken by Niagara Mohawk to verify the need for the facilities to be out of service?

A. No, in interrogatory DPS - 253, Michael Schiavone responded directly to the interrogatory that the NYISO has never audited an outage taken by Niagara Mohawk.

Q. What does this mean to the market?

A. It means the NYISO has not performed an analysis of Niagara Mohawk's need to schedule a transmission outage or its impact on the market. As a result, it is possible that Niagara Mohawk could take an outage without anyone from the NYISO auditing the need for the outage or measuring the impact on the market.

Q. If an outage is taken, is there any requirement that the outage be completed as quickly as possible?

A. No. In some cases, transmission owners have worked around to clock to complete outages as quickly as possible, but as that will often increase the maintenance costs, it is not standard procedure. Ownership of a downstate generator would add a significant disincentive to complete an outage as quickly as possible.

Q. Mr. Schiavone states that the NYISO provides penalties for extending scheduled outages under Attachment N to the NYISO Market Services Tariff. Would this adequately mitigate vertical market power?

A. No. Attachment N refers to the allocation among transmission owners of congestion costs and revenues, which are components of their respective Transmission Service Charges (TSCs), a FERC-approved formula rate. The allocation formulas were changed in 2004 to ensure that congestion costs, due to an outage by one transmission owner, are allocated to that transmission owner rather than spread across all transmission owners. While assignment of outage

costs to the responsible transmission owner is desirable, these are not "penalties," but merely part of the calculation of net congestion revenues. Any costs (not "penalties") allocated to National Grid under Attachment N are ultimately flowed through to customers, via an increase in their TSC payments. Because the merged company's transmission function would still be subject to cost-of-service regulation, assignment to shareholders of penalties associated with National Grid's provision of transmission service is ultimately a question of prudence.

Q. Could the maintenance incentives be strengthened simply by setting firm rates, including fixed levels of TSCs?

A. Firm targets for TSC charges would be problematic. First, TSCs are based on embedded costs net of congestion revenues, and transmission owners are subject to cost-of-service regulation. Refusing recovery of higher TSCs could require a finding of imprudence.

Second, a firm target for TSCs could actually lead to perverse maintenance incentives. Transmission owners receive congestion revenues based on the amount of MWs that flow across congested interfaces and the congestion prices across the interfaces (i.e. the difference in congestion price across each interface). If a transmission owner reduced maintenance and consequently incurred greater outages, its MW flows might decline but its congestion prices would likely increase. If congestion prices increase by a larger percentage than the decrease in flows, the transmission owner's congestion revenues would actually increase. Thus firm transmission rates, including fixed levels of TSCs, could actually permit a transmission owner to profit from increased congestion.

Q. Do you have any comments regarding FERC-enforced Standards of Conduct, training of transmission staff, or market participants' ongoing scrutiny of transmission operations?

A. These measures do not adequately mitigate concerns over vertical market power. They only indicate that the exercise of vertical market power, or the suspicion of same, may create significant controversy in future rate cases and prudence proceedings. As the NYPSC said in its Vertical Market Power Statement: "Recognizing that vigilant regulatory oversight cannot timely identify and remedy all abuses, it is preferable to properly align incentives in the first instance." (VMP Statement, Appendix I, p. 1)

Impact on NYISO Governance

Q. Could the NYISO change its rules and procedures to directly control transmission maintenance and investment?

A. No, the NYISO does not have the resources to take over those tasks. The transmission owners physically build, maintain and operate the transmission system; the NYISO relies on the cooperation of the transmission owners to carry out those tasks efficiently. Recognizing this,

the NYISO has attempted to provide financial incentives to transmission owners, such as the maintenance incentives incorporated into Attachment N. However, the financial incentives of Attachment N operate in the context of transmission owners subject to rate-of-return regulation, not market-based generation.

Q. Can National Grid influence the development of NYISO rules and procedures regarding transmission maintenance and investment?

A. Yes. Ms. Saidi has testified that:

> National Grid has strongly supported the following policy initiatives and proposals in the stakeholder processes for the NYISO and the New York State Reliability Council ("NYSRC"), and in numerous regulatory proceedings before the FERC. Each of these policy initiatives and proposals recognize transmission as the critical link to delivering to customers the benefits of electric industry restructuring and are designed to result in improved generation competition and reductions in the overall cost of delivered power. (Saidi testimony, p. 9)

Q. Have National Grid's policy initiatives been influenced by its own financial incentives?

A. Yes. For example, the impetus for maintenance incentives, ultimately filed as Attachment N, was by National Grid, which was concerned that upstate customers were paying part of the cost of downstate congestion. This illustrates the importance of financial incentives in the development of the NYISO market rules and procedures.

Q. How would the proposed merger impact National Grid's financial incentives?

A. Under the proposed merger, National Grid would gain an ownership interest in New York State generators, including market-based generators, which would radically change its financial incentives. The merged company would have the ability and incentives to exercise vertical market power, in order to increase its market-based revenues from downstate generation. Moreover, National Grid's focus on transmission would inevitably be diluted, if not reversed. We could no longer count on National Grid assigning its best employees and resources to

the management of transmission projects or the development of transmission proposals at the NYISO.

Q. Please briefly describe the NYISO's governance process by which its rules and procedures can be changed.

A. The NYISO is a non-profit corporation employing shared governance with its stakeholders. Under shared governance, the development of rules and procedures is carried out in all-parties meetings, and proposals are subject to votes by stakeholders at the NYISO's Business Issues, Operating, and Management Committees. Shared governance was adopted due to the complexity of New York's electric system and the need to carefully coordinate the activities of generators and other suppliers, transmission owners, public power, and end use customers. Each sector is allocated a certain percentage of the votes, designed to balance the competing financial interests of the stakeholders. NYISO rules and procedures must be filed as tariffs

and approved by the Federal Energy Regulatory Commission (FERC). The NYISO can propose tariff changes under FERC Section 205 only with approval of 58% of the votes of the Management Committee. Absent such approval, the NYISO can file proposed tariff changes under Section 206, but faces a much higher burden of proof.

Q. Please briefly explain sector voting at the NYISO.

A. Under the NYISO sector voting, each of the four transmission owners has 5% of the total vote (for a total of 20%), while generators and other suppliers have a total of 43% of the total vote. Public power and end-use sectors have the remaining 37% of the total vote. Approval by the Management Committee requires 58% support, so a proposal can be blocked by opposition of over 42% of the total vote. Note that the combined votes of all generators and other suppliers are barely sufficient to block approval of a proposal at the Management Committee. This was designed to protect sellers

from tariff changes promoted by buyers solely to reduce prices. At the same time, it is difficult for sellers to block proposals designed to improve the efficiency of the market, because buyers may be able to negotiate with one or more sellers to obtain the additional 1% required to pass a proposal.

Q. Are votes at the Management Committee ever close?

A. Yes. Many votes, particularly involving market power mitigation, have been very close, with intense negotiations to achieve the 58% minimum. For example, the NYISO originally had no explicit cap on energy bids; there was only an implicit cap of $9,999.99 per MWh (the largest value that the software accepted). During the first months of NYISO's operation, prices sometimes spiked to those levels not due to true shortages, but simply due to design flaws in the NYISO's rules and procedures. Moreover, it became evident that, at times of true shortages, there was not adequate demand response to limit

prices. This made the NYISO's energy markets very susceptible to market power abuse. To mitigate this, the NYPSC worked with market participants to develop an overall energy bid cap of $1,000 per MWh. After lengthy negotiations, this bid cap was approved by the Management Committee on June 5, 2000 by a vote of 63.15%, including unanimous support from transmission owners, and ultimately was approved by FERC. If just two of the five transmission owners at that time had voted no, the motion would have failed.

Q. How would the proposed merger impact NYISO's governance?

A. The merger would drastically alter National Grid's financial incentives, since shareholders would be the beneficiaries of 100% of the profits of the Ravenswood generators. Thus National Grid's financial interests would become aligned with sellers, in effect increasing the sellers' share to 48%. This would significantly alter the balance of interests at the NYISO

Committees and lower-level working groups, making it much more difficult to develop rules and procedures to deal with market power and mitigation. Moreover, if two other transmission owners were also allowed to own market-based generation, the voting strength of the sectors aligned with sellers would increase to 58%, sufficient to push through tariff changes favorable to sellers without any consideration given to buyers.

Q. Does this conclude your testimony at this time?

A. Yes.