Prepared Statement for Gordon van Welie
US Department of Energy -- Quadrennial Energy Review Meeting
Phoenix Auditorium
Connecticut Department of Energy & Environmental Protection
79 Elm Street, Hartford
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Approximately 1:30 p.m.-2:30 p.m.

Good afternoon. My name is Gordon van Welie. I am the president and chief executive officer of ISO New England. It's our job to operate the bulk power system, plan the transmission system and administer the wholesale electricity markets for the New England region.

I greatly appreciate the invitation to speak here today, and thank the Secretary of Energy and Governor Malloy for their remarks. I believe the Quadrennial Energy Review represents an excellent opportunity for New England to continue our efforts to recognize the energy challenges we face and develop appropriate solutions helpful to New England.

Shift in Regional Electricity Production

Several years ago we recognized that New England was facing a significant shift in the region's electrical energy production – due to the retirement of aging non-gas-fired generation, and a significant increase in gas-fired generation and both grid-scale and 'behind the meter' renewable generation. In 2000, New England received 40% of its electricity from oil- and coal-fired resources. In 2013, oil and coal power plants combined to produce less than 7% of our electricity. During

that same period, natural gas jumped from 15% of our electricity production to 46%.

Along with that shift in electricity production, we see a noticeable decline in the performance of many of the power system resources in New England, leading to even greater reliability challenges.

With major retirements of non-gas-fired power plants starting this year and infrastructure improvements years away, we only have to look at the past two winters to understand the precarious position we are in for the next few years.

Meeting the numerous challenges facing New England will require a significant amount of regional cooperation, and I am hopeful that the Quadrennial Energy Review process will further the efforts being undertaken by the region already.

Winter Operations

I mentioned that New England's experiences the last few winters clearly demonstrate the challenges we face. As we expected, during this past winter, New England faced severe natural gas pipeline constraints that drove gas and electricity prices to record levels. During times when the gas pipelines are constrained, we are heavily dependent on all non-gas-fired generation in the region, and in particular, oil has become a critical fuel during the winter.

Our operating experience this winter revealed that the natural gas infrastructure in New England is *even more constrained* than we previously understood.

Winter Reliability Program and Gas-Oil Price Inversion

To address reliability concerns we experienced last winter, the ISO proposed (and the FERC approved) a $75 million Winter Reliability Program to ensure that oil generators in New England had adequate fuel supplies beginning in December 2013.

Typically, oil-fired power plants are more costly to operate than natural gas plants, so they run infrequently in our markets. However, the high price of natural gas this winter caused a substantial amount of oil-fired power plants to operate economically.

As we anticipated, during times of high demand for natural gas (and severe constraints on the gas pipelines), prices for natural gas increased significantly, leading the region's oil-fired power plants to become baseload energy producers. We knew from the previous winter that a shrinking oil-supply chain makes it difficult for these critical oil-fired power plants to be resupplied in the winter. So the additional oil resources the region procured proved critical to helping us operate reliably through this winter.

These high natural gas prices are symptomatic of the region's severely constrained natural gas infrastructure and the problem will only get worse unless the infrastructure issue is addressed. To give you a sense of the magnitude of these costs, the energy market value for the period December 2013 to February 2014 was $5.05 billion, compared to $5.2 billion for the entire year of 2012 when we had relatively mild weather and the pipelines were unconstrained.

Winter revealed worse pipeline constraints

Unfortunately, this winter revealed that the pipelines into New England are more constrained than we initially understood.

And we're experiencing constraints on *all of the natural gas pipelines* in the region – not just the pipelines from the south and the west that are trying to deliver Marcellus Shale gas.

During the cold period in late January, we observed that even the pipelines from the Maritimes to our north are full supplying residential and commercial heating demand in the region.

While natural-gas-fired generators make up about half of New England's total generation capacity on annual basis, on many cold days this winter, much of the gas-fired fleet was idle because of the lack of gas pipeline infrastructure to meet the demand of those generators.

In order to achieve a more accurate assessment of these challenges, in 2012, ISO New England finalized the first half of a two-part study (undertaken by ICF International) of the natural gas system in New England. The study examined the availability of natural gas supplies during peak natural gas and electric demand periods by estimating pipeline capacity, LNG imports, and any potential peak demand reductions. Among its conclusions, the study noted that New England's natural gas supply infrastructure is not adequate to meet the region's winter power generation needs over the next decade without pipeline expansion. The second phase of the study, completed in 2013, includes two white papers on the impact of natural gas use in eastern New York and New England and examined

potential savings from increased demand side management. Earlier this year, we commissioned ICF International to update their study to reflect the operational experiences observed this winter and to take into account the upcoming retirement of non gas-fired generation on the system. The results are sobering and confirm that, with the exception of some minor relief in the winter of 2016/17 (due to the addition of the Spectra AIM project during 2016), the gas pipeline system constraints are more severe than what was originally forecast in 2012.

We've made it through these past two winters by relying heavily on non-gas fired resources, but as I mentioned previously, that landscape is changing rapidly.

Generator retirements loom

By next winter we will have seen the retirement of a nuclear plant in Vermont and coal- and oil-fired plants in the Greater Boston area (nearly 1,200 MW of generation), which means *fewer* non-gas resources available to our operators. By 2017, we will see the retirement of another large coal- and oil-fired plant in the Greater Boston/Rhode Island area, and this trend seems likely to continue, particularly if gas pipeline constraints are relieved.

In addition, New England's dependence on natural gas will increase further because natural gas is the predominant fuel for the new generator proposals in the region.

Generator performance problems

While more direct infrastructure solutions are being discussed in the region, the ISO is also attempting to address the issue of declining performance amongst

many of our power system resources due to inadequate fuel arrangements or a lack of investment in maintenance and staffing. This presents a continued and worsening challenge to electric reliability.

This is not just an infrastructure challenge; it is due to a problem with the wholesale market design that needs to be remedied as soon as possible.

The solution to this resource-performance problem is to make appropriate changes to the forward capacity market design that will create strong financial incentives for resources that take on a capacity obligation, to provide the system with the required energy and reserves under stressed system conditions. We will measure resource performance under conditions when we are short of operating reserves and settle the difference between what the resource committed to deliver and what it actually delivered. Over-performers will be paid by under-performers who do not fulfill their obligations. This will make the incentive system in the capacity market comparable with the incentive system that already exists in the energy market. It will create a strong incentive for resources to firm up their forward fuel arrangements and make additional capital and staffing investments to ensure good performance. It will also result in the capacity market buying those resources that can best, and most cheaply, meet the region's reliability needs.

We call this "pay for performance" and we filed our proposal in January with the FERC. And while some critics of "pay for performance" have argued that it will harm the oil-fired resources we are relying heavily on now, it will actually provide benefits to those resources that perform well during critical periods.

I believe that public policies driving investment in intermittent and distributed resources, like wind and solar, will increase the need for high performance and flexibility from the balance of the system resources, but will tend to reduce revenues in the energy market. It is therefore *even more important* that we get the right incentives in place through the capacity market to ensure the performance we need to achieve a cleaner electric grid without compromising reliability.

However, we won't see the resource-performance improvements until the rules are implemented in mid-2018. And the pipeline expansion we are discussing likely won't be in service until 2017/18 at the earliest.

New England Governors' Infrastructure Initiative

A few moments ago, I mentioned the possibility of specific infrastructure solutions in New England. As many of you know, in January the New England Governors' requested assistance from ISO New England to ensure that the region benefits from additional pipeline infrastructure, as well as additional electric transmission infrastructure to enable increased levels of renewable and non-carbon-emitting energy on the power system.

The governors' proposal is a creative solution to address the energy challenges facing the New England region. We are appreciative of the governors' efforts and look forward to continuing to support their initiative as they work through the stakeholder process.

Conclusion

In summary, New England has a serious and growing reliability problem due to gas pipeline constraints, a growing resource performance problem, retirements of non-gas generation, and a growing need to balance an increasing amount of intermittent renewable energy.

I am thankful that the US Department of Energy and Secretary Moniz personally, took the time to come to New England today. I am hopeful that the QER process will help achieve a broader understanding of the challenges facing our region and even identify (and support) possible solutions to improve regional electric reliability.

Thank you.