



Memorandum

To: David Gordon, Esq. and Reed Super, Esq.
From: David Schlissel, David White and Geoff Keith
Date: November 3, 2003

Subject: The Impact of converting the cooling systems at Indian Point Units 2 and 3 on Electric System Reliability

We have conducted an independent assessment to examine whether the conversion of the units at Indian Point to closed-loop cooling systems would adversely affect electric system reliability. As we explain below, the answer is an unqualified no: the conversions would not negatively impact the reliability of the New York electric system.

Long-Term Capacity Losses

The Indian Point units can be expected to lose some capacity as the result of the retrofitting of cooling towers and conversion to a closed-loop cooling system. The study by Enercon Services provided to the DEC Staff by Entergy (“the Enercon Study”) claims that each unit will lose approximately 26 MW of net output due to increased parasitic loads associated with the pumps and other components of the closed-loop system.¹ The Enercon Study also claims that each unit would lose capacity due to the increase of back pressure on the turbine in the closed-loop system. According to the Enercon Study, this lost generation would be approximately 47 MW at maximum load conditions for Unit 2 and approximately 27 MW for Unit 3.² Thus, the total capacity loss for Indian Point 2 would be about 73 MW and the total capacity loss for Indian Point 3 would be about 53 MW.

On the basis of an assessment by Powers Engineering, we believe that Enercon’s claimed figures significantly overstate the net plant capacity that would be lost due to the conversion of the Indian Point units to closed-loop cooling systems. However, even the

¹ *Economic and Environmental Impacts Associated with Conversion of Indian Point Units 2 and 3 to a Closed-Loop Condenser Cooling Water Configuration*, Enercon Services, June 2003, at page iii.

² *Economic and Environmental Impacts Associated with Conversion of Indian Point Units 2 and 3 to a Closed-Loop Condenser Cooling Water Configuration*, Enercon Services, June 2003, at page iii.

relatively minor capacity losses claimed in the Enercon Study would not adversely affect electric system reliability in New York State.

For example, the New York Independent System Operator (“NYISO”) estimates that there will be 45,523 MW of capacity available to serve loads during the summer of 2008.³ The peak load for this summer is projected to be 33,410 MW. This means that there will be 12,143 MW of total reserve capacity above that needed to serve loads.⁴ Although the amount of total reserve capacity may decrease over time as load grows (unless new generating facilities are added to the electric system after 2008), the NYISO projects that the system will still have more than 6,500 MW of reserve capacity as late 2015.

These substantial amounts of reserve capacity represent generating units that would be available during peak load periods in case system loads are higher than expected or if other generating facilities are not available to serve loads due to planned or unplanned outages or deratings. The 73 MW and 53 MW capacity losses for Indian Point Units 2 and 3 claimed in the Enercon Study clearly are insignificantly when compared to the 12,143 MW of reserve capacity that is projected to be available during peak load periods in New York in 2008 or the 6,500 MW of reserve capacity that is projected to be available in peak load periods in 2015. Consequently, these insignificant long-term capacity losses would have no adverse impact on electric system reliability.

Long-Term Power Plant Operating Performance

We have seen no evidence that power plants with closed-loop cooling systems have longer or more frequent outages than units with once-through cooling. We also have seen no evidence that power plants with closed-loop cooling systems have higher forced outage rates. Consequently, there is no reason to believe that the conversion of the Indian Point units to closed-loop cooling systems will adversely impact system reliability due to the reduced availability of these units.

Short-Term Unit Outages

Analyses by Powers Engineering suggest that there may not be any need for short-term outages of the Indian Point units, beyond normal refueling outages, in order to complete simple cooling system conversions and hook up the new cooling towers and related components. However, some short-term outages may necessary to complete the conversion of the Indian Point units to closed-loop cooling systems if more substantial retrofits are undertaken. Such outages can and should be scheduled for the non-summer months. This would reduce Entergy’s lost revenues due the outages and would minimize the impact of outages on electric system reliability in 2008, the year in which Entergy estimates it would complete the tower retrofits.

³ All of these figures are taken from Table V-2 on page 60 of NYISO’s *2003 Load & Capacity Data Report*.

⁴ As shown on Table 1, this represents a system reserve margin of 30.4 percent, significantly higher than NYISO’s required 18 percent reserve margin.

However, to be conservative, we have investigated the impact that the simultaneous shutdown of both Indian Point units during the peak load periods of the summer of 2008 would have on electric system reliability. The results of this investigation are shown on Table 1 below:⁵

Table 1: Impact of Simultaneous Indian Point Outages

	Winter 2007/2008 Peak (MW)	Summer 2008 Peak (MW)	Winter 2008/2009 Peak (MW)
Total Electric System Capability	46,807	45,553	46,782
Less IP2 & IP3 Capacity	1,994	1,975	1,994
Net Electric System Capability	44,813	43,578	44,788
System Seasonal Peak Demand	25,040	33,410	25,260
System Reserve Capacity	19,773	10,168	19,528
System Reserve Margin	79.0%	30.4%	77.3%

The New York State Reliability Council and the NYISO have determined that New York State needs an 18 percent reserve margin.⁶ Clearly, this reserve margin requirement would be met during the winter 2007/2008, summer 2008, and winter 2008/2009 peak periods even if both Indian Point units were unavailable due to the conversion to closed-loop cooling systems. The New York State electric system would have a 30.4 percent reserve margin without Indian Point even during the peak summer period in 2008.

The figures in Table 1 reflect the addition of the new generating facilities that had been approved by the New York State Board on Electric Generation Siting and the Environment (“the Siting Board”) through the end of 2002.⁷ This is a reasonable assumption because almost all of these facilities are either under construction⁸ or are

⁵ The source of the figures in Table 1 is NYISO’s 2003 Load & Capacity Data Report.

⁶ For example, see the NYISO’s *2003 Load & Capacity Data Report*, at page 2.

⁷ The figures in Table 1 do not reflect the additional capacity that would be available from the Astoria Repowering Project or the Spagnoli Road facility. Both of these facilities have been certified by the Siting Board in 2003. For this reason, the figures in Table 1 are conservative. Table 1 also does not reflect the completion of the Cross Hudson cable which has been approved by the New York State Public Service Commission. The completion of this cable will make PSEG Power’s 550 MW Bergen facility a part of the New York State and New York City electric system.

⁸ Athens, Bethlehem Energy Center, East River Repowering Project, Ravenswood Cogeneration Project and the NYPA Poletti Expansion Project.

almost certain to be built because the plant owners have entered or are likely to enter into long-term contracts to sell the plant output.⁹

However, some of the units that have been certified by the Siting Board may not be built by 2008. To evaluate the effect of such delays, we have evaluated the impact that the simultaneous outage of both Indian Point units would have if two of the new plants that have been certified by the Siting Board are not available in 2008. The results of this sensitivity analysis are shown in Table 2 below.

Table 2: Fewer New Generating Units Sensitivity Scenario

	Winter 2007/2008 Peak (MW)	Summer 2008 Peak (MW)	Winter 2008/2009 Peak (MW)
Total Electric System Capability	46,807	45,553	46,782
Less IP2 & IP3 Capacity	1,994	1,975	1,994
Less Capacity that would have been provided by delayed projects	1,290	1,290	1,290
Net Electric System Capability	43,523	42,288	43,498
System Seasonal Peak Demand	25,040	33,410	25,260
System Reserve Capacity	18,483	8,878	18,238
System Reserve Margin	73.8%	26.6%	72.2%

Thus, New York State would have more than adequate capacity reserves with both Indian Point units out of service due to conversion-related outages even if two of the facilities that have been certified by the Siting Board are not completed by the winter of 2008/2009 and even if the conversion-related outages extend into the peak summer months.

The NYISO also has a requirement that there be enough generating capacity within New York City to serve 80 percent of the projected in-city peak loads. This requirement would not be affected by any short-term outages of the Indian Point units during the peak or non-peak periods in 2008 because neither of these units is located in New York City.

In fact, as shown on the following table, New York City will have more than enough in-city capacity to meet the NYISO's 80 percent in-city requirement in 2008. There also will be a more than adequate 32 percent capacity reserve margin in New York City

⁹ SCS Astoria Energy and ANP Brookhaven.

during that same peak period whether or not the Indian Point units are shutdown for short-term cooling system conversion-related outages.

Table 3: New York City Electric System in Summer Months of 2008

Year	Projected NYC Peak Loads	Installed Capacity in NYC	Import Capability	Total Capacity	Reserve Margin	Installed in-City Capacity as % of Projected Peak Demand
2008	11,935	10,690	5,120	15,810	32.5%	89.6%

The installed capacity figures in this table are somewhat conservative because they only reflect the new capacity that will be added by the three facilities that are currently under construction in New York City (i.e., Ravenswood Cogeneration Project, NYPA Poletti Expansion Project, and the East River Repowering Project) and the SCS Astoria Energy facility which is very likely to be built because SCS Astoria has recently entered into a contract to provide 500 MW of power to Con Edison for ten years starting in 2006. The amount of capacity installed in NYC in 2008 will be even higher than is shown in this table if Reliant’s Astoria Repowering Project and PSEG Power’s proposed Cross Hudson Cable, both of which have approved by the appropriate regulatory agencies, also are considered.

In addition, there are another four new transmission line projects to bring power to downstate New York that could be in place by 2008. Pegasus Power Systems’ Niagara Reinforcement Project would move 1,200 MW to 1,800 of power from northern New York, Ontario, or Quebec to New York City and another 1,200 MW to PJM.¹⁰ Conjunction LLC also has proposed a 2,000 MW transmission line, the Empire Connection, from Albany County, to New York City.¹¹ The proposed in-service date for this line would be 2006. Finally, proposals have been advanced to add cables that would carry 600 MW of power from Sayreville, NJ, to Con Edison’s West 49th Street Substation and another 600 MW of power to Long Island.

¹⁰ “New proposed merchant line would move up to 3,000 MW to New York City, PJM,” Electrical Utility Week, October 13, 2003, at page 5.

¹¹ “New Merchant T-Line Unveiled in NY,” The Electricity Daily, September 15, 2003.