Chronology/Background Information for the
Proposed Repowering of the Cayuga Power Plant

Prepared by Community Environmental Defense Council, Inc.

Late 1800's
Thomas Edison invents the Edison System – the electric utility and electric power systems are isolated central stations which serve small pockets of customers and each power system operates independently of the others using direct current technology which can only transport electricity short distances. George Westinghouse extended the reach of the Edison System by incorporating alternating current to transport power over longer distances. Samuel Insull developed the strategy of operating larger generators around the clock introducing economies of scale that he called "massing production" (later mass production, thereafter Henry Ford picks up the term).

1887
Congress establishes the Interstate Commerce Commission (ICC), the first national regulatory body, in order to regulate the railroads. Thomas Insull suggests using the ICC as a model for state regulatory boards to regulate the electric utilities (given the trouble electric companies were having negotiating franchise agreements at the local level). The ICC was comprised of five full-time regulators, chosen for their impartiality and were charged with setting the maximum allowable rates that were "reasonable and just." The ICC becomes the model for state level electric utility regulation.

1907
Massachusetts, New York and Wisconsin form the first state electric utility boards. In New York, the New York Public Service Commission is created by statute and the Legislature abolishes the Board of Railroad Commissioners that had prior to that time regulated common carriers. The PSC's jurisdiction extends to common carriers and electric and gas corporations.

Utility regulation is justified under two concepts. The first is that utilities have a monopoly over the geographic area they control. The second is that the service provided is deemed to be "affected with a public interest." Electricity is essential to the functioning of modern society. Regulation is designed to ensure that sufficient generating capacity is available at all times.

Building power plants and operating and maintaining transmission lines and distribution stations are extremely capital intensive and limits entry into the market. Further, as a utility increases in size it benefits from economies of scale and it is difficult for smaller producers to compete. Finally it is wasteful and illogical to have multiple sets of electric transmission lines running to each consumer of electricity.

In return for protecting the investment of the utilities in power plants and transmission systems (legalized monopolies), the regulatory boards assume control over significant aspects of the utilities' operations. The board sets the rates, determines profit levels, and approves capital investments.

1915
When electric demand exceeds supply, the generation plant and transmission equipment can shut down which lead to service interruption or a blackout. To reduce the risk of such failures, and particularly during the first world war, electric utilities begin to interconnect their networks to provide multiple redundant alternative routes for power to flow should weather or equipment failures occur.

By allowing multiple generating plants to be interconnected over a wide area, the cost of producing electricity was reduced. The most efficient plants could supply the base load and stand-by power could be provided by less efficient plants when demand (load) required. With limited cost-effective energy storage capabilities on the power system, electric energy has to be produced precisely at the time it is needed.

Some grids become densely interconnected (Pennsylvania, New Jersey and Maryland Power Pool) while others are poorly interconnected and suffer from transmission bottlenecks (New York City) as "electrical islands."

1920
Congress establishes the Federal Power Commission (FPC), which ultimately becomes the Federal Energy Regulatory Commission (FERC).

1935
Congress passes the Federal Power Act.

1938
Congress passes the Natural Gas Act and grants FPC the power to regulate the sale and transportation of natural gas.

1955
The Unit 1 of the Cayuga coal power plant is entered into service with a net capacity rating of 154 MW.

1958
Unit 2 at the plant is entered into service with a net capacity rating of 158.7 MW.

1965
The electric system is comprised of generation, transmission, distribution, and load. Load is defined by the U.S. Energy Information Administration as "the amount of electric power delivered or required at any specific point or points on a system. Load originates at the energy consuming equipment of the consumer." The first

three functions (generation, transmission, and distribution) are the functions of the electric utilities.

At this point in time, electricity continues to be supplied by large vertically integrated investor owned monopolies that operate the power plants as well as the transmission lines for power distribution to end users.

Electric power systems are increasingly interconnected and are organized into three main interconnections, the Eastern Interconnection, the Western Interconnection, and the Texas Interconnection. There are specialized connections between these three interconnections forming an electric grid servicing the lower 48 states and much of Canada. The upside of these interconnections is efficiency and redundancy in power supply. The downside is the possibility of cascading faults that can cause a massive blackout.

Following the 1965 Northeast Blackout, numerous measures were instituted to avoid repetition of the problem. Reliability councils were formed to establish standards and improve coordination between electricity generators. Northeast Power Coordinating Council (NPCC) covers the area affected by the 1965 blackout and establishes regional reliability standards. New York States goes one step further and establishes the New York Power Pool (NYPP) as a voluntary collaboration of the utilities and power authorities in New York State.

The New York power industry pioneers capacity planning and institutes a requirement of "Installed Reserve Margin" (IRM) representing the amount of generating capacity that must be in place to maintain resource adequacy. It is measured by the amount of generation and other capacity resources above 100 percent of forecasted peak load that must be available to serve all customers without interruption.

1967
Intrastate electric utilities become subject to FPC's jurisdiction if they connect they supply lines to out of state power lines.

1968
The North American Electric Reliability Council (NERC) is formed by the electric utility industry to promote reliability and adequacy of bulk power transmission. NERC is overseen by the FPC.

Since electricity cannot be routed, the electrical system must be monitored in real-time, 24/7/365, by NYPP to ensure a consistent and ample supply of electricity. NERC develops balancing standards and guidelines for the loads and generators that are managed by NYPP.

1977
Congress reorganizes FPC as the Federal Energy Regulatory Commission (FERC).

1980's
Utilities tend to overinvest in generating capacity because under the system of ratebase regulation, utilities received more or less automatic and guaranteed returns on whatever amount they invested which led to overinvestment, particularly in large, expensive power plants. In 1982 the reserve margin, the capacity of unused capacity in the United State's grid reaches 41% (meaning that 2/5 of generating capacity sat idle on the peak day of energy usage).

1992
The New York State legislature adopted Article 6 of the New York Energy Law and created a State Energy Planning Board responsible for formulating a State Energy Plan (SEP).

The State legislature also enacted various amendments to the Public Service Law and the Energy Law to strength and focus upon the interconnectedness of the economy and the environment. Section 66-i acknowledges that investing in supply-side resources often powered by environmentally damaging fossil fuels may not be the most cost-effective, environmentally wise means of meeting future generating capacity needs. Three recurring themes in the factors that electric utilities must consider in deciding how to meet future energy needs are (1) environmental protection; (2) economic competitiveness, and (3) public welfare.

1996
FERC issues orders (888 and 889) opening access to the nation's transmission grid and encouraged the creation of "independent" entities to administer wholesale energy markets. FERC is an independent governmental agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects.

NY Public Service Commission (PSC) regulates investor-owned utilities that distribute electricity to end-users. The PSC is charged with ensuring safe, secure and reliable access to electric, gas, steam, telecommunications, and water services for New York's residential and business consumers, at just and reasonable rates.

PSC orders (PSC Order No. 96-12) the "unbundling" of electric supply and delivery, strongly encouraging (and providing financial incentives for) utilities to divest their generation and open access to transmission to all qualified parties.

The PSC directs that a non-bypassable systems benefit charge be established to support investments in energy efficiency, research, development and demonstration, low income programs and environmental monitoring that might not be fully supported in a competitive market. PSC designates NYSERDA as the administrator of the system benefit charge program.

Opening the electric utility market to competition and marke forces is believed to reduce the need for regulatory oversight of utility operations.

1998-1999
New York State's competitive wholesale electricity markets are opened. FERC approves the New York Independent System Operator (NYISO) and the New York Power Pool's responsibilities are officially transferred to NYISO and it begins to manage the bulk electricity grid. NYSIO is charged with three overriding responsibilities: (1) maintaining the safe and reliable operation of New York's bulk power system; (2) operating fair, non-discriminatory and effective wholesale electric markets; (3) planning for the reliability and economic needs of the state's bulk power system. While the focus of the bulk power system is generation and transmission, the system also includes the capacity market and capacitors, transformers and other additional components called "ancillary services."

The energy market moves from a regulated monopoly to new wholesale electricity markets between generators of electricity, owners of the "grid" (the utility companies) and very large consumers of electricity (major industrial users).

Separately in the retail utility market, a single company remains responsible for the transmission and distribution grid (in our area NYSEG) (but is no longer responsible for generation of electricity and most utilities divest their generation facilities). Residential consumers can now purchase their electricity either through the company that owns the transmission and distribution grid or an independent electricity company ("ESCO" or energy service companies).

The independent electricity companies transmit and distribute their power through the transmission grid, and all consumers pay the owner of the transmission and distribution system (locally NYSEG) for the use, maintenance and upgrade of that system regardless of the company they choose to buy their electricity from.

Compliance with NERC guidelines becomes mandatory and those guidelines become the "NERC reliability standards."

NERC designates "Balancing Authority Areas" for purposes of its "Reliability Functional Model." The geographic area of New York State is referred to as the "New York Control Area" (NYCA). NERC approves NYISO as the Balancing Authority, Interchange Authority, Planning Authority, Reliability Coordinator, Resource Planner, Transmission Operator, Transmission Planner and Transmission Service Provider for the NYCA. As such, NYISO has primary responsibility for the bulk electric system planning and operations, as well as administration of the markets for energy, capacity and ancillary services.

NERC (and FERC) delegate certain reliability responsibilities to the NPCC.

Pursuant to the Federal Power Act, the State of New York may promulgate and enforce reliability standards that are more specific and/or stringent than NERC or NPCC standards. FERC approved formation of the New York State Reliability Council (NYSRC) to create more stringent reliability rules that address New York State's unique energy grid issues. NERC imposes on NYISO the obligation to meet all applicable NERC, NPCC and NYSRC reliability rules by developing tariffs, procedures and manuals to effectuate these rules. NYISO and NYSRC enter into an agreement detailing the parameters of their relationship.

NYISO enters into an agreement with the investor-owned transmission owners (including NYSEG),

NYISO conducts clearing price auctions between generators of electricity (must produce 1 MW or more) and wholesale customers (must purchase 1 MW or more) where all suppliers receive the same market-clearing price which is set at the offer price of the most expensive resource chosen to provide supply. (In contrast a pay as bid auction, the supplier would be paid based on their actual bid.) This windfall in price paid to all but the highest offering seller is referred to as a "Producers' Surplus." (Not all independent service operators use the market clearing auction format – there are competing designs for energy markets.) There are two auctions for the actual sale of electrical power – the day-ahead auction and the real time market.

NYSIO also supports bilateral contracts (direct sale of energy between two parties) that are negotiated outside of the marketplace by providing a bid system to make transmission services available. Almost half of all power is sold in bilateral contracts.

NYISO operates electric power capacity market. The capacity market is designed to ensure that sufficient capacity is available to reliably meet particularly high demand.

NYSIO operates the ancillary services markets for regulation and operating reserve and cost-based services of voltage support and black start capacity. Reserves are energy generation resources that are available to provide fast ramping power in the event of a unit or line trip. NYSIO maintains varying levels of reserves in different parts of the state. Regulating resources are energy generation sources and consumers that can quickly adjust their output/consumption to respond to changing load conditions.

There are also financial markets that NYSIO coordinates which do not involve the actual sale and delivery of energy. These markets sell transmission congestion contracts where one party agrees to be obligated to pay another party for congestion within the system, and arbitrage (virtual) contracts where participants virtually buy power at the say ahead price and sell power at the real time price. NYSIO believes these virtual markets increase market efficiency.

The electricity markets continue to operate in this fashion to the current day.

1999
NYSEG divests from electricity generation and sells the Cayuga power plant to AES Energy Corp. (AES) along with five other plants. AES sets up a subsidiary, AES Cayuga LLC to operate the Cayuga plant.

2000's
As the electric markets become open to competition, it becomes increasingly clear that the transmission system that served vertically integrated operations does not have sufficient capacity to support long distance transmission of bulk power. Bottlenecks and congestion increase costs to consumers and increase the chance of blackouts. (National Transmission Grid Study, US Dept. of Energy, 2002, Executive Summary)

2005
The PSC establishes policies and procedures for power plant retirements, including a requirement that power plant operators provide the PSC with 180 days notice of their intent to mothball a plant (Case 05-E-0889).

The Energy Policy Act of 2005 mandates compliance with NERC standards. The Energy Policy Act of 2005 also gives FERC additional responsibilities to protect the reliability of the high voltage interstate transmission system through mandatory reliability standards. NERC develops these standards with opportunity for public comment.

2006
Under provisions of the Energy Policy Act of 2005, FERC certifies the North American Electric Reliability Corporation (NERC) the "Electric Reliability Organization" in the United States. NERC has the legal authority to enforce reliability standards with all users, owners, and operators in the United States. Compliance with these standards is mandatory.

PSC, by order dated February 6, 2006, adopts in their entirety the reliability rules established by NYSRC. The PSC also has the authority to direct a Transmission Operator to develop a plan to mitigate any deficiency, including construction of additional generating facilities and infrastructure necessary to serve the public interest.

2007
Spanish company, Iberdrola purchases NYSEG.

March 2011
AES announces it wants to sell Cayuga along with three other plants.

December 30, 2011

AES files for bankruptcy.

January 4, 2012
Gov. Cuomo's State of the State Address One initiative outlined in the address is the "Energy Highway" System to Power New York's Economic Growth. The Energy Highway system's purpose is to ensure a cost efficient and reliable supply of power is available to fuel the state's economic growth. Gov. announced a plan to build a private sector funded $2 billion "Energy Highway" system that will tap into the generation capacity and renewable energy potential in Upstate and Western NY to bring low-cost power to meet the tremendous energy needs in Downstate New York. The plan also calls for the repowering of old and dirty plants to stop pollution in urban neighborhoods.

January 25, 2012
NERC proposes and FERC issues a proposed rulemaking notice establishing a bright line distinction between the terms "bulk electric system" (BES) and "bulk power system" (BPS). BES constitute all transmission facilities 100 kV and above. BPS constitute facilities that, if lost, could have significant adverse impacts outside the local area where the disturbance occurs.

Between January and April 2012
Energy Highway Task Force is appointed
Gil Quiniones, President and CEO of NY Power Authority
Joseph Martens, DEC Commissioner
Kenneth Adams, CEO of Empire State Development
Garry Brown, Chairman PSC
Francis Murray, Jr., President CEO of NYSERDA

April 11, 2012
The Energy Highway Task Force issues a Request for Information seeking proposals in support of an energy highway that would simultaneously promote clean energy supplies, job creation and economic growth. Responses due May 30, 2012.

May 30, 2012
Task Force accepts 130 ideas from 85 entities on the "energy highway." Upstate New York Power Producers responds.

May –October 2012
Task Force reviews the ideas and develops an action plan to modernize our energy highway, with a focus on improving safety and reliability, making the grid more efficient, improving the environment and lowering costs for consumers.

May 2012
A group of bondholders (Upstate New York Power Producers) agrees to purchase the Cayuga facility and another facility in Somerset (Niagara County) out of the bankruptcy estate for a cash payment of $5,000,000 and a credit against their

bonds/leveraged debt of $300 million. Upstate New York Power Producers sets up a subsidiary, Cayuga Power Plant LLC, to run the Cayuga plant. There were originally twelve bondholding entities, and the identities of five of the participants are Carlyle, J.P. Morgan, Standard General, Marathon and CalPERS.

June 8, 2012
FERC approves AES's application for permission to transfer generating assets to Cayuga.

July 20, 2012
Cayuga Power Plant LLC notifies the PSC, NYISO, and the local transmission and distribution utility (NYSEG) to which the plant is interconnected and whose service territory the facility is located of its intention to mothball the Cayuga plant in six months (January 2013).

"Cayuga Operating Company intends to take all steps within its control to avoid permanently retiring the facility by continuing to explore any and all alternatives with its suppliers and other parties, including reductions in its variable and fixed costs."

July 25, 2012
Department of Public Service (the staff arm of the PSC) requests that NYSEG and NYISO work together to analyze the effects of the Cayuga mothballing on the reliability of the electric system.

August 24, 2012
In its analysis of the reliability impacts of the Cayuga mothballing, NYSEG identifies a thermal overload on the #972 line (Elbridge to State Street) that would occur if the Cayuga plant were not in operation.

NYSEG and Cayuga entered into an RSS Term Sheet whereby Cayuga would provide reliability support services to NYSEG to maintain system reliability until system reinforcements can be implemented.

August 2012
The power plant operators blame the problems faced by the Cayuga plant on the Regional Greenhouse Gas Initiative. They believe that Cuomo's "Energy Super Highway" is their best bet. "We need diversity. We don't want coal to be forgotten."

September 28, 2012
PSC issues a *Notice Directing Filings and Soliciting Comments in the Petition of Cayuga Operating Company LLC to Mothball Generating Units 1 and 2* in Case 12-E-0400.

October 22, 2012
New York Energy Highway Blueprint is presented to Gov. Cuomo

Recommends 13 actions to advance Gov. Cuomo's initiative to modernize New York's statewide energy system and modernize New York's aging infrastructure for the future.

Primary concern – "construction of the new transmission capacity called for under the Blueprint would solve a decades-old problem: the limitation of the State's electric grid to transmit available, cheaper upstate power to downstate when demand is high." (NYEHBP, p. 13)

Relevant action item: "Develop and implement Reliability Contingency Plans to prepare for potential large power plant retirements." – Lead Public Partner – DPS (NYEHBP, p. 20)

"Excess power is available in upstate New York, while demand is increasing in the downstate area. The construction and operation of power plans is less expensive in the upstate region as compared to downstate." (NYEHBP p. 28)

"The Energy Highway initiative leverages ongoing replacement in-kind of aging infrastructure and identifies specific areas to expand transmission capacity to move excess power from upstate power producers to downstate" (NYEHBP, p. 37)

"The reduction of in-state transmission constraints and development of additional transmission capacity is expected to reduce air emissions in the New York City area, support the development of upstate renewable energy projects, and lower wholesale energy prices for downstate energy consumers. Further, upgrades should provide economic development for upstate by enabling upstate power plants to reach downstate markets, improving the financial viability of existing upstate power producers, and allowing existing and new wind farms and other renewable sources in that region to access higher priced energy markets. (NYEHBP, p. 39)

"More than 40 percent of New York's existing power generating capacity is over 40 years old and more than 20 percent is over 50 years old. Recent and pending environmental regulations coupled with low natural gas prices could lead to accelerated retirement of some of these older facilities. The potential retirement of power plants creates uncertainties for the future of the State's power supply. The Energy Highway Task Force recommends action to address two critical aspects of this uncertainty. The proposed closure of power plants that are required to maintain system reliability can potentially impose additional costs on customers when the closing plant must be kept online at above market prices. Either by virtue of plant size, location, or uncertainties regarding the timing of potential retirements, the electricity market may not be in a position to respond adequately to the shutdown of certain power plants once retirement is announced….These realities justify enhancements to the current process for managing power plant retirements. In most cases to date, the market responded adequately to the retirement of plants by providing any needed capacity… New York has a regulatory process for managing power plant retirements, once the retirement is formally announced, to ensure that

system reliability is maintained. The State currently requires a power plant operate to provide six month's notice to system operators of its plans to temporarily cease operations (also referred to as mothballing) or to completely shut down and retire. Both NYISO and the utility that owns the transmission system surrounding the retiring power plant evaluate whether the pending loss of capacity would result in adverse reliability impacts. Under the existing process, if negative impacts are identified, the local transmission owner proposes investments in its transmission and/or distribution systems to solve the potential problem. In cases where reliability is at risk from the pending retirement, the power plant and utility may negotiate a Reliability Support Services contract, at above market rates, to keep the power plant operating until the alternate solution is implemented. …" (NYHEBP, pp. 42- 44)

"The Energy Highway Task Force recommends that DPS require affected electric utilities to perform analyses of pending or potential power plant retirements specifically focused on the opportunity to repower the subject plants as an alternative to closure or system upgrade, where a plant is needed for reliability reasons. There are multiple pending power plant retirements in New York State where this analysis can be immediately undertaken, including NRG Power Marketing's coal-fired Dunkirk facility and AES Eastern Energy's Cayuga coal-fired power plant. The affected local utilities should evaluate potential replacement options for the retiring facilities, including repowering the existing power plant with a new plant, and transmission and distribution upgrades. The analysis should include economic development, environmental, and customer impacts of each evaluated alternative." (NYHEBP, p. 77)

"The Energy Highway Task Force supports public policy to address community need [for jobs and tax revenues], but does not support keeping uneconomic power plants online if they have not been deemed necessary for reliability purposes. (NYHEBP, p. 78)

"To address the issue of community impacts from retiring power plants and also encourage improvements in operating power plants, the Energy Highway Task Force recommends that NYSERDA and CED consult with ESD, DPS, and other appropriate agencies to develop plans by the summer of 2013 for these two initiatives: a Community Support Plan and a Greenhouse Gas Emission Reductions Program. …The purpose of the Community Support Plan is to mitigate the near-term strain on communities that demonstrate significant hardship arising from the retirement of a fossil-fuel power plant. (NYHEBP, p. 78)

December 17, 2012
PSC approves the terms of a Reliability Support Services Agreement (RSS) between Cayuga and NYSEG and allows for the pass through of all RSS costs through its Non-Bypassable Charge in Case 12-E-0400.

RSS would be procured from Cayuga for 312.5 MW for one year ending January 15, 2014.
NYSEG would continue to procure RSS after this if necessary.
NYSEG would pay Cayuga a fixed price charge of $2431288 per month totaling $29176656 over 12 months. In addition, NYSEG would fund certain capital expenditures up to $4325000 and NYSEG would pay one half of the study that was filed in November. And NYSEG would reimburse Cayuga for the cumulative incremental forced outage repair costs in excess of $450000.
Any ICAP revenue received by Cayuga would be credited against the monthly payment.
Cayuga retains combined energy and ancillary service revenues up to $7 million and after that proceeds split evenly.
If the facility stays open past January 2014, then Cayuga reimburses NYSEG for half the capital expenditures paid for by NYSGE at the rate of 20% per year for five years.

The cost of the RSS is passed on to all ratepayers in the NYSEG district as a transmission and distribution cost regardless of whether NYSEG supplies their electricity.

January 17, 2013
PSC institutes *Proceeding on Motion of the Commission to Examine Repowering Alternatives to Utility Transmission Reinforcement* (Case 12-E-0577.)

Feb 19, 2013
NYSEG solicits a bid from Cayuga for the level of out-of-market support Cayuga would require to finance a repowering of the Cayuga generating facility. NYSEG will consider Offers to (1) retrofit the existing coal fired boilers to burn natural gas; (2) install new natural gas fired combined cycle combustion turbines (CCCT); (3) install new natural gas fired combustion turbines ("Peaking Generation"); (4) other non-coal fired generators.

February 28, 2013
Cayuga filed a notice to withdraw its Federal Power Act Section 205 filing and proposed reliability must-run agreement.

March 2013
State budget includes provision that states "It is in the public interest to develop clean power generation, near energy demand to meet the needs of ratepayers, to support local and state tax revenue stability, to promote economic opportunity, and to enhance the state's environment."

In the repowering case (Case 12-E-0577) Cayuga submits its Cayuga Repowering Proposal to NYSEG. The Proposal contains four proposed repowering options, all centering on conversion to natural gas.

April 2013
Energy Highway Task Force provides an update and disbands and responsibility for implementing the NYEHB to state agencies.

May 10, 2013
The Independent Power Producers of New York, Inc. (IPPNY) files a formal complaint against the NYISO pursuant to Sections 206 and 306 of the Federal Power Act. IPPNY alleges that the NYISO Market Administration and Control Area Services Tariff is unreasonable and unjust. (FERC Docket EL13-62-000)

May 17, 2013
NYSEG files its Report on the Cayuga Repowering Analysis (see case log at PSC Case 12-E-0577.) NYSEG requests that the PSC approve the new transmission line and disapprove the 4 alternative repowering options suggested by the Cayuga power plant. Furthermore, NYSEG requests that the transmission line project proceed whether or not the repowering proposal proceeds. (Report, p. 1)

May 30, 2013
NYISO answers the IPPNY Complaint (FERC EL13-62-000). The Electric Power Supply Association files a Comment in support of the IPPNY Complaint.

May 31, 2013
In the PSC case for the new transmission line (PSC 13-T-0235) NYSEG and National Grid file a joint application with the PSC for a *Certificate of Environmental Compatibility and Public Need under Article VII of the Public Service La*w for a new 115 kv transmission line from Auburn to Elbridge over a distance of 14.5 miles.

July 24, 2013
NYSEG holds a public information meeting on the proposed Auburn Transmission Project. (13-T-0235)

July 29, 2013
PSC holds repowering hearing in Case 12-E-0577.

Overview of Reliability

Bulk electric system reliability consists of two primary elements:

- Resource Adequacy – are there enough system resources, deliverable when and where needed, to meet demand (load); and
- Transmission Operating Reliability – is the delivery system adequate to get the power to the demand (load) and can it withstand various contingencies without dire consequences.

Resource adequacy is determined on a probabilistic basis. In the Northeast, the generally applied standard is "one day in ten years." This means that sufficient resources must be available to serve all firm customer demand such that the probability of involuntary disconnection of the firm load (demand) is no greater than one occurrence in ten years. Resource adequacy problems, or shortages in generating capacity and other resources, can lead to voltage reductions (brownouts), public appeals to reduce consumption and rotating feeder outages (disconnection of load).

Transmission operating reliability is assessed on a deterministic basis. Transmission standards specify a variety of specific potential disturbances or "contingencies" – the bulk electric system must be able to withstand any of these without adverse consequences. Failure of the transmission system can lead to overloads, cascading outages, instability and blackouts over widespread areas.

NYISO is the Planning Coordinator for the NYCA.

Distribution electrical system reliability is in many ways analogous to transmission system reliability.