**UNITED STATES OF AMERICA**
**FEDERAL ENERGY REGULATORY COMMISSION**

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| **Millennium Pipeline Company, L.P.** | **)** | **Docket Nos. CP98-150-000, et al.** |
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**COMMENTS OF NEW YORK STATE RELIABILITY COUNCIL ON PROPOSED MILLENNIUM PIPELINE PROJECT IMPACT ON MILLWOOD-SPRAIN BROOK RIGHT-OF-WAY**

## I. Introduction

The New York State Reliability Council ("NYSRC") hereby files comments on the potential impact of the Millennium Pipeline Company, L.P. ("Millennium") proposal on a Consolidated Edison Company of New York, Inc.'s ("Con Edison") right-of-way in Westchester County, New York. The NYSRC is a limited liability company which is entrusted with the responsibility to ensure that adequate reliability standards are maintained in the New York Control Area ("NYCA"). The Millennium proposal, if approved without substantial modification to the proposed route which has the gas pipeline in the same corridor as the Con Edison Millwood-Sprain Brook 345kV transmission lines and the same corridor as the Con Edison electric right-of-way between Buchanan and Millwood, will increase the probability of an extreme contingency and pose a potential threat to the reliability of the New York State transmission grid. The filing of these comments, however, should not be construed as opposition by the NYSRC to the Millennium gas pipeline in its entirety, or as opposition by the NYSRC to the construction of gas pipelines in the same corridor as an electric transmission right-of-way in appropriate circumstances.

## II. Reliability of the Bulk Power System in General

There are essentially two aspects to reliability considerations for the bulk power system:

1) the adequacy of the generating capacity available; and 2) the integrity of the high voltage transmission system. The former, having sufficient generating capacity, is analyzed on a probabilistic basis; that is, the sufficiency of adequate generating resources is amenable to statistical or probabilistic measure. Probabilistic standards are established, and calculated actual values of "loss of load probability" or "loss of load expectation" are compared to them. From this approach comes the well-known "one day in ten years" criteria, which is the standard in North America and most of the developed world. The latter, transmission system reliability, is analyzed on a deterministic rather than a probabilistic basis. Specific "contingencies" are chosen, and the system is tested to determine if it could survive them. Or, more likely today, transmission transfer capabilities are set by establishing the maximum value of power transfer for which the system could withstand the chosen contingencies without overloads, low voltages, or system interruptions. The application of probabilistic techniques to reliability analysis of the bulk power transmission system has been attempted for at least forty years, so far unsuccessfully. The problem from a mathematical point of view is several orders of magnitude more complex than for generation adequacy, with a number of additional dimensions. Consequently, bulk power transmission reliability is still the province of deterministic analysis.

## III. Transmission Reliability

Specific contingencies are chosen for "normal" conditions. The fundamental philosophy for their selection is that they reflect what is called the "worst single contingency." In other words, the system must survive the worst disturbance which could occur as a result of a single cause. Usually, this means loss of a single system element -- e.g., loss of a faulted transmission circuit, failure of a transformer, loss of a large generating unit. (This is sometimes referred to as the "n -1" criterion.)  In some cases, simultaneous loss of two system elements may be included if this could result from a reasonable common mode failure such as the collapse of a single transmission tower carrying two transmission circuits.  The severity of the electrical fault or short circuit is another consideration.  In general, the selection of the specific contingencies to be used in the criteria is the result of engineering experience and judgement, and some sense of the probabilities of various types of disturbances.  There is a great deal of consistency in the selection of appropriate contingencies among the ten regional reliability councils in North America.

## IV. Extreme Contingencies

There is one other category of transmission contingency which is normally included in transmission criteria -- those that go beyond the normal criteria in severity.  These are known by various terms; in the Northeast Power Coordinating Council ("NPCC"), they are called "Extreme Contingencies."  Section 7.0 of the "NPCC Basic Criteria for Design and Operation of Interconnected Power Systems" is devoted to Extreme Contingencies.  The NPCC Basic Criteria for Interconnected Power Systems is NPCC's basic standards document, and was developed in the aftermath of the November 9, 1965 Northeast Blackout.  It has been in existence in essentially the same form since January 1966.  Section 3.2.5 of the NYSRC Initial Reliability Rules contains similar provisions with respect to Extreme Contingencies.  Both Section 7.0 of the NPCC Basic Criteria for Design and Operation of Interconnected Power Systems and Section 3.2.5 of the NYSRC Initial Reliability Rules are set forth in the Appendix to this document.

The purpose of Extreme Contingencies is to recognize that disturbances sometimes happen which are more severe than the common mode failure events specified in the normal criteria.  While their probability is very low individually, they are chosen to represent the almost infinite number of unusual contingencies which could occur. They represent a test of system strength; a well-planned and well-operated system should be able to survive them without major loss of load or total system breakup under reasonable power transfer conditions. As the NPCC Basic Criteria specifies, "After due assessment of extreme contingencies, measures will be utilized where appropriate to reduce the frequency of occurrence of such contingencies, or to mitigate the consequences that are indicated as a result of testing for such contingencies."

The NPCC Basic Criteria does not require that the system be planned, designed and operated according to these Extreme Contingencies. But the Basic Criteria does expect that a philosophy of prudent avoidance should be followed.

## V. Millennium Proposal

The proposal to construct the Millennium Pipeline, a major interstate natural gas pipeline, along the existing Con Edison Millwood-Sprain Brook high voltage right-of-way would create a very real threat to the reliability of electric service to New York City in the event of a gas line explosion. This corridor happens to be the most important and most critical electric power interconnection between the major load center of New York City and the rest of the Eastern Interconnection. The corridor carries four and in some places six 345kV high voltage transmission lines, with a total thermal capability well in excess of 5,000MW. Substantial capacity resources being delivered to New York City and Long Island from upstate New York flow through the transmission lines in this corridor. Sudden loss of these circuits would raise the possibility of major problems for electric consumers in New York City -- including a possible system separation and even a total New York City blackout, especially under higher than average power transfer conditions.

In addition to the potential loss of four to six 345kV electric transmission lines that supply southeastern New York, such a contingency would also impact the availability of gas-fired electric generation in southeastern New York, by virtue of a simultaneous loss of a major new gas supply to several new larger generating plants that could result in the loss of 2000 MW or more of additional supply to New York City and the surrounding area.

Finally, since the proposed Millennium Pipeline would also utilize the same corridor as the Con Edison electric right-of-way between Buchanan and Millwood, it would impact the emergency outside electric supply to the Indian Point nuclear power plant. Indian Point's only connection to the bulk power grid is at the Buchanan 345kV substation. An explosion of the gas pipeline along the Buchanan-Millwood right-of-way could simultaneously remove a number of 345kV and 138kV circuits counted on as emergency backup for the nuclear units.

**Conclusion**

In light of the foregoing, it is the New York State Reliability Council's view that the construction of the Millennium Pipeline without substantial modification of the proposed route which has the gas pipeline in the same corridor as the Con Edison 345kV transmission lines south of Millwood and the same corridor as the Con Edison electric right-of-way between Buchanan and Millwood, would increase the likelihood of an occurrence of an extreme contingency. We recognize that a gas explosion is an event which has a very low probability. However, the potential consequences of such an event could be catastrophic. In our view, the health and safety of the citizens of New York would be unacceptably jeopardized. Further, we believe our views are fully supported by and consistent with Section 7.0 of the "NPCC Basic Criteria for Interconnected Power Systems," and Section 3.2.5 of the NYSRC Initial Reliability Rules, which indicate that measures will be utilized to reduce the frequency of occurrence or mitigate the consequences of extreme contingencies. The construction of the Millennium gas pipeline along the Con Edison corridors is likely to increase both the possibility of occurrence and the consequences of an extreme contingency, and the currently proposed route, therefore, is unacceptable. As noted above, however, these comments should not be construed as opposition by the NYSRC to the Millennium gas pipeline in its entirety or as opposition by the NYSRC to the construction of gas pipelines in the same corridor as an electric utility right-of-way in appropriate circumstances.

Respectfully Submitted,

**NEW YORK STATE RELIABILITY COUNCIL**

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# APPENDIX

## NPCC Document A-2

## Basic Criteria for Design and Operation of Interconnected Power Systems

**August 9, 1995**

### 7.0 Extreme Contingency Assessment

Extreme contingency assessment recognizes that the bulk power system can be subjected to events which exceed, in severity, the contingencies listed in Section 5.1. One of the objectives of extreme contingency assessment is to determine, through planning studies, the effects of extreme contingencies on system performance. This is done in order to obtain an indication of system strength, or to determine the extent of a widespread system disturbance, even though extreme contingencies do have low probabilities of occurrence. The specified extreme contingencies listed below are intended to serve as a means of identifying some of those particular situations that could result in widespread bulk power system shutdown. Assessment of the extreme contingencies listed below should examine post contingency steady state conditions, as well as stability, overload cascading and voltage collapse. Pre-contingency load flows chosen for analysis should reflect reasonable power transfer conditions within Areas, or from Area to Area. Analytical studies will be conducted to determine the effect of the following extreme contingencies:

a. Loss of the entire capability of a generating station.

b. Loss of all lines emanating from a generating station, switching station or substation.

c. Loss of all transmission circuits on a common right-of-way.

e. The sudden dropping of a large load or major load center.

f. The effect of severe power swings arising from disturbances outside the Council's interconnected systems.

g. Failure of a special protection system, to operate when required following the normal contingencies listed in Section 5.1.

h. The operation or partial operation of a special protection system for an event or condition for which it was not intended to operate.

After due assessment of extreme contingencies, measures will be utilized where appropriate to reduce the frequency of occurrence of such contingencies, or to mitigate the consequences that are indicated as a result of testing for such contingencies.

**NYSRC Initial Reliability Rules**

**Section 3.2.5 Extreme Contingency Assessment**

**September 10, 1999**

## 3.2.5 Extreme Contingency Assessment

Extreme contingency assessment recognizes that the BPS[1] can be subjected to events which exceed in severity the contingencies listed in Section 2.2. One of the objectives of extreme contingency assessment is to determine, through planning studies, the effects of extreme contingencies on system performance. This is done in order to obtain an indication of system strength or to determine the extent of a widespread system disturbance, even though extreme contingencies do have low probabilities of occurrence. The specified extreme contingencies listed below are intended to serve as a means of identifying some of those particular situations that could result in a widespread BPS shutdown.

Assessment of the extreme contingencies listed below should examine post-contingency steady state conditions as well as stability, overload cascading and voltage collapse. Pre-continency load flows chosen for analysis should reflect reasonable power transfer conditions. The testing should be conducted at megawatt transfers at the expected average transfer level. This may be at or near the Normal transfer limit for some interfaces.

Analytical studies shall be performed to determine the effect of the following extreme contingencies:

a. Loss of the entire capability of a generating station.

b. Loss of all lines emanating from a generating station, switching station or substation.

c. Loss of all transmission circuits on a common right-of-way.

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[1] Bulk Power System.

d. Permanent three phase fault on any generator, transmission circuit, transformer, or bus section, which delayed fault clearing and with due regard to reclosing.

e. The sudden loss of a large load or major load center.

f. The effect of severe power swings arising from disturbances outside the New York BPS.

g. Failure of an SPS[2] to operate when required following the normal contingencies listed in Section 2.2.

h. The Operation or partial operation of an SPS for an event or condition for which it was not intended to operate.

After due assessment of extreme contingencies, measures will be utilized where appropriate, to reduce the frequency of occurrence of such contingencies, or to mitigate the consequences that are indicated as a result of testing for such contingencies.

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2 Special Protection System.

## CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person who is designated on the official service list compiled by the Secretary in this proceeding in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure.

Dated at Washington, D.C. this 6th day of March, 2000.

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Joseph H. Fagan

Counsel to the New York State
Reliability Council