STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

At a session of the Public Service Commission held in the City of Albany on June 26, 1991

COMMISSIONERS PRESENT:

Peter Bradford, Chairman
Harold A. Jerry, Jr.
Gail Garfield Schwartz
Henry G. Williams

CASE 90-E-1119 - Proceeding on motion of the Commission to consider establishing standards on Reliability and Quality of Electric Service

ORDER ADOPTING STANDARDS ON RELIABILITY AND QUALITY OF ELECTRIC SERVICE

(Issued and Effective July 2, 1991)

In response to a 1989 Department of Public Service policy initiative to establish service standards for electric, telephone, gas, and water service, staff of the Power Division began drafting standards for the reliability and quality of electric service. This initiative went forward as part of the Department-wide Quality Assurance Task Force on standards. By the fall of 1990 the draft was ready for comment by interested parties.

By order issued December 18, 1990, a proceeding was initiated for that purpose. Comments on staff's proposal were sought from consumer groups, other state agencies, the electric utilities, and other interested parties. The proposal requires each Class A electric utility to develop programs that detail specific actions it will take to ensure that adequate service is provided. The requirements involve the establishment of minimum acceptable (Minimum) and desirable (Objective) levels of reliability. Reliability is gauged by nationally accepted indices for both the frequency and duration of service interruptions. The recommended reliability levels were customized for each of the utility's operating areas in the State.

The proposal also includes criteria for identifying, ranking, and developing appropriate improvement plans for the worst-performing circuits in each operating area. In addition the utilities are required to develop programs for responding to customers' power quality problems.

Comments were received from the New York City Department of Telecommunications and Energy and the seven major electric companies serving New York State. The respondents generally favor the proposal, but there were disagreements on several issues. Staff has evaluated all of the comments, proposed modifications to the standards on several issues, as discussed in the attached memorandum dated June 17, 1991, and recommended that the modified standards shown in Appendix 1 of staff's June 17, 1991, memorandum be adopted.

We agree with Staff that the standards for electric reliability and power quality, as now modified, are appropriate and in final form ready for adoption. Adoption of these standards now, which we do, will provide the affected Class A utilities ample notice and time to meet the first program filing requirements on December 31, 1991. We note that the Pennsylvania Electric Company is a Class A electric company but because of the small size of its service territory and small number of customers served in this State, we shall exempt it from these standards.

The Commission Orders:

1. The service reliability and quality standards applicable to Class A electric corporations (except the Pennsylvania Electric Company) shown in Appendix 1 to staff's memorandum of June 17, 1991 (which is made a part hereof), are adopted and are effective immediately.

2. The first annual program filing date to meet the requirements of Sections 3 and 4 of the foregoing standards shall be December 31, 1991.

3. The first annual report of operating area and individual circuit performance required by Section 7 of the foregoing standards shall be submitted by June 30, 1992, based on 1991 interruption and operating data.

4. This proceeding is continued.

By the Commission,

(SIGNED) JOHN J. KELLIHER
Secretary

STATE OF NEW YORK
DEPARTMENT OF PUBLIC SERVICE

June 17, 1991

TO: THE COMMISSION

FROM: POWER DIVISION - SYSTEM OPERATIONS SECTION

SUBJECT: CASE 90-E-1119 - Proceeding on motion of the Commission to consider establishing standards on Reliability and Quality of Electric Service

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RECOMMENDATION: That the Commission formally adopt staff's proposed standards on Reliability and Quality of Electric Service, modified as discussed herein

SUMMARY

By order dated December 18, 1990, the Commission issued for comment a proposal to establish standards for the reliability and quality of electric service in New York State. The proposal would require each Class A electric utility to develop programs that detail specific actions it will take to ensure that adequate service is provided. The requirements involve the establishment of minimum acceptable (Minimum) and desirable (Objective) levels of reliability. Reliability is gauged by nationally accepted indices for both the frequency and duration of service interruptions. The recommended reliability levels were customized for each of the utility's operating areas in New York State.

The proposal also included criteria for identifying, ranking and developing appropriate improvement plans for the worst-performing circuits in each operating area. In addition, the utilities are required to develop programs for responding to customers' power quality problems.

Comments were received from the New York City Department of Telecommunications and Energy and the seven major electric

companies serving New York State. The respondents generally favor the proposal, but there were disagreements on several minor issues. Staff evaluated all of the comments and is proposing modifications to the proposal on several issues including the following changes:

(1) The criteria for determining when an operating area's performance is unacceptable were changed so that a full year of operating below minimum criteria is now required instead of two successive calendar quarters. An analysis of the cause(s) of unacceptable performance and report on possible remedial actions is now required at the end of the calendar year instead of at the end of two quarters below the minimum acceptable limit.

(2) The requirements for worst-performing circuits have been changed so that the top 2-1/2 percent of each circuit's individual comparative rankings is used to select worst-performing circuits to aggregate 5 percent of all circuits, rather than adding rankings together. This is discussed in detail below. The utilities may select worst-performing circuits using alternative criteria, but must justify those choices.

(3) The date for filing reliability and power quality programs has been changed from June 1, 1991, to December 30, 1991. The date for filing compliance reports on operating area and circuit performance has been changed from June 1, 1992, to June 30, 1992.

Comments of a clarifying or editorial nature were also received and many suggestions were incorporated into the text. We recommend that the Commission adopt the revised standards in Appendix 1.

We would emphasize that the recommended standards will be reviewed annually by staff. We would expect that service improvement will be reflected in higher minimum acceptable and goal limits over time.

BACKGROUND

In response to a 1989 Department policy initiative to establish service standards for electric, telephone, gas and water service, the Power Division began drafting standards for the reliability and quality of electric service. This initiative went forward as part of the Department task force on standards. By the

fall of 1990, the draft was ready for comment by outside interested parties.

By order issued December 18, 1990, the Commission initiated a proceeding to consider electric reliability and quality standards. It issued staff's proposal for review and comment to consumer groups, other state agencies, the electric utilities and other interested parties.

Staff's analysis and recommendations for the disposition of the comments received are presented in this memorandum.

OVERVIEW OF COMMENTS

Comments were submitted by the New York City Department of Telecommunications and Energy (NYCDT&E), Central Hudson Gas & Electric Corporation (CHG&E), Consolidated Edison Company of New York (Con Ed), Long Island Lighting Company (LILCO), New York State Electric and Gas Corporation (NYSEG), Niagara Mohawk Power Corporation (NMPC), Orange and Rockland Utilities, Inc. (O&R) and Rochester Gas & Electric Corporation (RG&E). The Fishers Island Electric Corporation also wrote, but only to request exemption from the proposed standards. The proposed standards apply to Class A utilities only; and because Fisher's Island is not a Class A electric company, it would not be subject to the proposed requirements.[1/]

Some of the utilities' general comments addressed the text of staff's November 28, 1990, explanatory memorandum to the Commission; other comments addressed the proposed standards. The respondents generally agreed that the proposed standards are a suitable means for ensuring that reasonable reliability and quality of electric service are being delivered in each electric operating area within New York State. Specifically, there was agreement that the standards should: (1) recognize the various differences among

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[1/] The Pennsylvania Electric Company, which is a Class A electric company, should be exempted from these requirements because the size of its service territory and number of customers served in New York State are very small.

utility franchise and operating areas, (2) establish both a threshold Minimum Level and a desirable Objective Level of acceptable electric service, (3) use accepted industry indices to measure reliability performance, (4) make provisions for identifying and improving the performance of worst-performing circuits and operating areas that do not meet minimum performance levels, and (5) require annual reports to the Public Service Commission.

Some utilities asserted that without raising costs, it will not be possible to sustain existing system reliability levels while improving service in poor performing areas. Utilities claim that reallocation of resources among operating areas is the only practicable approach. They claim that financial limitations will mean compromising the levels of the better-performing areas in order to bring the poorer-performing areas up to standard. As a result, they state, system reliability averages may not improve as staff's proposal foresees unless rate or other relief is granted to accommodate extra costs, or special rate classes are created.

We believe that the utilities should be able to allocate resources in such a manner that high priority reliability needs are dealt with in a timely way without special funding arrangements. If, however, additional costs are incurred, the justification for those costs can be examined in rate cases, on a case-by-case basis.

While there was general acceptance of the use of utility operating areas as the basis for service standards, O&R noted that greater variations occur in the frequency and duration indices for its three relatively small operating areas than in larger operating areas of other utilities. Its operating areas range in customer size from about 42,000 in the Western Division to about 98,000 in O&R's Eastern Division. Over the past five years, O&R says interruption frequency on a system-wide basis varied within a 30 percent bandwidth around the Objective Level, but on a divisional basis the bandwidth variation was closer to 97 percent.

This sort of statistical variation is not confined to O&R. It would apply to several small operating areas in the NYSEG, NMPC, CHG&E, and RG&E franchise territories. While we recognize the

potential for greater statistical variation in the small areas, we do not believe it is sufficient to warrant special treatment in the standards. Staff and the utilities may have to exercise greater care in evaluating the statistics in these smaller areas.

SELECTION OF RELIABILITY INDICES

Sections 1.(e), 5.(a), (b) and (c) and 6.(a) and (b)

The Proposal

Staff's proposed standards used the System Average Interruption Frequency Index (SAIFI)[2/] and the Customer Average Interruption Duration Index (CAIDI)[3/] as the indices for (1) measuring frequency and duration of service interruptions in each operating area of each major New York State electric utility, and (2) in identifying the worst-performing circuits in each operating area. The proposal excluded interruptions caused by major storms from the calculations.[4/]

For operating areas, unacceptable performance was defined to occur when either the SAIFI or the CAIDI index of an operating area fell below the Minimum Level values established in the standards. A report to staff was required when performance fell below the Minimum Level for two successive calendar quarters, based on a 12-month average.

To determine worst-performing circuits, the SAIFI and CAIDI indices were to be calculated for each circuit in each operating area at the end of the calendar year. Then each circuit was to be placed in rank order, according to its respective SAIFI and CAIDI

[2/] The number of times the average customer's service is interrupted in a year.

[3/] The average number of hours required to restore service to a customer whose service is interrupted.

[4/] Interruptions caused by major storms are largely outside a utility's control and are not indicative of the reasonableness or effectiveness of the maintenance of the distribution system.

index, with the highest number at the top of the list. Thereafter, the SAIFI and CAIDI ranking numbers of each circuit were to be added together and from the result, the 5 percent with the highest scores or three circuits, whichever were more, were to be selected as worst-performing circuits.

(1) Operating Area Indices Comments

A majority of the respondents endorsed the use of SAIFI and CAIDI to measure operating area frequency and duration performance. The NYCDT&E asserted that SAIFI is the best index to measure reliability. However, CHG&E and NYSEG suggested adding the System Average Interruption Duration Index (SAIDI)[5/] to the choice of indices to either supplement or replace SAIFI and CAIDI. NYSEG believes that SAIDI more effectively measures the cumulative effect on customers of frequent and lengthy outages. CHG&E points out that SAIDI is mathematically equal to SAIFI times CAIDI.

Discussion

Independent and utility-sponsored surveys show that customers are first concerned about the frequency of electric service interruptions, i.e., how many and how often they occur. Duration is their secondary concern, i.e., how long interruptions last before service is restored. We are satisfied that the SAIFI and CAIDI measures reflect the most important aspects of interruptions, i.e., the number (frequency) and length (duration). Applying them together, as CHG&E suggests with SAIDI, provides no additional information, and indeed masks the understanding as to how interruption frequency and interruption duration contribute to total customer time out of service. We therefore recommend no change to staff's proposal.

[5/] SAIDI is the average amount of time a customer is out of service during the year.

(2) Worst-Performing Circuit Indices Comments

Four of the utilities had problems with the method proposed for determining the worst-performing circuits in each operating area, as well as the reporting requirements. O&R noted that each year the rearrangement of its circuits (up to 32 percent in some areas) made the customer-served statistics vary so much that a frequency ratio based on them may not be valid.

CHG&E wants to use SAIDI in lieu of the sum of the SAIFI and CAIDI rankings, which the company says have no meaning. CHG&E also objects to characterizing circuits as "worst-performing" but offers no alternative term. NYSEG also suggests that SAIDI is more representative of conditions than either SAIFI or CAIDI and wants to insert it ahead of SAIFI and CAIDI during circuit ranking. Another NYSEG point is that there should be a history of at least three years sub-minimum performance before a circuit is declared worst-performing.

RG&E asserts that staff's proposed method of combining the indices is flawed and suggests taking the top 2-1/2 percent of both the SAIFI and CAIDI rankings individually to identify the worst-performing circuits. RG&E also suggests adding a minimum of two interruptions per year as part of the exclusion requirement for worst-performing circuit eligibility.

Discussion

We agree that staff's proposed method for identifying worst-performing circuits has weaknesses, but we have not found a selection method without flaws. We do recommend a change in the proposed methodology along the lines suggested by RG&E. After the circuits in an operating area are ranked by their SAIFI and CAIDI indices, the 2-1/2 percent with the highest individual SAIFI and CAIDI scores on each list should be chosen as the worst-performing circuits in an operating area.[6/] Exceptions would be made for

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[6/] In the event a circuit appears on both lists, the next worst circuit under SAIFI and CAIDI would also be included so the total number of circuits reviewed is still 5 percent.

(1) circuits having fewer than two interruptions per year, (2) those serving less than 100 customers, and (3) those which meet the SAIFI and CAIDI Minimum Level value for their respective operating area.

Because it is not clear which ranking procedure will work best, we propose that those utilities that prefer alternative criteria for identifying worst-performing circuits be allowed to use them. The resulting list of worst-performing circuits should be analyzed in accordance with the requirements of Section 7. The utilities shall also submit a list of the circuit rankings under staff's method described above. Staff will analyze rankings from the different methods to determine if a preferred approach exists.

As for CHG&E's labeling concern, the phrase "worst-performing" conveys our intent of highlighting troublesome circuits in clear language.

The statistical tracking problem associated with circuit switching and reconfiguration cited by O&R is an acknowledged problem. However, we are satisfied that O&R, along with the other companies, can exercise judgment and surmount the technical obstacles involved in order to recreate and assess circuit layouts from previous years as needed. We do not accept NYSEG's contention that three years of poor performance are needed before any action is taken.

(3) Data Exclusion Comments

CHG&E agrees with the exclusion of major storms from the interruption data, but argues that the 16NYCRR Part 97, Section 97.1 Definition should be interpreted so that both conditions of 10 percent of customers in an operating area and the 24-hour criteria apply. RG&E offers a revised definition which says that a major storm is a period of adverse weather during which service interruptions affect either 10 percent of customers in an operating area out of service for at least two hours, or more than 2 percent of customers out of service for 24 hours or more.

NYSEG, NMPC and O&R all want to expand the exclusion beyond major storms to include such conditions as pre-arranged interruptions, periods of emergency, catastrophes, natural

disaster, load shedding, voltage excursions from voltage reductions, as well as extraordinary or abnormal conditions of operating or other events beyond a utility's direct control.

Discussion

There is apparently some confusion over how to interpret the conjunctive "and/or" in the Part 97 Definition of a Major Storm. We propose no rule change. However, it should be understood that the criteria for a major storm will be met when at least 10 percent of customers in an operating area are without electric service or customers are without electric service for durations of 24 hours or more.

We believe that major storms and catastrophic events that clearly create conditions beyond a utility's direct control provide the only appropriate basis for exclusions from the standard. We therefore recommend rejection of other singular proposals. We recommend that justification for exclusion of catastrophic events other than major storms be submitted by the affected utility with its filing of interruption data.

MINIMUM AND OBJECTIVE LEVEL DEFINITIONS AND REQUIREMENTS
Section 5.(a), (b) and (c)

The Proposal

The proposal stated that each company shall take measures necessary for each of its operating areas to meet a Minimum "threshold" level of adequate service and to strive to attain a better Objective Level which represents a fully adequate level of service. Each of the levels were defined using SAIFI and CAIDI indices in the criteria. Analytic reports were to be prepared and filed annually for those operating areas that fell below the Minimum Level for two successive quarters.

Comments

The overall concept of Minimum and Objective Levels of service was generally accepted, with minor exceptions. CHG&E and NYSEG each propose modifications revolving around the phrase

"adequate level." NYSEG also suggests addition of the phrase "below which further review, analysis and correction may be required," to the definition of Minimum Level. NYSEG further suggests adding a caveat to the Minimum Level definition stating that a utility's failure to attain the Minimum Level is not indicative of unacceptable service.

CHG&E, O&R and RG&E all had problems with the criteria used to define below-minimum level performance and the proposed response requirements for operating areas that failed to meet Minimum Level requirements. CHG&E argues that a violation should not occur until a level or value representing the sum of SAIFI and CAIDI of an operating area is exceeded for two successive quarters.

CHG&E, NYSEG, O&R and RG&E believe that 12 months is too short a time period upon which to base a rolling average when calculating operating area SAIFI and CAIDI indices. NYSEG suggests a 36-month base instead. CHG&E and RG&E each argue for preparation of any needed analytic and remedial action reports at the end of the calendar year instead of at the end of every period in which an operating area fails to meet the Minimum Level for two successive quarters.

Discussion

We believe that "fully adequate" is a stronger phrase than "good" when applied to service and have retained the former in Section 5.

We accept NYSEG's suggestion for incorporating the phrase "below which further review, analysis and corrective action may be required," in Section 5.(b), because it is consistent with our intent and with the definition of "Weakspot" level used in existing telephone standards. We cannot, however, recommend acceptance of NYSEG's proposal to add, "a utility's failure to attain Minimum Level service is not indicative of unacceptable service," to the Minimum Level definition. It contradicts the definition of unacceptable service found in Section 5.(c)(1).

We agree that the Section 5.(c)(1) and (2) quarterly requirements for operating areas with unacceptable performance have

some conceptual problems and could be onerous for the utilities. While the electric utilities should monitor operating area performance informally on a quarterly basis, we have shifted the requirement from quarterly assessments to an annual assessment at the end of the calendar year. The assessment would now use a simple 12-month average instead of the rolling average previously proposed.

We recommend not accepting CHG&E's argument that an "unacceptable" violation should not occur until a level representing the sum of the SAIFI and CAIDI indices of an operating area is exceeded for two successive quarters. The frequency of customer interruptions and the duration of those interruptions are separate problems, generally with different causes and different solutions. Thus, the use of SAIFI and CAIDI indices separately enables analysts to pinpoint more precisely the nature and cause of problems, whereas under SAIDI, these distinctions are lost.

SERVICE LEVEL VALUE ESTABLISHMENT - Section B

The Proposal

This Section contained provisions for staff to recommend to the Commission, from time to time, the actual numerical values for the SAIFI and CAIDI Objective and Minimum levels to be assigned to each operating area of each electric utility. Staff's initial method for setting the SAIFI and CAIDI values at Minimum and Objective Levels was to take the average of the best three out of five years to establish the Objective Level and the average of the worst three out of five years of the historical SAIFI and CAIDI indices to establish the Minimum Level. Staff adjusted the numbers after consideration of factors such as trends among indices, the average, high and low values of multi-year indices, demographic, geographic and load characteristics of an operating area, and the relative performance of an operating area in relation to other operating areas within a given utility's franchise area.

Comments

All of the respondents except LILCO expressed one type of concern or another over the method and criteria used to establish the values for the Objective and Minimum Levels of performance for the SAIFI and CAIDI indices. CHG&E, Con Ed, NMPC and the NYCDT&E argue that the Objective and Minimum Level values for SAIFI and CAIDI indices shown for operating areas in the proposal are too stringent. They believe that many operating areas will not be able to meet the Minimum Level values proposed by staff. They assert that factors other than those stated in the text must have been used in determining the proposed values.

Con Ed offers a substitute method for selecting the Minimum and Objective Level values for SAIFI and CAIDI. Con Ed's alternative method eliminates the best and worst years from five years of historical interruption data when selecting the SAIFI Objective Level. It then takes the average of the three remaining years to establish the Objective Level value and carries the calculation out to three decimal places. For calculating Minimum Levels of SAIFI and CAIDI, Con Ed asserts that it is more realistic to use the lowest level of the five years of interruption data considered. Con Ed says these are more representative of the range of high performance within which Con Ed's system operates.

Discussion

The methodology used by staff in calculating the values issued with the Draft Standards did involve judgments for selected operating areas. Generally, those adjustments applied to operating areas with performance indices well above average values.

In response to the comments, and in consultation with the companies, we have made minor adjustments to Minimum and Objective Level values for SAIFI and CAIDI involving NYSEG, NMPC, and O&R. We have made these adjustments while continuing to require improvement in performance for the worst-performing areas.

We agree that the narrow range of tolerances that emerges when calculating the Minimum and Objective Level values for SAIFI indices for Con Ed's networks is inappropriate for this high

performance system. To solve this problem, we have followed Con Ed's suggestions and used the lowest level of five years for the Minimum Level, discarded the high and low years for the Objective Level, and averaged the three remaining years. However, we find that our proposed method for calculating Con Ed's network and radial circuits CAIDI indices, and radial SAIFI indices remains appropriate.

POWER QUALITY PROGRAM REQUIREMENTS - Section 4

The Proposal

Under the proposal, each utility was required to consider power quality in the design of its distribution power-delivery system components and to file a power quality program with the Department that included its procedures, specifications and goals for performance. The programs were to be designed to respond promptly to customer reports of power quality problems and to avoid, mitigate, or resolve such problems to the extent practical. No numerical performance indices were established.

Comments

A majority of the respondents accepted the above requisites regarding power quality. However, CHG&E and NYSEG suggested that it is premature to consider power quality in general, and in specifications and goal performance of programs in particular. CHG&E suggested deferral of power quality requirements to a Phase II of the proceeding. NYSEG suggested limiting the scope of the present power quality handling to (a) procedures for responding to, investigating and reporting customer complaints relative to power quality, and (b) further research efforts to (1) develop a better understanding of power quality, (2) identify measures to improve power quality, and (3) develop a correlation between customer loads and power quality.

NYSEG also suggested a revision to the Section 1 General Provisions policy statement regarding power quality. It would involve inserting the clause "and certain aspects of" ahead of power quality. NYSEG also fears that the requirement of

Section 1.(d) "to provide adequate resources" in the second sentence, could be interpreted to mean that funds should be provided to improve service quality without cost-benefit justification.

O&R suggested that the filing of a separate program for power quality may not be necessary since the company has already included a Customer Service goal as part of its Revenue Decoupling Mechanism (RDM). Lastly, the NYCDT&E expressed concern that too little attention was being paid to the issue of power quality, which it described as so important in the financial-business districts of New York City. NYCDT&E also decried the lack of a method to quantify power quality and suggested a close working relationship between Department of Public Service staff and the utilities to develop such a methodology.

Discussion

The draft standard's requirements regarding power quality programs already recognize the inherent limitations of the subject area. The limitations include lack of a fully accepted definition, lack of a data base, the costs and limits of technical devices presently available for diagnostic and analytic work, as well as solutions to power quality problems. We do agree with NYSEG's suggestion that "performance objectives" should be substituted for the terms "specifications and goals" in Section 4.(b).

We believe that the caveats already contained in Section 4.(a) to the effect that each utility should "mitigate or avoid to the extent feasible, power quality disturbances under its control" and Section 4.(b) "to resolve problems to the extent practical" adequately convey our intended scope limitations and cost-benefit concerns. However, we have added that specific term to both Section 4.(a) and (b) for the sake of clarity.

The Section 4. requirement regarding power quality is reasonable and, therefore, we recommend not accepting O&R's suggestion that its RDM filing elsewhere will suffice for this requirement. To the extent that O&R's customer service goals include power quality, it should find it easier to fulfill those

requirements. The concept of power quality and what it embraces is still emerging. We understand the concern of the NYCDT&E that power quality is not dealt with in depth, but find that realities of present data and technical devices preclude that. Through this initial effort we expect to highlight power quality issues and begin to work more closely with the utilities in developing power quality programs that are responsive to customer needs. Meanwhile, we must await the results of power quality research.

EFFECTIVE DATE OF STANDARDS - Section 1(a) and Section 7

The Proposal

Staff had originally intended June 1, 1991, as the deadline for submitting the program descriptions and June 1, 1992, as the deadline for submittal of the first compliance report based on interruption data from 1991. These points were not clear in the staff proposal.

Comments

Because of the tight time constraints involved, NYSEG and O&R requested a postponement to January 1, 1992, for the effective date of the standards. CHG&E, NYSEG and NMPC each suggest that June 1, 1991, is too early a date for filing the first annual report. They ask for a postponement that would allow a nine to ten-month lead time.

Discussion

The June 1, 1991, date is past, and we agree that more preparation time should be allowed. We therefore recommend December 31, 1991 as the due date for the standards in terms of submitting program descriptions. We also agree that more lead time is needed for analysis and report preparation. We recommend June 30 as the due date for future annual compliance reports, with the first one due June 30, 1992. The reports will be based on interruption data from 1991 which is already recorded as per 16 NYCRR Part 97. No additional preparation time for data collection is necessary.

MISCELLANEOUS COMMENTS

Managerial, Cost Allocation and Liability Concerns

CHG&E takes issue with the Section 1.(d) statement that the utilities are expected to provide adequate resources to meet the service levels established by the Commission. CHG&E feels that the subject of how many personnel, pieces of equipment or dollars are provided by a utility are a part of its managerial prerogatives and that the admonition should be limited to "developing reasonable programs." NYSEG fears that the requirements of Section 1.(d), "to provide adequate resources" in the second sentence, could be interpreted to mean that funds should be provided to improve service quality without cost-benefit justification. CHG&E objects to the second sentence in Section 1.(d) because it believes that Commission efforts to provide a degree of quantification in determining the adequacy of service could make the utilities liable for failure to meet the prescribed standards under the terms of the "gross negligence" standard regarding liability to customers and third parties as a result of interruption of service.

NYSEG has further difficulty with the second sentence of Section 1.(d) which states that reaching the Objective Levels of service that are established under the standards is not indicative of whether the utility has provided adequate service to a particular customer or group of customers. NYSEG's suggested revision would remove the modifying word "adequate" with respect to providing service.

Discussion

The Section 1.(d) requirement to provide adequate resources to support the service reliability programs required by the standards is straightforward. Programs without funding are of no value. The phrase "as a general practice" ahead of "provide adequate resources" should suffice to give utilities suitable management discretion.

Also, in terms of NYSEG's "adequate service" concern, the Section 1.(d) language tracks that found in the existing telephone standards. Removal of the word "adequate" in the second sentence

would render the sentence meaningless, and we therefore do not agree to its deletion.

While we agree with CHG&E that liability can be a valid concern, we believe the concern is without basis here. The language of Section 1.(d) limits the applicability of the service standards to operating areas and the poorer-performing circuits within them. As was stated in staff's November 28, 1990, cover memorandum to the Commission, it is not practicable to apply the standards to individual utility customers. These standards are not intended to directly address individual customer service levels. Moreover, Counsel's office advises that the standards apply to service performance and are not related to the utilities' standard of liability.

NYSEG's concern over cost-effectiveness is addressed in the language of Section 3.(a) where cost-effectiveness is identified as a criterion to meet in designing programs to improve reliability. Section 4.(1) and Section 4.(b) have been modified to include cost-effectiveness.

Definitional and Conditional Language Concerns

O&R suggests that the definition of a momentary interruption in Section 2.(c) should be expanded. The expansion would include a series of momentaries that can occur due to several breaker operations resulting from one initiating event.

Because momentaries are not classified as sustained interruptions as defined under 16 NYCRR Part 97 or the proposed standards, there is no need to modify the momentary definition presented in Section 2.(c).

The respondents generally accepted the proposed language covering service reliability objectives in Section 3.(a). However, CHG&E and NYSEG said they felt inhibited by the statement that interruptions shall not be reduced by unduly increasing the number of momentary interruptions. The two companies believe that the statement tends to preclude them from installing reclosers to limit the effects of interruptions for some customers on a given circuit.

We recognize that protective devices such as reclosers are used to limit the effects of interruptions on large numbers of customers, while sometimes causing one or more momentaries in the process. We believe that the judgment of the utilities on how to strike a reasonable balance in the trade-offs involved here is necessary and the proposed language should be left intact.

CONCLUSION

We have modified the November 28, 1990, proposed standards for reliability and power quality to include the changes recommended in the foregoing discussion. The standards are now in final form as shown in Appendix 1, and we recommend their formal adoption by the Commission. By adopting the standards now, the utilities will have ample notice and time to meet the first filing requirements by December 31, 1991.

Respectfully submitted,

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Reviewed by:

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APPROVED:

G. F. WALSH
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Attachment (Appendix 1)

Appendix 1
6-17-91

SERVICE RELIABILITY AND QUALITY STANDARDS APPLICABLE TO CLASS A ELECTRIC CORPORATIONS[1/]

(Statutory Authority: Public Service Law, Sections 65 [1] and 66 [1])

Section 1. General Provisions

(a) The standards set forth herein have been developed to provide consumers, the Public Service Commission (PSC) and the electric utilities with a uniform method of ensuring that the reliability and quality of electric service that is being delivered in an electric utility's operating area is reasonable.

(b) The standards described in subsequent sections adopt the definitions, requirements for data maintenance, retention of records, report filing and interruption information set forth in 16 NYCRR, Chapter II, Electric Utilities; Subchapter A, Service; Part 97, NOTICE OF INTERRUPTIONS OF SERVICE, hereafter referred to as Part 97.

(c) These standards establish the reliability of service on an annual basis under all operating conditions except: (1) Major Storms, as defined in Part 97,

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[1/] The Pennsylvania Electric Company qualifies as a Class A electric utility, but it is exempted from these standards.

Section 97.1, **Definitions**, and (2) major catastrophic events, such as plane crashes, that are beyond a utility's control. Justification for exclusion due to catastrophic events must be submitted with each company's interruption data.

(d) The utility shall, as a general practice, provide adequate resources to meet the service levels set forth herein. Reaching the Objective Levels of service that are established herein is not indicative of whether the utility has provided adequate service to a particular customer or group of customers.

Section 2. Definitions

For the purpose of this Section, the following definitions shall supplement those set forth in Part 97, Section 97.1, **Definitions**.

(a) **Reliability**

The degree to which electric service is supplied without interruption.

(b) **Power Quality**

In general, the characteristics of electric power received by the customer, with the exception of interruptions. Characteristics of electric power that

detract from its quality include momentary interruptions, waveform irregularities and voltage variations - either prolonged or transient. Power quality problems shall include, but not be limited to, disturbances such as momentaries; high or low voltage; voltage spikes and transients; flickers and voltage sags, surges and short-time overvoltages; and harmonics, noise and "dirty" waveforms.

(c) **Momentary Interruption**

Interruption of electric service with a duration shorter than the time necessary to be classified as an interruption, as defined in Part 97, Section 97.1, Definitions.

(d) **Operating Area**

A geographical sub-division of each electric utility’s franchise territory that functions under the direction of a company office as used for interruption reporting under Part 97. These areas may also be referred to as regions, divisions, or districts.

(e) **Service Reliability Measures**

The following performance indices for measuring frequency and duration have been developed by the Edison Electric Institute (EEI), the Institute of Electrical and Electronics Engineers (IEEE), the Canadian Electric Association (CEA), and the American Public Power Association (APPA). They are recognized as standard definitions for the electric utility industry and may be applied to entire distribution systems, operating areas, sub-operating areas or individual circuits. Interruptions attributed to PSC cause code (01), Major Storms, as defined in Part 97, shall be omitted from the calculation of these indices throughout this standard.

(1) **System Average Interruption Frequency Index (SAIFI)**

This index is the average number of times that a customer is interrupted during a year. It is determined by dividing the total annual number of customers interrupted by the average number of customers served during the year. A customer interrupted is considered to be one interruption to one customer. This is the same as one customer affected.

$$\text{SAIFI} = \frac{\text{total number of customer interruptions}}{\text{total number of customers served}}$$

or

$$\text{CA/CS} = \frac{\text{total number of customers affected}}{\text{total number of customers served}}$$

(2) **Customer Average Interruption Duration Index (CAIDI)**

This is the average interruption duration time for those customers that experience an interruption during the year. It approximates the average length of time required to complete service restoration. It is determined by dividing the annual sum of all customer interruption durations by the sum of customers experiencing an interruption over a one-year period.

$$\text{CAIDI} = \frac{\text{sum of customer interruption durations}}{\text{total number of customers interrupted}}$$

or

$$\text{CH/CA} = \frac{\text{sum of customers affected hours}}{\text{total number of customers affected}}$$

Section 3. Service Reliability Objectives

(a) Each utility shall establish procedures to meet the service levels established herein. The utilities shall file with the Department by December 31, 1991 detailed electric service reliability programs that include goals and procedures. The programs should be designed to improve reliability where it can be improved cost-effectively and to sustain that reliability over time. Special emphasis should be given to the worst-performing circuits in each operating area. As described in Section 4 below regarding power quality disturbances, interruptions shall not be reduced by unduly increasing the number of momentary interruptions. Service interruptions

shall be reported to Department staff in accordance with the requirements of Part 97.

(b) In the event that service must be interrupted for purposes of working on the lines or equipment, the utility's work scheduling procedures shall provide that an attempt be made to do the work at a time which will cause minimal inconvenience to customers and, where reasonable and practicable, to provide notice to customers in advance of the interruption. The utilities shall keep a record, available for staff inspection, of those instances in which the utility concludes that it is not reasonable or practicable to provide advance notice.

Section 4. Power Quality Objectives

(a) Each utility shall consider power quality in the design of its distribution power-delivery system components. It shall strive to avoid and to mitigate, to the extent feasible and cost-effective, power quality disturbances under its control that adversely affect customers' properly designed equipment.

(b) Each utility shall, as a minimum, file by December 31, 1991 a power quality program with the Department that includes its performance objectives and procedures.

The programs should be designed to respond promptly to customer reports of power quality problems and to avoid, mitigate, or resolve such problems to the extent cost-effective and practical.

Section 5. Operating Area Reliability Performance Levels

Each utility shall take the measures necessary to meet the service levels defined in (a) and (b) below. The SAIFI and CAIDI indices of each operating area shall be calculated at the end of each calendar year for the previous 12-month period. The number of customers served that is used in computing these indices shall be the same as reported under Part 97.

(a) **Objective Level**

This level shall represent the fully adequate level of electric service that each utility should strive to achieve and maintain. It shall be reached when both of the SAIFI and CAIDI indices of each operating area of each electric utility are equal to or better than the SAIFI and CAIDI values established as the Objective Level under Section 8.

(b) **Minimum Level**

This level shall represent the lower threshold of adequate service below which further review, analysis and corrective action may be required. It shall be reached when the SAIFI and CAIDI indices of each operating area of each electric utility are equal to or better than the Minimum SAIFI and CAIDI values set forth under Section 8.

(c) **Failure to Meet Minimum Level**

(1) Performance below the Minimum Level shall be considered unacceptable when either the SAIFI or the CAIDI index of an operating area falls below the Minimum Level SAIFI and CAIDI values established under Section 8 for the calendar year.

(2) When a utility's calculations under (c)(1) above show that an operating area has fallen below the Minimum Level for the calendar year, the utility shall prepare a report to be submitted to the Department which analyzes the interruption patterns and trends, as well as the operating and maintenance history of the affected operating area, describes the problems causing unacceptable performance, and the actions the

utility is taking to resolve them. The report shall contain target dates for completion of the corrective action. The utility may determine that actions on its part are unwarranted - in those cases, its report shall provide adequate justification for such a conclusion. This analysis shall be included in the annual report described in Section 7.

Section 6. Individual Circuit Reliability Performance Level

(a) Each utility shall, at the end of each calendar year, calculate the SAIFI and CAIDI indices for each circuit in each operating area. Each circuit in each operating area shall then be listed in order separately according to its SAIFI index and also according to its CAIDI index, beginning with the highest values for each index.

(b) At the end of each calendar year, the worst-performing distribution circuits in each operating area of each electric company shall be identified in a report of **Worst-Performing Circuits.** The top two and one-half percent of circuits on each of the two lists prepared

according to Section 6.(a) shall be the worst-performing circuits per operating area. Combined, the worst-performing circuits report shall include five percent of the circuits in each operating area, or three circuits, whichever is more.[2/] Circuits which meet SAIFI and CAIDI Minimum Levels for their respective operating areas, those serving less than 100 customers, and those having fewer than two interruptions per year shall be excluded from this requirement. Circuits excluded for any of these reasons shall be replaced by the next worse circuit, so the total does not change.

(c) The utilities that prefer alternative criteria to those described in (a) and (b) above for identifying worst-performing circuits may submit to the Department their alternative list of the five percent of their worst-performing circuits along with the methodology and justification for their choices. These circuits shall be analyzed under the requirements of Section 7.(b). Companies making such alternative choices must

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[2/] In the event a circuit appears on both lists, the next worst circuit under SAIFI or CAIDI would also be included, so that the total number of circuits reviewed is five percent.

also submit the results of the circuit rankings required by (a) and (b) above, but the latter circuits shall be exempt from the analysis required under Section 7.(b).

Section 7. Annual Report

Each utility shall file a report with the Department by June 30 of every year,[3/] that includes at least the following information:

(a) An overall assessment of the reliability performance, in each of the company's operating areas, in relation to the Objective and Minimum Levels for interruption frequency and duration, as set by the Commission. This section of the report shall also fulfill the requirements of Section 5.(c)(2), for those regions failing to meet the Minimum Level.

(b) An analysis of the worst-performing circuits per operating area for the calendar year. This section of the report shall describe the actions that the utility has taken or will take to remedy the conditions responsible for each

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[3/] June 30, 1992 shall be the filing date for the first report.

listed circuit's unacceptable performance so that it can improve to the Minimum Level or above. Target dates for corrective actions shall be included in the report. The utility may determine that actions on its part are unwarranted - in those cases, its report shall provide adequate justification for such a conclusion.

(c) A listing of plans and schedules for improvements, as indicated by the above assessments, and estimated cost of those improvements.

(d) A report on the accomplishment of the improvements proposed in prior reports for which completion has not been previously reported.

(e) A description of any new reliability or power quality programs and changes that are made to existing programs.

Section 8. Service Level Value Establishment

From time to time, the Department shall recommend to the Commission the actual numerical values for the SAIFI and CAIDI Objective and Minimum levels to be

assigned to each operating area of each electric utility. Among the factors selected to guide the establishment of the SAIFI and CAIDI values will be comparison of actual multi-year SAIFI and CAIDI indices, trends among the indices, the average, high and low values of multi-year indices, demographic, physiographic and load characteristics of an operating area and the relative performance of an operating area in relation to other operating areas within a given utility’s franchise area.

The initial Objective and Minimum Level values for SAIFI and CAIDI indices of operating areas are provided in Attachment 1. Attachment (1)

INITIAL OBJECTIVE AND MINIMUM LEVEL VALUES FOR OPERATING AREAS					
		INTERRUPTION DURATION		INTERRUPTION FREQUENCY	
		HOURS (CAIDI)		(SAIFI)	
COMPANY	OPERATING AREA	OBJECTIVE	MINIMUM	OBJECTIVE	MINIMUM
CHG&E	Catskill	1.50	2.00	0.77	1.08
	Kingston	1.50	1.84	1.30	1.49
	Poughkeepsie	1.75	2.45	0.89	1.17
	Beacon/Peekskill	1.42	1.89	1.25	1.60
	Newburgh	1.50	2.00	1.33	1.60
CON EDISON	Bronx	1.10	1.30	0.38	0.62
	Staten Island	1.05	1.77	0.31	0.48
	Brooklyn	1.18	1.52	0.35	0.55
	Queens	1.45	1.62	0.29	0.34
	Westchester	1.44	1.54	0.40	0.47
	Queens/Nassau	0.93	1.12	0.93	1.23
LILCO	Central	1.11	1.35	1.09	1.40

INITIAL OBJECTIVE AND MINIMUM LEVEL VALUES FOR OPERATING AREAS					
		INTERRUPTION DURATION		INTERRUPTION FREQUENCY	
		HOURS (CAIDI)		(SAIFI)	
COMPANY	OPERATING AREA	OBJECTIVE	MINIMUM	OBJECTIVE	MINIMUM
	West Suffolk	1.09	1.21	1.30	1.60
	East Suffolk	0.89	1.19	1.75	2.10
NMPC	Central	1.59	1.97	0.87	1.08
	Mohawk Valley	2.00	2.40	0.99	1.33
	Northern	1.90	2.10	0.84	1.22
	Capital	1.75	2.10	0.48	0.60
	Northeast	2.50	3.00	1.15	1.41
	Frontier	1.30	1.52	0.41	0.51
	Genesee	1.70	2.09	0.90	1.17
	Southwest	1.46	1.70	0.62	0.84

INITIAL OBJECTIVE AND MINIMUM LEVEL VALUES FOR OPERATING AREAS					
		INTERRUPTION DURATION		INTERRUPTION FREQUENCY	
		HOURS (CAIDI)		(SAIFI)	
COMPANY	OPERATING AREA	OBJECTIVE	MINIMUM	OBJECTIVE	MINIMUM
NYSEG	Auburn	1.26	1.73	1.17	1.40
	Berkshire	1.50	1.70	1.01	1.29
	Binghamton	1.75	2.00	0.68	1.20
	Brewster	1.75	2.50	1.15	1.41
	Elmira	1.75	2.40	0.63	1.03
	Geneva	1.50	1.85	1.30	1.48
	Hornell	1.60	1.97	0.65	0.91
	Ithaca	1.75	2.40	0.73	0.96
	Lancaster	1.50	1.72	1.03	1.39
	Liberty	2.00	2.50	1.30	1.75
	Lockport	1.31	1.65	0.41	0.70
	Oneonta	1.80	2.50	1.02	1.28
	Plattsburgh	1.01	1.30	2.50	2.75
O&R	Eastern	1.07	1.46	1.75	2.00

INITIAL OBJECTIVE AND MINIMUM LEVEL VALUES FOR OPERATING AREAS					
		INTERRUPTION DURATION		INTERRUPTION FREQUENCY	
		HOURS (CAIDI)		(SAIFI)	
COMPANY	OPERATING AREA	OBJECTIVE	MINIMUM	OBJECTIVE	MINIMUM
	Central	1.35	1.70	2.00	2.50
	Western	1.27	1.53	2.00	2.25
RG&E	Rochester	1.60	1.80	0.72	1.01
	Cand. Finger Lakes	1.11	1.43	1.70	2.20
	Lakeshore	1.13	1.47	1.50	2.20
	Genesee Pavillion	1.21	1.41	1.25	1.60
CON EDISON	Manhattan	2.75	3.75	0.007	0.015
NETWORK	Bronx	2.40	2.75	0.006	0.008
	Brooklyn	2.40	2.75	0.012	0.014
	Queens	2.50	3.00	0.003	0.006
	Westchester	1.70	2.75	0.004	0.020