

AUG 11 1971

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

At a session of the Public Service
Commission held in the City of
Albany August 3, 1971.

COMMISSIONERS PRESENT:

Joseph C. Swidler, Chairman
Edward P. Larkin
John T. Ryan
William K. Jones, concurring in part and dissenting in part.

CASE 25937 - Proceeding on motion of the Commission as to
the plans and procedures of electric corporations for load
shedding in times of emergency.
SECOND INTERIM REPORT.

Opinion and Order Fixing Procedures
for Load Adjustment by Consolidated
Edison Company of New York, Inc.,
in Times of Emergency

(Issued August 9, 1971)

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BY THE COMMISSION:

This is the third order issued in this proceeding, begun on the Commission's own motion, to investigate the plans of electric companies for load reduction in times of emergency. It supersedes an Interim Order issued June 23, 1971, dealing with the load shedding procedures of Consolidated Edison Company of New York, Inc. ("Consolidated Edison" or "the Company").^{1/}

In this statewide proceeding, public hearings were held before Commissioner William K. Jones on March 16, 17 and 18 (New York City), April 21 (Albany) and May 6, 1971 (New York City). The seven major investor-owned companies in the State, the New York Power Pool, the City of New York and the Commission's staff introduced evidence, and the Power Authority of the State of New York and various organizations and individuals submitted statements.

Recognizing the urgency of the problems arising from the threatened shortage of electric power in the New York City area, Commissioner Jones issued a Second Interim Report ("the Report"), confined to that one subject, without awaiting the conclusion of hearings on related topics. The Report was served on all parties to the

^{1/}The order of June 23, 1971 was the second order in these proceedings. The first interim order, issued June 3, 1971 and based upon a First Interim Report of the Presiding Commissioner, dealt with inter-system procedures of the New York Power Pool in times of "major emergency."

proceeding on May 24, 1971 with a notice inviting written comments by June 14, 1971. Comments were filed by the City of New York, the County Attorney of Westchester County, Consolidated Edison, Owners Committee on Electric Rates, Inc. ("Owners Committee"), Rochester Gas and Electric Corporation and the Commission's staff. Upon the application of the City of New York, the Commission, by notice to all parties served on June 15, 1971, scheduled oral argument for June 30, 1971 on the issues raised by the Report and the comments. There being little dispute as to the first 23 load-shedding steps recommended by the Presiding Commissioner in the Report, our order of June 23, 1971 adopted them in slightly modified form, as an interim measure, "without prejudice to their revision following full Commission consideration." Now, after oral argument, we affirm the decisions reached provisionally in the order of June 23 and dispose of the remaining unresolved issues upon which the parties were heard.

Scope of the Problem

Consolidated Edison provides electric service to virtually all of the City of New York and to portions of Westchester County, including the cities of Yonkers, White Plains, Mount Vernon, New Rochelle, Peekskill and Rye.

In the summer of 1971 and, it appears, for a number of summers to come, the New York metropolitan region may be forced to adjust to shortages of electric power serious enough, at least, to cause inconvenience and, at worst, to weaken the capacity of both the city and its surrounding areas to function. This order, and the proceeding from which it stems, are not addressed to the causes for this deficiency in an urban region which, ironically, epitomizes the age of electricity. Nor does it deal with the remedies for that deficiency--remedies which must provide the means of accommodating, without fatal delay, our concern for safeguarding the environment and our inescapable needs for additional sources of energy. We deal here only with the immediate consequences of and responses to the power deficiency. Our choices, therefore, are confined to the least bad among painful alternatives.

The able and comprehensive Second Report of Commissioner Jones--which we adopt in this Opinion except to the extent that we indicate our disagreement--carefully analyzed the expected power demands upon Consolidated Edison this summer and its ability under several different major assumptions, to supply those needs. In brief, it was estimated that the Company's peak demand

might reach 8,150 MW in the current summer and in some contingencies go higher.^{1/} If the company's largest generator, Ravenswood No. 3 ("Big Allis") remains in service, it was predicted, the system would have an operating capacity (after giving effect to an expected high incidence of forced outages and unit deratings, as well as other expected capacity losses) of not more than 7,527 MW. This, it was noted, would not meet the anticipated system peak of 8,150 MW nor the system demand for the 75 hours of highest usage (roughly 17 days). (Report, p. 3.) If Ravenswood No. 3 was not in service, the Company, it was estimated, would have operating capacity of only 6,527 MW, insufficient to meet the system peak and inadequate to meet system demands for the 500 hours of largest demand. (Report, p. 4)

Consolidated Edison's Emergency Plans
and the Revisions Proposed in the
Report and in the Comments of the
Parties

In the course of the hearings in this proceeding, Consolidated Edison proposed a sequence of 25 emergency steps, to be put into effect as power deficiencies

^{1/}As at July 31, 1971, the highest demand upon Consolidated Edison in the summer of 1971 was 7,729 MW, reached on July 7. However, there were no severe or prolonged heat waves during the included period and measures to obtain voluntary reduction of demand had had some effect.

developed. The Report adopted the first 18 steps, proposed that the priorities of several others be changed and recommended deletion (with minor exceptions) of Consolidated Edison's Step 24, which called for slowed down, "series operation" of New York City subways. (Report, pp. 57-59.)

The Report rejected, as lacking in sufficient standards, Consolidated Edison's 25th step, calling for "disconnection of additional load as necessary." As a 24th step, the Report recommended adoption of a Commission staff proposal that, in extreme circumstances, Consolidated Edison disconnect major buildings and industrial customers. (Report, pp. 60-63.)

The Report also proposed a ban on electric service to new construction in the Consolidated Edison service area.

(Report, pp.72-74.) In its comments, staff suggested that this last proposal be limited and modified so as to provide that only interruptible service would be available from Consolidated Edison to new nonresidential construction and then only if the new buildings were provided with adequate auxiliary power equipment. Staff also proposed that, as a conservation measure, tenants of buildings hereafter constructed be separately metered and billed by the Company.

Procedures Agreed Upon
and Those at Issue

From the comments filed by the parties, it appeared that there was no dispute of any kind with respect

to Steps 1-19 and Step 22, listed in the Report. They were accordingly approved in our order of June 23, 1971 and are now again affirmed without further discussion.

Objections of various kinds were expressed at the hearings and in the comments with respect to Steps 20 (reduction of voltage by 8%), 21 (cutting off heat in New York subway cars), 23 (disconnecting areas of low population density) and 24 (disconnection of major buildings and industrial customers). At the June 30 oral argument, however, discussion was confined to the Report's proposed Step 24 and to the proposals for withholding service to new construction and for separate metering and billing of tenants/ nevertheless, the issues raised by the comments are all before us. Moreover, with respect to Step 23, the Commission itself, prompted by the findings in the Report, has reserved certain questions which require comment. We shall, therefore, touch upon the full range of objections in turn.

Reduction of Voltage by
8% - Step 20

The Owners Committee--without support from any other party--urged in its comments that 8% reduction in

voltage be deferred until after disconnection of low density areas (Step 23) has been resorted to. It relied upon a "survey" it conducted of "20 large industrial and commercial users" which, it claimed, showed that "more than 50 percent would be unable to continue operations with an 8% voltage reduction because of such factors as dangerous elevator conditions" and that electric motors would be damaged. At the hearings, the Owners Committee refused to identify the companies surveyed, claiming that their replies were confidential. At the subsequent oral argument, as noted, the issue was not discussed.

The Owners Committee's vague and unreliable evidence, not subject to cross-examination, is more than outweighed by the careful study of the problem of 8% voltage reduction--based on substantial evidence in the record--contained in the Report (pp. 13-23). The Report does not minimize the inconvenience or the occasional hardship that will be caused by an 8% reduction. Improperly adjusted elevator motors, X-ray apparatus, computers, and time-sensitive industrial processes may be impaired. Other motors may overheat. The Report concludes, however, that proper maintenance, adequate warning and the installation of available tripping or compensating devices (many machines already have them) can prevent most of the adverse

consequences of reduction in voltage. On the other hand, there is no way of minimizing the discomfort and economic loss to the large populations of the areas designated for disconnection under Step 23. As we shall point out, it is important to limit the duration and frequency of area disconnections as far as possible. On balance, we have no doubt that the conclusions of the Report should be accepted over the contention of the Owners Committee, and that 8% voltage reduction should precede any resort to disconnection of outlying areas.

Mitigating the Effects of
8% Voltage Reduction

We endorse the recommendations of the Report (p. 49) that Consolidated Edison improve its procedures for mitigating the effects of 8% voltage reduction:

1. The Company, in consultation with its large customers, and with any others whose special problems are known, should recommend modifications of wiring, equipment or procedures which might lessen the impact of a drop in voltage. Particular attention should be given to elevator controls and adjustment.

2. The Company should make it generally known, through its advertising and broadcast announcements, that emergency appeals for power conservation are signals that 8% voltage reduction may follow. There is no need, however, for such an announcement to accompany general educational appeals for energy conservation.

3. Although it has not been feasible for the Company, this summer, to provide an information telephone number for the public, with adequate lines and prerecorded announcements, as the Report suggested, the Company should begin now to arrange such facilities for next summer. In the meantime, the Company should expand, to the fullest reasonable extent, its list of business customers receiving direct notification and should make information numbers available to other small businesses.

Cutting Off Heat in Subway
Cars - Step 21

In Consolidated Edison's plans, cutting off heat in New York City subway cars was proposed as Step 19, preceding 8% voltage reduction, Step 20. This is a winter remedy only and of problematical importance in view of the fact that winter loads are far lower than summer requirements, despite the power shortages of last winter. Because of the hardship to the large population dependent on the City's subways and of the danger to its health, the Report recommended (p. 58) that this step be deferred until after 8% voltage reduction, unless car temperatures, with heat turned off, were expected to remain above 55°. It recommended also that the step be eliminated whenever car temperatures were expected to fall below 45°. Consolidated Edison urges that we retain its original Step 19 until it has obtained and reported the views of the Metropolitan Transportation Authority. For the time being, we are persuaded by the arguments in the Report and adopt its conclusions. If important reasons to the contrary are advanced by MTA, Consolidated Edison may apply for reconsideration of the question.

Disconnection of Low Density
Areas - Step 23

The necessity for disconnection, at times of extreme emergency, of areas relatively low in density of population and incidence of high rise buildings is accepted

in principle by all parties.^{1/} Commissioner Jones' Report painstakingly canvassed the many difficult and delicate considerations involved in the decision to deprive entire areas of electric power, however briefly. It also weighed the serious problems which will attend resort to the procedures suggested as possible alternatives to area disconnection--i.e., disconnection of skyscrapers and large industrial customers (Report's proposed Step 24) or slowed down operation of subways (Consolidated Edison's proposed Step 24). We reject both of these alternatives for the reasons stated below (pp.20-27). We concur with the Report, and with all parties who have been heard, that if the twenty-two steps culminating in 8% voltage reduction are insufficient to avert an overload, area disconnection will be necessary to avoid system breakdown and damage to basic equipment. We affirm Step 23, therefore, as recommended in the Report and adopted in our order of June 23, and consider only some problems in its implementation.

^{1/}The comment submitted by the County Attorney of Westchester County stated that "under no circumstances should any order be made. . .whereby the residents and facilities of Westchester County would be burdened under a disproportionate load reduction." No support was offered for the position, nor was it further defined, either in the written comments or at the oral argument. If the comment be deemed an objection it is disposed of by our Opinion.

Rotation of Area Disconnections;
Time Limits

Because of the disruption to be anticipated from prolonged or repeated disconnection of electric power in any one area, the Report recommended (p. 50, see also pp. 60-61) that the burden of disconnection be rotated among the designated areas and that the duration should be one hour, if possible, with an outside limit of two hours. Consolidated Edison urges that these limits be deemed guidelines. It points out that under some conditions it will be impossible to rotate the disconnection areas within the geographic or time limitations suggested. It notes, for example, that "internal transmission difficulties caused by outages may dictate a particular geographic pattern for load shedding."

Consolidated Edison will not, of course, be required to do more than is feasible at the critical time. That, indeed, is the premise on which the entire emergency program rests. The Commission will expect, nevertheless, that when Step 23 must be resorted to, the burden of the emergency will not be unfairly or excessively imposed on particular groups or localities. The variety of circumstances in which an emergency may arise, and the need for swift response by the system, make it inadvisable--indeed, dangerous--to set down rigid and inflexible rules in advance.

The recommendations of the Report concerning rotation of areas for disconnection are to be recognized, however, as the standard by which, when circumstances allow, the Company is to be guided in implementing Step 23. The Commission's staff is directed to remain in close communication with the system operators whenever area disconnections are required and to monitor the Company's adherence to these standards.

In view of the wide distribution of battery-powered radios we approve the Company's plans for relying on broadcast announcements for informing the public of the extent and duration of area disconnections.

Other Safeguards Required
for Area Disconnection

Disconnection of the electric supply to entire areas cannot be allowed to imperil essential services nor, by disabling the pumps in sewage disposal systems, to add excess pollutants to the metropolitan environment. The Commission's hearing and the Report disclosed important problems of this kind for which the Company had not made adequate provision in its emergency plan. The recommendations in the Report, and the efforts of the Commission's staff in consultation with the Company, have resulted in significant planning improvements. Some of them, which should reduce the hazards of area disconnection if that step becomes necessary, are briefly discussed below. We also note some matters requiring further attention.

a. Flushing Network

The last area to be disconnected under Consolidated Edison's plans for implementing Step 23 is the Flushing Network (affording 195 MW of relief). The Report noted (pp. 51-52) that the Flushing Network served indispensable pumping stations of the Jamaica Water Supply Company, as well as New York City's sewage treatment plant on Tallman's Island in Queens. It recommended that the Flushing Network be excluded from the Step 23 procedures unless adequate provision was first made for these critical installations. These measures have now been taken. Arrangements have been made with Jamaica Water Supply Company which will permit it to operate within normal limits for a period of approximately 3 to 4 hours. Consolidated Edison has also devised a procedure for reconnecting the Tallman's Island sewage plant. The reconnection procedure, involving many manual operations at various points in the network, will require up to two hours to complete; consequently, it will be employed only when it is expected that the Flushing Network will be disconnected for longer than that time. The Company is directed to study means of shortening the time for reconnection. Meanwhile, the new procedure will limit the discharge of raw sewage from the plant to about two hours. While even this much is undesirable, it will add no more to the pollution of

surrounding waterways than would a prolonged rainstorm, which always results in an overflow of untreated waste. The Flushing Network may thus be retained in the area disconnection plans.

b. Miscellaneous

Consolidated Edison has responded satisfactorily to other important recommendations in the Report:

Apart from Tallman's Island, four other City sewage stations which cannot withstand prolonged outages have been eliminated from the Company's load shedding plans.

The Company has arranged that all Bronx drawbridges will be closed before their power is cut off.

An independent feeder line, not subject to disconnection, has been provided to the Grasslands Hospital complex in Westchester. The Company is making acceptable progress in its review, with Westchester municipal authorities, of the needs of sewage and water pumping facilities in that area; the study should continue. The Company has notified the three fire departments in Westchester which lack auxiliary power that they should provide themselves with alternate sources and means of communication.

The Company is recording the location of all life-sustaining apparatus such as iron lungs, is advising the affected customers to arrange for emergency power and

is establishing a priority list for the restoration of current. Some emergency generating equipment will be provided.

The Report recommended that the Company make a detailed study of high rise buildings within areas presently subject to disconnection. The Company, we are informed, has maps containing much of the required information; these data should be submitted to the Commission. A sampling study should also be made of any additional areas considered for disconnection and the results should be submitted to us.

Proposed Steps In Addition To Step 23

The remaining area of controversy--and the one on which oral argument centered--is whether contingency plans more drastic than Step 23 should be adopted. The proposed further measures include (i) disconnecting major buildings (recommended by the Report), (ii) slowed down or "series" operation of subways (urged by Consolidated Edison), and (iii) at longer range, denying service to new construction (suggested by the Report and, with variations, by staff).

So devastating would be the impact of any of these measures on the life of the City, on the health and safety of its inhabitants, and the preservation of its status as an economic capital of world importance, that we must closely scrutinize the premises upon which these proposals are founded.

In the accompanying opinion of Commissioner Jones (dissenting in part), the question is "simply stated" as follows: "[W]hat happens if Con Ed exhausts the 23 steps prescribed in the Commissioner's order and still is unable to bring demand for electric power into line with available supply?" The question, however--far from simple--suggests a prior one. Are there, in point of fact, reasonably probable circumstances under which the 23

steps--and particularly, the 23rd--may be "exhausted" without reducing demand to the level of supply? To know the answer we must consider (i) what load relief may be required at a time when Step 23 is invoked and (ii) under what circumstances the relief capacity of Step 23 should be deemed "exhausted."

The report estimated that if Ravenswood No. 3 is in service and "typical" conditions prevail, no Step 23 relief will be required at all. (pp. 10-11.)

If Ravenswood No. 3 is out of service and conditions remain "typical," then, after resort to 8% voltage reduction, only 66 MW of relief will need to come from Step 23. (p. 11.)

If Ravenswood No. 3 is in service and other conditions are "adverse"^{1/} there should be little or no capacity deficiency after 8% voltage reduction.^{2/} (pp. 11-12.)

Only if the worst of all circumstances coincide, that is, if Ravenswood No. 3 is out of service and "adverse" conditions also prevail, will the estimated

^{1/}"Adverse" conditions include a rise in demand of 250 MW beyond the estimated peak, and forced outages and unit deratings totalling as high as the 3,748 MW reached in the week ended March 27, 1971.

^{2/}An estimated gross deficiency of 1,546 MW would be overcome by the 185 MW relief afforded by voltage reduction and 1,372 MW afforded by prior steps, a total of 1,557 MW.

deficiency, after 8% disconnection, be sizeable: the Report considered that it might reach 989 MW. (pp. 12-13). Of this prediction, however, the Report itself states: "[T]he combination of adverse circumstances supposed in [making the estimate] is unlikely to occur, or to persist for a prolonged period" (p. 13). In this evaluation we concur. We go on, as well, to assess other risks and probabilities the overall balance of which must guide us in carrying out our responsibility.

We note, preliminarily, that in estimating the peak deficiency, the Report assumes (p. 11) that no more than 400 MW can be saved by appeals for voluntary curtailment, an amount less than 5% of the estimated 8,150 MW peak. This estimate seems conservative. It was reached moreover, before the inception of Consolidated Edison's "Save-A-Watt" program which the company claims (though without independent verification) reduced demand by over 300 MW on at least one day. And the "adverse conditions" postulated as part of the basis for estimating the 989 MW shortage include an increase in demand of 250 MW (p. 12) over the already high 8,150 MW peak regarded as "normal". We believe it is likely that, when crisis conditions develop, not only can demand be maintained by voluntary means at a level no higher than "normal" but can, in fact, be significantly reduced.

Viewing the matter more broadly, we find insufficient reason for subjecting the City to the economically and socially hazardous measures proposed. We cannot ignore the fact that, as against the assumed 989 MW maximum deficiency, of questionable probability, the load relief available from a two hour disconnection of low density areas under Step 23 --

if all areas are disconnected at one time---is 1,712 MW.^{1/} (Report pp. 25, 60-61.) If less than all the areas are disconnected at one time, impressive amounts of relief are available for much longer periods. For example, disconnection of 50% the available area for two hours at a time, in rotation, would yield 856 MW for four hours. Dividing the total area into thirds would provide 571 MW of relief for six hours--an unlikely duration for an overload of the size assumed. And in all the foregoing examples, no area would be disconnected more than once a day.

If even more extended relief were required--and we are now at the outer margin of plausibility--the Report has by no means demonstrated that all the low density areas subject to Step 23 would, as a matter of technical feasibility (having regard to water supply, firefighting capacity and sewage disposal) be unavailable for disconnection more than once a day. Nor is it established that none of them could be disconnected for more than two hours at a time. If, for example, after the first disconnection, areas containing critical facilities (e.g., the Flushing Network) were excluded, the remaining areas might well be able to withstand one or more further interruptions. Assuming a total of 1,417 MW available in such less critical areas,^{2/} one hour alternations of 50% of the total would

^{1/}1,780 MW less 68 MW exempted for preservation of critical facilities.

^{2/}Deducting the Flushing Network's 195 MW from the 1712 MW available under Step 23 leaves 1517 MW. Another 100 MW may be allowed for additional exclusions of critical facilities, beyond the 68 MW deemed sufficient for this purpose by the Report (p. 60.)

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yield 708 MW of relief for periods beyond the six hours mentioned in the preceding paragraph. In the absence of a showing that such selective disconnections are truly hazardous rather than inconvenient, we must decide--responsibly, and without exaggeration or melodrama--whether, even to the residents of the outlying areas, the City's viability is not more important than the minimizing of physical discomfort.

In sum, the case for going beyond Step 23 rests, in part, on the assumption that a combination of events will occur the coincidence of which, all parties recognize, is highly unlikely. It rests, further, on an underestimate, in our judgment, of the capacity of Step 23 to afford relief even in emergencies at the outer range of plausibility. Against this position we must weigh the obvious and certain hazards of adopting extraordinary measures which, in all likelihood, will prove either unnecessary or unavailing. Our appraisal of the relative probabilities and risks leads us to conclude that such measures--to which we now turn--must be rejected.

"Series Operation" of Subways

We concur entirely in the recommendation of the Report that, on the basis of present information, a slow-down of the City subways to half-speed during any but the quietest hours is unacceptable as a means of reducing Consolidated Edison's power load. The only trial of this procedure, on July 20, 1970, resulted in jamming and overflow of stations and in conditions described by a City official as "so electric, there was some concern by the Police Department that you may have riots and

people may be injured or thrown off platforms." (Report, p. 39.) The Company urges retention of this step in its contingency plan, promising to work out safe procedures with the City and the MTA. Although we deny this request for the present, our action is without prejudice to reconsideration should the Company come forward with a plan assuring the public safety.

Disconnection of Major Buildings - A proposed Step 24.

The Report proposed that, in lieu of extending area disconnections beyond two hours a day, the Company disconnect major office buildings, industrial customers and department stores. Under the original proposal, advance notice would be given the night before or, on the basis of the 4 A.M. weather forecast, early in the morning. Responding to the parties written comments and oral argument, Commissioner Jones now concedes the unreliability of forecasts. Instead, he proposes that the decision to disconnect await the actual developments of the day, and that, if load relief is needed, the occupants of the selected buildings be given one hour's notice to evacuate. This sudden alarm would not be confined to just a few buildings: the Company estimates, without contradiction, that to achieve the equivalent of the 195 MW load relief obtainable by disconnecting the Flushing Network, the 42 largest buildings in the City would need to be evacuated and deprived of service. Even the need for an hour's notice risks either that the building disconnection will come too late to avail, or that it will prove

to have been totally unnecessary.

The consequences of adopting such a proposal, whether in its original or revised form, are well described in Commissioner Jones' Report itself (pp. 62-63):

"Closing commercial buildings--perhaps unnecessarily--will have widespread economic effects. Workers paid by the hour--often the lowest income worker--will lose needed wages. Proprietors will sustain economic losses, which will make New York City an increasingly unattractive place to do business. And persons dealing with the affected enterprises will be inconvenienced by missed appointments, delayed shipments, wasted trips, and the like. All of these adverse consequences are not to be minimized...."

This disruption of the City, it must be emphasized, is recommended to us not because no alternative exists, but only because the alternative of disconnecting some of the primarily residential areas outside of Manhattan for more than two hours a day, in extreme emergencies, is said to be less tolerable. We cannot accept this as a responsible choice. Much as we regret the individual inconveniences and losses entailed by area disconnection, we believe it is the lesser of the evils. The intrinsic economic difficulties of a City already heavily burdened should not needlessly be compounded. We are mindful of the need for assuring the maintenance of firefighting capacity and other critical services in outlying areas subject to disconnection. As already indicated, we intend that this be accomplished by excluding from more than one daily interruption,

wherever possible, any area, or severable part of one, which includes critical facilities not otherwise supplied with power.^{1/}

If, after resort to even the more extended, selective disconnections we have just discussed, the first 23 Steps failed to meet a power crisis, the drastic measures proposed as Step 24 might have to be considered and the useful analysis in the Second Report brought into play. That situation, we believe - and this Commission has not minimized the urgency of the City's power problem and does not do so now - has not been reached. All energies, in our judgment, should now be directed to the root problem of assuring sufficient added generating capacity in ways that will safeguard our environment. On this point, there are no differences among us.

Denying Electric Service
To New Construction

What we have already said goes far to indicate our views on the varying proposals made in the Report, and by staff, to withhold electric service to new or substantially remodelled buildings.

^{1/}The Report refers to some 1,100 "high rise" buildings in the disconnectable areas. The definition, however, includes any structure of more than six stories. More information should be obtained as to how many of these are, e.g., in the category of 7-10 stories, and how many are truly dependent on elevator service in the same sense as a Manhattan skyscraper.

At the oral argument all parties other than the original proponents of these measures were vehement in their opposition. Representatives of the City of New York, the County of Westchester, business interests and the Company all saw in the proposals a possibly fatal blow to the economy of the metropolitan region. With construction effectively blocked, employment would plummet, satellite businesses would suffer and the decline of the City would be assured.

There can be no doubt, of course, that this great region will face awesome difficulties if Consolidated Edison does not, reasonably soon, acquire additional generating and power import capacity. It is to that solution, however, that all energies should be turned and not to measures that so plainly invite economic disaster.

Requiring Auxiliary
Power in High Rise Buildings

Notwithstanding our conclusion on specific proposals, we welcome the Report's careful analysis of the hazards resulting from loss of power to high rise buildings during emergencies. Power losses may be caused not just by system-wide shortages of energy but by local and temporary breakdowns as well. It may be that municipal building codes should be amended to require that buildings of a certain height be provided with sufficient auxiliary power sources to operate elevators and illumine corridors and stairwells during emergencies. The installation of such equipment might possibly be made a condition

to receiving electric service or to qualifying for certain rate classifications. Obviously, the situation differs as between new and old buildings. In all cases problems of cost, practicality and environmental impact must be considered. In view of the importance of the subject and the need for further information we are directing that the present proceeding be broadened to include this topic within its scope and that the matter be inquired into in subsequent hearings.

Separate Metering and
Billing of Tenants

Staff proposed a requirement that tenants in all new buildings be separately metered and billed by Consolidated Edison. It is argued that tenants will be induced thereby to conserve power. That result would, indeed, be a valuable one if it were of sufficient magnitude and could be accomplished at reasonable cost. Both Consolidated Edison and the Owner's Committee question staff's premises, however, and urge that there is insufficient information before the Commission to support a decision. We agree that the record is insufficient to guide us on the issue. We direct therefore that this subject, as well, be added to the current proceedings and be included in forthcoming hearings.

The Commission orders that:

1. Consolidated Edison Company of New York, Inc. ("Consolidated Edison") is directed to give effect to and carry out the following sequence of emergency procedures, as needed, whenever its available supply of electric power is insufficient to meet demand:

1. Bring all units to sustained rating (except any unit limited by silica).
- *2. Purchase additional power, if available, from external sources.
- *3. Place gas turbines in service at base load.

*The system operator is permitted the discretion of alternating the sequence of Steps 2 and 3 based on economic considerations.
4. Bring Group I stations to short time ratings.
5. Request Group II stations to exceed sustained ratings by maximum possible without making smoke.
6. Increase loading of gas turbines to peak rating.
7. Disregard silica limitations on any units applicable.
8. Bring Group I stations to maximum ratings.
9. If not already done, arrange for leased boiler plants to start.
10. Import extraordinary supplemental power.
11. Curtail load on Consolidated Edison's own facilities.
12. Insure that New York Power Pool Dispatcher has requested Pool members to prepare for voltage reduction.
13. Place in service any gas turbines undergoing active construction work but capable of operating, at permissible rating, up to peak rating.

14. Reduce voltage by 3%.

**15. Request large customers to reduce loads (telephonic requests).

**16. Request all customers to reduce loads (public appeals via mass media).

**These steps are to be initiated at any point in the procedure where it becomes apparent that steps beyond No. 17 will be necessary.

17. Reduce voltage by 5%.

18. Obtain emergency generation, if available, from the Power Authority of the State of New York, involving emergency release of Lake Ontario water.

19. Increase Group II stations to maximum ratings.

*20. Reduce voltage by 8%.

*21. Request traction customers (subway system) to cut off heat on operating cars.

*Step 21 is available only during the heating seasons. It may be employed only where the temperature in subway cars will not be reduced below 45°F. If heat in subway cars will not be reduced below 55°F, Step 21 may be employed in advance of Step 20.

22. Request assistance from upstate aluminum plants if transmission capability permits.

***23. Disconnect load, as necessary and/or as requested by the New York Power Pool Dispatcher, in the less densely populated areas identified in these proceedings as suitable for emergency disconnection, to the extent and in a manner not inconsistent with the foregoing opinion.

***Subways may be transferred to "series operation" as an alternative or supplement to this step but only on weekends or during the hours of 8:00 p.m. to 6:00 a.m. on weekdays.

2. This order does not preclude Consolidated Edison from taking further load curtailment measures if they should be necessary to meet its obligations under the New York Power Pool agreements, or, in rapidly developing emergencies, from taking manual or automatic load reduction measures varying from the foregoing prescribed sequence, provided that, as soon as possible thereafter, Consolidated Edison shall give effect to the prescribed sequence.

3. Consolidated Edison is directed to continue to pursue efforts, in consultation with the staff of the Commission and municipal officials of the areas affected by the foregoing procedures, to assure protection to critical facilities in those areas.

4. This proceeding shall extend to, and there are hereby added to the matters to be investigated herein,

a. The desirability and feasibility of requiring the owners of elevator buildings and other large consumers of electricity in the State of New York to install auxiliary power sources for the purpose of operating elevators and illuminating corridors and stairwells in case of emergencies which interrupt their normal power supply;

b. The desirability and feasibility of requiring that tenants in newly constructed or remodelled multiple occupancy buildings in the State of New York be separately metered and billed by electric utility companies.

5. This proceeding is continued.

By the Commission,

(SEAL)

(SIGNED)

SAMUEL R. MADISON
Secretary

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

AUG 11 1971

CASE 25937 - Proceeding on motion of the Commission as to the plans and procedures of electric corporations for load shedding in times of emergency.

WILLIAM K. JONES, Commissioner, concurring in part and dissenting in part:

I agree with the priorities, procedures and conditions established in the Commission's opinion and order in this proceeding. However, the Commission has not gone far enough in my judgment in dealing with the problem presented.*

Simply stated, the question is what happens if Con Ed exhausts the 23 steps prescribed in the Commission's order and still is unable to bring demand for electric power into line with available supply? There are a number of possible answers, but I do not consider any of them to be satisfactory.

First, the Commission apparently considers that Con Ed's position has improved to the point where it is unlikely that it will prove inadequate. While recent events have provided some encouraging signs, I do not think that anyone can predict with certainty that Con Ed's future power position is secure. Too much depends on the vagaries of weather, the performance of Ravenswood No. 3, the forced outage rate on the remainder of Con Ed's system, and the availability of

*I will reserve comment on possible limitations on electric service to new structures in Con Ed's service territory in view of the Commission's remand of related aspects of the proceedings for further hearing.

imported power. (Some of these matters are discussed subsequently in greater detail.) Moreover, even if the possibility of a severe power shortage were considered to be remote, the consequences of such a shortage are sufficiently severe that every precaution should be taken to minimize adverse effects.

Second, it is possible that, if a severe power shortage should materialize, the Commission could take actions at that time to minimize adverse effects. But surely it is poor planning to wait until a severe emergency impends before taking necessary precautionary measures. Selection of the least harmful remedies is not likely to proceed with careful deliberation in an atmosphere of crisis.

Third, in the event of an unexpected severe power shortage, Con Ed may be expected to do something even in the absence of Commission action. Unquestionably this is true. Con Ed is not going to sit by and see its total system destroyed by a prolonged imbalance between supply and demand. But what will Con Ed do? If Con Ed has no detailed contingency plans, it is in no better position than the Commission. If Con Ed does have detailed contingency plans, they should be submitted to the Commission for review. That was the whole purpose of this proceeding.

As a practical matter, if a severe power shortage develops, Con Ed can resort to two steps (singly or in combination) in addition to those prescribed:

I. Con Ed can disconnect customers in areas other than those included in territories presently subject to disconnection. However, to permit such a course of action makes a mockery of the Commission's efforts to secure vital services in areas subject to disconnection. On oral argument, Con Ed's spokesman indicated that it was almost impossible to extend the areas subject to disconnection without interfering with subway operations. And within these presently protected areas there are some 17 to 19 hospitals lacking auxiliary equipment, vital water pumping stations and sewage plants, congested traffic arteries (including electrically operated bridges), and concentrations of high-rise buildings. To permit Con Ed to disconnect additional areas, without careful review of the consequences, is to flirt with disaster.

II. The alternate course of action is for Con Ed to confine disconnections to the areas presently covered by step 23, but to disconnect these areas for as long -- and to repeat disconnections for as often -- as might be necessary to achieve the needed curtailment in demand. If time limits on disconnection are loosened, and frequent repetition is permitted, substantially more load relief can be obtained from the portion of Con Ed's

system subject to disconnection. However, this course of action not only is inequitable to the minority of Con Ed's customers who would be affected; it also is extremely dangerous to public safety and health. For the basis upon which many of the vital water and sewage facilities in these areas were found to be protected against adverse impact was the premise that electric outages would not exceed two hours in duration. If disconnections last longer than that interval, or are repeated at short intervals, the ability of water systems to maintain pressure and of sewage systems to "hold" sewage is open to serious question. Moreover, there are in excess of 1,100 high-rise buildings (six or more stories) within the areas subject to disconnection, and these present special problems of their own.

I find it difficult to believe that, by this order, the Commission intends to provide Con Ed with a license (I) to extend area disconnections to territories where provision has not been made for protection of vital facilities, or (II) to permit prolonged or repeated disconnections of power in areas subject to step 23 with all the health and safety hazards associated with failure of water supply and sewage disposal. And, for reasons previously indicated, I do not believe that it is reasonable or proper simply to assume that the problem will not arise.

How is the problem to be met? I have no quarrel with the view that the first 23 steps should be exhausted before recourse is had to any measure that would seriously interfere with the economic life of the New York City area. The protection of the economic viability of the city, and the many livelihoods dependent upon it, is more important than the limited individual hardships or discomforts that may be occasioned by implementation of the first 23 steps. However, protection of public health and safety is a matter of greater consequence.

In the Second Interim Report it was recommended that, after the first 23 steps had been exhausted, and in order to avoid repeated or prolonged interruptions of power in the "less densely populated" areas subject to disconnection, Con Ed should prepare a plan for the disconnection of large nonresidential buildings in other parts of its service area. While I am persuaded, on the basis of briefs and oral argument, that some modifications of the recommendation are in order, I believe that the concept remains sound. An examination of Con Ed's service load curves reveals that summer peak loads occur during the business hours of business days and are primarily the result of the office buildings, stores and other commercial premises served by Con Ed. If significant load reductions are to be achieved after all other steps are exhausted, commercial enterprises will have to be disconnected.

But if commercial enterprises are to be disconnected, two conditions must be met. Buildings must be disconnected one at a time in order to avoid the disconnection of vital facilities in the same area. And, in order to avoid trapping occupants in elevators or on upper stories, buildings should be evacuated prior to disconnection.

In order to meet these conditions, it was recommended that, when confronted with the prospect of a severe or prolonged power shortage, Con Ed should disconnect buildings in the early hours of the morning before their occupants arrived. A number of objections were raised to this proposal, some more weighty than others. But one particularly significant point concerned the difficulty of predicting in advance the extent to which load relief would be required on a given day. Thus, buildings might be disconnected and closed on the basis of a pessimistic prognosis, when, as a result of a change in one or more highly variable conditions, it subsequently developed that adequate power was available to supply the buildings. Another point vigorously pressed was the seriousness of the circumstances that would warrant disconnection of buildings--how bad must things become in areas subject to disconnection under step 23 before large buildings in other areas would be disconnected?

Both problems can be met by revising the method of implementation of the proposal as follows:

Whenever Con Ed is forced to disconnect such a large proportion of load that rotation of disconnected areas within two hours is not reasonably likely, or whenever Con Ed is forced to

disconnect an area for a second successive day without assurance from local officials that the repeated interruption will not impair water supply or sewage disposal, Con Ed will immediately begin to disconnect nonresidential buildings in other areas as rapidly as possible so that it will be in a position to restore power to areas subject to prolonged or repeated interruptions. Disconnections will take place after building owners have been given one hour's notice to evacuate their buildings, and will proceed whether or not the owners choose to cooperate with Con Ed.

These conditions should minimize situations where buildings are disconnected unnecessarily, since such disconnection is premised on a need to restore service to disconnected areas. And the standard is framed in such a way as to link the disconnections of buildings to the criterion of public health and safety in the areas already disconnected. Disconnection of individual buildings may be awkward for Con Ed, and painful for businesses, employees and other affected parties. But where public health or safety is at stake, some sacrifice of economic interests is required.

Two further points require elaboration:

Questions were raised as to how buildings would be selected for disconnection. Since the recommendation was that Con Ed submit a plan to implement the proposal, matters of detail are perhaps premature. However, the critical ingredients can be anticipated. To facilitate the operations of Con Ed's switchmen,

buildings probably will have to be grouped and small buildings will have to be excluded. Vital facilities also should be excluded (including hospitals, transportation and communications facilities, and water supply and sewage facilities). Subject to these constraints, the most equitable guidelines would appear to be: (a) to disconnect newer buildings in advance of older ones (on the ground that the more recent the building, the more knowledge can be assumed on the part of owners and tenants as to the inadequacy of power supply in New York City), and (b) to disconnect all large buildings once, for a given period of time, before proceeding to disconnect any building a second time.

Questions also were raised as to certain business firms which operate around the clock, seven days a week, as communications centers of world-wide activities. Unfortunately, it is not possible for the Commission or Con Ed to protect these activities while disconnecting the remainder of the building involved. However, this problem could be resolved if either the City of New York or the affected building owners cooperated in a program to substantially curtail power consumption in large nonresidential buildings in times of severe or chronic power shortage. It would be possible, in lieu of disconnecting a building, to arrange for Con Ed to accept the commitment of the City or the building owner to close the building to all but "Sunday operations," with appropriate limits on the use of air conditioners and elevators.

However, neither the City nor the building owners are willing to cooperate in this approach to ameliorating the consequences of a power shortage. Their position is understandable. The economic viability of New York City is threatened from many quarters, and the recurrence of electric power crises has not enhanced the City's image. In the twelve months ended March 31, 1971, the New York City area lost 88,000 jobs, 72,000 of them within the City itself. Moreover, as pointed out in the Second Interim Report:

"Closing commercial buildings...will have widespread economic effects. Workers paid by the hour -- often the lowest income worker -- will lose needed wages. Proprietors will sustain economic losses, which will make New York City an increasingly unattractive place to do business. And persons dealing with the affected enterprises will be inconvenienced by missed appointments, delayed shipments, wasted trips, and the like."

Yet this situation is but a specific illustration of a more general phenomenon. Economic progress is vitally dependent upon adequate supplies of energy, including electric power; no one has yet suggested a means by which commercial and industrial enterprises can be made viable in the absence of adequate supplies of electric energy supplied on a reliable basis. Moreover, the point of supporting economic progress is not simply to advance the fortunes of business enterprises. The livelihoods of millions of persons are dependent upon the continued viability of the economy of the New York City area, and the least advantaged residents of the area would be the most severely affected by an economic setback. Conversely, the only realistic hope that the disadvantaged have for improvement

of their lot rests with a vigorous and growing economy. Despite a good deal of fanciful rhetoric, it should be plain to even the most obtuse observer that, during a period of economic stagnation, persons with positions and jobs will hang on to them with a tenacity which will more than overcome the efforts of persons further down the economic ladder to improve their economic position.

In short, the relationships are both simple and obvious. Without electric power and other sources of energy, economic progress is impossible. Economic stagnation is the best that can be hoped for, and marked deterioration is the more likely consequence. Furthermore, without economic progress, there is no real hope of improving the economic position of the least advantaged members of society. In a stagnant or deteriorating economy, the plight of the poverty-stricken is rendered hopeless and the living standards of everyone else are placed in jeopardy.

It must be emphasized, however, that these are the general consequences of an electric power shortage. They are not unique to the implementation of reasonable precautions to guard against the immediate adverse effects of such a shortage. And these immediate adverse effects can be very serious indeed.

To consider but a single example, there is the problem of fire.

If, through prolonged or repeated interruptions of power to "less densely populated areas" (including southern Westchester and eastern Queens), pressure is lost in the water systems of local communities, the vulnerability to fire of homes and other buildings within these areas is an obvious hazard.

Less obvious is the vulnerability of high-rise buildings to fire. In the event of failure of power, individuals may be trapped in elevators. Occupants of upper floors may find evacuation time-consuming and difficult if all elevators are disabled even where the fire itself precludes the use of some elevators). Water pressure to the upper floors, maintained by electric pumps, will be lost. And illumination, important for evacuation (especially in corridors and stairwells) and for coordination of fire fighting operations, also will be lost.

The problem is troublesome in the "less densely populated" areas, where there are 1,100 buildings of six or more stories (most of which are presumably of moderate height). But if area disconnections are to be permitted in more densely populated areas, the problem becomes even more acute. Two recent developments illustrate the difficulties and hazards involved.

On July 6, 1971, the New York City Fire Department promulgated tentative rules governing fire emergencies in high-rise buildings. The rules were the result of a study initiated after a fire in One New York Plaza (50 stories) caused two deaths and 35 injuries on August 5, 1970 and a fire at 919 Third Avenue (49 stories) caused 3 deaths and 39 injuries on December 4, 1970. The rules require procedures which, expressly or by implication, assume the existence of electric power. Thus, the fire command stations required in each building shall be "adequately illuminated."

Elevators, not impeded by the fire, shall be employed for evacuation. A "fire brigade" of building employees shall move to the floor below the fire and assist in evacuation and fire control in a variety of ways; presumably, the fire brigade is not expected to run up 30 or so flights of stairs. Evacuation via corridors and stairwells assumes the existence of adequate illumination. No provision is made for persons trapped in elevators or for loss of water pressure on the upper floors of high-rise buildings.

On July 15, 1971, in the first such undertaking in recent memory, a high-rise building (Seagram Building, 32 floors) was substantially evacuated in a voluntary fire drill. Several factors are worthy of note. First, it took thirteen minutes to evacuate the building without use of elevators. Second, some 15% of the building's occupants did not participate, either because of the pressure of "business as usual" or because of a reluctance to walk down a large number of flights. Third, although elevators generally were not employed, a special elevator was required to evacuate 14 disabled persons who work in the building. One can only conjecture on such questions as: How many deaths or injuries would occur in a fire in the 13 minutes required to walk down and out of the building? How much more time would be required for similar evacuation of buildings larger than 32 stories? What would have been the fate of the 14 disabled persons in a fire in the absence of power for elevators?

The fire problems within high-rise buildings would be aggravated, of course, by any traffic problems engendered as a result of loss of power to traffic signals. Moving emergency equipment through congested areas is difficult enough under the best of circumstances. Traffic jams created by loss of traffic signals (or disablement of electrically powered drawbridges) can only make matters appreciably worse.

Thus far, electric power crises have not required extensive load shedding. For the most part, other load reduction measures have sufficed to bring power consumption into line with available supply.* But it is questionable whether much reliance can be placed on this fact in light of the deteriorating power situation in Con Ed's service territory.

In the summer of 1969, according to Commissioner Ryan's report in Case 25293 (the Consolidated Edison service proceeding), Con Ed resorted to voltage reductions on four occasions, appeals to large customers on four occasions, and appeals to the general public on three occasions.

In the summer of 1970, Con Ed resorted to voltage reductions on 15 occasions, appeals to large customers on 12 occasions, and appeals to the general public on 11 occasions. In addition, Con Ed had the subways transfer to series operations on one day, creating a near-riot, and was forced to disconnect customers (aggregating 157 MW of demand) on another day.

*Unintended outages of power, affecting limited areas, generally have occurred at times other than peak business hours. Even the November 1965 Northeast Blackout occurred after 5:00 p.m.

In the winter of 1970-1971, with loads appreciably below summer peaks, Con Ed for the first time encountered capacity deficiencies in winter months. Voltage reductions were employed on 8 occasions, appeals to large customers on 5 occasions, and appeals to the general public on 5 occasions. In addition, heat in the New York City subways was cut off on one cold winter day.

Thus far, the summer of 1971 has been relatively placid, with only a few voltage reductions and several days when power conservation was urged. However, the summer is not yet over (most of the problems last summer occurred subsequent to July 27), and, based on past experience, much will depend on the performance of the erratic Ravenswood No. 3 installation and on the forced outage rate on the remainder of Con Ed's system (which, despite recent improvements, is almost as erratic and unpredictable as Ravenswood No. 3).

Also of significance is the fact that Con Ed has not added any base load generating capacity to its system since Arthur Kill No. 3 in May of 1969. In recent years, the gap between supply and demand has been sought to be met by the addition of increasing numbers of gas turbines. How long this process can continue is questionable.

New base load generating capacity is being challenged at almost every point. Indian Point No. 2 is the subject of a controverted AEC proceeding. Bowline Point (a joint venture with Orange and Rockland) is being held up by environmental conditions in operating permits. And the projected Astoria plant is the subject of continuing controversy.

Con Ed also has been encountering difficulties in constructing the additional transmission facilities necessary to import purchased power. The merits of the controversies concerning new generating and transmission facilities need not be considered at this point. It is sufficient to note that delays incident to such controversies have become a fact of life.

Perhaps others can find in this record some basis for optimism. Maybe we will be lucky and Ravenswood No. 3 will function reliably, Con Ed's forced outage rate will be maintained at reasonable levels, and necessary new generating and transmission facilities will be constructed in timely fashion. It could happen -- almost anything is possible -- but I am reluctant to base Commission policy upon a foundation of momentary improvement and wishful thinking.

In my opinion, the record to date warrants the adoption of precautionary steps beyond the measures adopted by the Commission. Yet it seems to be impossible to obtain support for such action. The reason, I believe, is endemic in our society's general approach to health and safety hazards. Before definitive action can be countenanced, there must be a catastrophe. A power crisis must hit with such intensity that scores of lives are lost and hundreds of bodies mutilated in a fire or other major disaster before a disruption of business activities will be considered. For reasons previously indicated, I believe that it is of the utmost importance

that the economic life of New York City not be subjected to unnecessary interference. But I also believe that the protection of public health and safety is an overriding consideration. For my part, I prefer to act to avoid possible calamities and not wait for justification in the form of dead and mutilated bodies.

BEFORE THE UNITED STATES

ATOMIC ENERGY COMMISSION

In the Matter of)
)
Consolidated Edison Company) Docket No. 50-247
 of New York, Inc.)
(Indian Point Station, Unit No. 2))

CERTIFICATE OF SERVICE

I hereby certify that I have served the attached document entitled "Motion of Applicant for an Order Establishing Further Procedural Requirements to Implement the National Environmental Policy Act of 1969", together with the attachments thereto, by mailing copies thereof first class and postage prepaid, to each of the following persons this 17th day of August, 1971:

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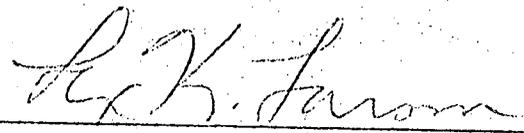
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