50-249

Commonwealth Edison Company

ONE FIRST NATIONAL PLAZA ★ CHICAGO, ILLINOIS

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Regulatory File Cy.

October 18, 1971

Atomic Energy Commission
Washington, D.C. 20545

Gentlemen:

Commonwealth Edison Company holds an operating license, issued April 10, 1971, for Dresden Unit 3, an 809 mwe boiling water reactor. This letter and its enclosures are submitted in accordance with the provisions of Paragraph 3, Section E, Appendix D, of 10 CFR Part 50, applicable to operating licenses issued after March, 1970.

Commonwealth Edison Company submits that there is no basis for the Commission to suspend or limit the Dresden Unit 3 license pending completion of NEPA review. On the contrary, any balancing of the factors set forth in Section E of Appendix D makes it clear that the continued operation of Dresden Unit 3 is imperatively required in the public interest. The data relating to these factors may be summarized as follows:

(a) Operation during the period required for NEPA review will not have any significant adverse effect on the environment.

On the contrary, continued operation of Dresden Unit 3 will achieve environmental gains by avoiding increased coal combustion in inefficient units with limited pollution control facilities.

Resource Commitments Dresden Unit 3 is a completed and operating power station. Continued operation involves no additional resource commitments; interruption would idle and thus waste a large resource investment.

Radiological Effects The issuance of an operating license indicates that Dresden Unit 3 has met all of the requirements of this Commission, its staff and the ACRS with respect to health and safety. The staff, from its examination of the Dresden Unit 3 application for an operating license, concluded:

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"...that on the basis of the conservatism used in establishing radioactive effluent release limits, the extensive environmental monitoring program to be carried out by the applicant, the type and size of equipment to be provided to control effluent releases, and the experience with currently licensed and operating power reactors, there is reasonable assurance that the proposed radioactive waste treatment system will perform as designed and that the radioactivity levels in liquid or gaseous releases from the Dresden Nuclear Power Station will be well below 10 CFR Part 20 limits."

In a contested state licensing proceeding, the Illinois Pollution Control Board (over a challenge of its authority to examine the question) concluded that the unit could be operated without undue environmental impact from the unit's closely controlled radioactive emissions, pending the 30-month period required to install additional facilities to reduce gaseous emissions still further. The proposed additional facilities (which are also designed to meet proposed Appendix I requirements) have been presented by the Company to the Commission for its consideration. Annex A sets forth recent operating data with respect to Dresden Unit 3.

<u>Thermal Effects</u> Although Dresden Unit 3 was designed and built to conform to earlier standards less restrictive than current state standards governing thermal discharges into the industrial waterway on which it is located, the Company has already completed backfitting the unit with a 1,275 acre cooling lake and a spray cooling system which make it possible to meet the new state standards at full load, except under certain temperature and river flow conditions. Later this month, the Illinois Board will consider whether further supplementary cooling devices are required. The Board is expected to allow full power operation of the unit pending the installation of such devices, if required, because of the absence of environmental harm.

In any event, as testimony in the contested state proceeding shows, the receiving stream bears the sewage burden of a major part of the metropolitan Chicago area. Any marked improvement is many years in the future. Certainly no significant adverse effects can be anticipated from the operation of Dresden 3 with present safeguards in the relatively short period prior to the completion of NEPA review. A summary of the data with respect to thermal and other water quality questions is attached as Annex B.

(b) Since Dresden Unit 3 is already in operation, its continued operation will not foreclose any alternative in facility design or operation that might result from NEPA review.

The Commission will not be assisted in its decision-making process by shutting down Dresden 3. All options the Commission has now and will have after full NEPA review will be available with continued operation of the unit.

(c) The effect on the public interest of suspending the operation of Dresden Unit 3 will be little short of catastrophic.

Commonwealth Edison Company serves Northern Illinois, including Chicago. Its service area has a population of over 7 million and includes some of the country's most important industrial facilities. It contains the City of Chicago and the densely populated metropolitan area around it. The adequacy of power supply for this population and production center is critical to the nation's welfare. Commonwealth Edison Company's ability to meet the power needs of the area would be crippled by suspending the operation of Dresden Unit 3. The Company's system already suffers from a serious backlog of deferred maintenance and, even with Dresden Unit 3 operating, reserves are critically short.

Dresden Unit 3 cannot be considered in isolation. It is but one part of Commonwealth Edison Company's nuclear program, one of the largest in the country. That program includes not only Dresden Unit 3, but Quad Cities Units 1 and 2 and Zion Unit 1, all originally expected to be in service in the summer of 1972. The availability of the Quad Cities units is uncertain because of the promulgation of Revised Appendix D, although a request for authority to test and operate these units is pending before the Commission. Zion Unit 1's availability is doubtful due both to Revised Appendix D and construction delays which will probably prevent commercial service before the latter part of the summer of 1972.

Without these three units, the Company's reserve for the summer of 1972 will be only 669 megawatts, or 5.4%, about 1,000 megawatts short of the Company's normal target of about 14% and about 1,800 megawatts short of the 20% reserve margin recommended by the FPC. If Dresden Unit 3 is unavailable, the Company will have insufficient capacity to meet its projected 1972 summer loads, even if every piece of generating equipment on the system is working to perfection. In fact, at the time of Commonwealth's 1970 and 1971 summer peaks, outages and limitations reduced generating capability by 1,664 and 2,239 megawatts, respectively.

Moreover, the above data assume that, before the 1972 summer peak, the Company will be able to complete and put into service Powerton Unit 5, a fossil-fired unit now under construction, and meet all maintenance requirements. Without permission to operate the Quad Cities units, the Company will fall about one-third short of meeting its maintenance requirements, so that many units will not be able to perform satisfactorily next summer. If, in addition, the operation of Dresden Unit 3 were suspended, the Company would be unable to do any but the most pressing emergency repairs. The backlog of deferred maintenance, with its threat to reliability, would rise, and the amount of capacity available to serve the public would be further diminished.

In short, making Dresden 3 unavailable will almost certainly cause rationing of electric power in Northern Illinois and create a constant threat of blackouts.

The Company's own resources will be used, as available, to provide replacement energy if Dresden Unit 3 is not in service. To the extent that these resources are so used, the principal effect will be increased coal combustion (principally coal with a sulfur content averaging about 3½%) in old, inefficient units, often with inadequate precipitators. The Company cannot replace capacity deficiencies except by buying such capacity elsewhere. But construction delays and the impact of Revised Appendix D are not confined to Commonwealth Edison Company. The Company sees no prospect of significant additional supplies of firm power to meet its peak load and deferred maintenance requirements. Even assuming that the Dresden Unit 3 power can be replaced, the net cost of replacement will be approximately $600,000 a week in increased fuel costs and capacity charges, without considering carrying charges on idle resources. This expenditure will not, of course, be made if power is not available, but in that event the Company's service area would simply not have the electricity it requires, with consequences of the utmost seriousness to the health and welfare of Northern Illinois.

Attached to this letter as Annex C is detailed data on the power supply situation.

For the reasons above set forth, it is clear that the public interest urgently requires the continued operation of Commonwealth Edison Company's Dresden Unit 3.

Very truly yours,

Byron Lee, Jr.

Byron Lee, Jr.
Assistant to the President

Enclosures

Subscribed and sworn to
this 18th day of October, 1971.

Patricia A. Nelson
Notary Public

ANNEX A

Certain Radiological Data Regarding Dresden Unit 3

Radioactivity in Airborne Effluents

Dresden Unit 3 recently achieved a power output of approximately 100% of rated. At this level, the gaseous discharge was approximately 5000 microcuries/sec. If the unit remains at this level for the balance of the year, the annual dose attributable to Unit 3 at the site boundary would be less than 1% of the 10 CFR 20 limits and, therefore, less than 5 millirems at the site boundary, the station objective in Appendix I to 10 CFR 50 which is to apply only after existing units have had an opportunity to backfit. Even assuming that the fuel performance deteriorates, it is expected that the annual average release rate from Dresden Unit 3 during the period of NEPA review will not exceed 25,000 microcuries/sec. This release rate is approximately 4% of the annual average limit based on the 10 CFR 20 requirements. The resulting calculated dose would be less than 20 millirems per year at the site boundary without any allowance for the effects of shielding and occupancy. It should be pointed out that the above doses apply at a theoretical point at the site boundary and that the majority of the population surrounding Dresden Unit 3 is at a much greater distance than the site boundary. With shielding and occupancy factors, the annual dose is less than the variation in natural background and should have no adverse environmental effect.

Plans have been developed to modify the gaseous radwaste system of Dresden Unit 3. This modification incorporates the use of a catalytic recombiner and eight charcoal beds to reduce even further the emissions from Dresden Unit 3 and to provide assurance that long range exposures will be within the proposed Appendix I. This system is scheduled to be installed and operational by January, 1974. A submittal to the AEC describing this system has been made in a letter dated June 1, 1971.

Radioactivity in Liquid Effluents

The maximum possible whole body exposures from the release of radioactivity in liquid effluents at Dresden Unit 3 are expected to be even smaller than the possible exposures from radioactivity in airborne effluents. Considering the mixing which occurs in the Illinois River, with a flow of 5500 cubic feet per second, the maximum possible whole body dose to a person taking all of his drinking water from the Illinois River downstream of Dresden would be about 0.4 millirems per year, from the emissions of the combined Dresden 2 and 3 radwaste discharge, assuming design basis fuel leakage.

Accordingly, the exposure from the operation of Dresden Unit 3 alone would not be more than 0.2 millirems per year. Several other factors reduce this low number still further. These computations assumed much less favorable fuel performance than Dresden Unit 3 is experiencing to date. Additionally, it should be pointed out that the only known use of River water for drinking downstream of the Dresden site is for supply to the City of Peoria, which is 97 river miles away. Thus, for the people at Peoria, the dose would be considerably less due to decay.

With resulting doses this low, the small amounts of radioactivity discharged in liquid effluents cannot be considered to have a significant adverse impact.

ANNEX B

CERTAIN WATER QUALITY DATA

Dresden Unit 3

Thermal Effects

The original design of the cooling water discharge facility for Dresden Unit 3 called for a once-through system which would meet the then standard of 95° F maximum stream temperature for the Illinois River. Subsequent changes in the standard resulted in the installation of a 1,275 acre cooling lake and a spray system designed to limit stream temperature to 93° F, with temperature rises of not more than 5° F cumulative above the natural (or intake) temperature.

With the cooling lake and spray system, the discharged water is expected to comply with the maximum temperature standard during the hottest period of the summer. Assuming a river temperature of 88° F, a full flow of one million GPM, and a 23° F temperature rise, the cooling effect of the lake and the sprays will reduce the temperature at the point of discharge to 92.8° F. This will be in compliance with the 93° F limit and the 5° F maximum increase. The regulations specify a 600-foot mixing zone downstream from the discharge within which temperature limits need not be met. A further margin is provided by a decline of about 2° F in the mixing zone. There will, however, be days in other portions of the year when the discharged water will not mix quickly enough to meet the 5° limit within 600 feet. For example, on some cool summer days, the temperature rise may range as high as 9° F at discharge and 7° at the edge of the mixing zone. During some winter days, with spray efficiencies reduced, discharge water may be 12° F or more warmer than the river temperature, but, of course, far below the 93° F maximum limit. An application for a variance to cover these departures from the standard is pending before the Illinois Pollution Control Board.

It must be remembered that the receiving stream, the Illinois River, carries the full burden of the sewage effluent of the city of Chicago and its immediate environs. While the Metropolitan Sanitary District applies primary and secondary sewage treatment to these wastes under normal conditions, the effluent represents the same bacterial and other pollutant loading as that of the raw sewage discharge of a community of 800,000 population. All of this is discharged to the Sanitary and Ship Canal, which eventually becomes a part of the Illinois River. Other communities outside the Sanitary District also discharge municipal and industrial wastes to the Canal above Lockport, where it flows into the Des Plaines River. The Des Plaines also bears a burden of sewage and industrial wastes in the course of its flow through the suburbs located north, west and southwest of Chicago. From Lockport to the Dresden site, the waterway receives the full sewage of the large city of Joliet and the wastes from nearly two dozen sizable industrial water users, including the Joliet Arsenal.

Just northeast of the Dresden site, the DuPage River joins the Des Plaines. While considerably smaller than the Des Plaines, the DuPage is also heavily polluted, having received sewage input from a number of smaller communities west and southwest of Chicago.

The Kankakee River, a relatively clean body of water, joins the enlarged Des Plaines at the Dresden site. Despite the diluting effects of the Kankakee, the resulting watercourse, the Illinois River, is badly polluted at the point of the Dresden intake and discharge. It is incapable of supporting a complete or wholesome aquatic population. There is a meager number of scavenger and forage fish, the highest form of life supported by the river at that point, but they are not useful as game or food fish. The coliform count is too high to permit body contact. Given these conditions, which cannot markedly improve for many years, the discharge of cooling water as described from Dresden Unit 3 is most unlikely to cause any water quality degradation or damage to the sub-normal aquatic ecosystem of the river during the period of NEPA review.

Chemical Wastes

Dresden Unit 3 also discharges small amounts of ordinary chemicals into the waterway, primarily originating from the chlorination of the condenser water and regeneration of demineralizers. The amounts of these discharges are regulated by the State of Illinois Pollution Control Board. The discharges comply with established standards and will continue to do so during the review period.

ANNEX C

Load and Capacity Status of Commonwealth Edison Company's System

Commonwealth Edison Company's estimated peak load for the summer of 1972, including firm sales to other utilities, is 12,520 megawatts. Excluding all four nuclear units expected to be available for service at the time of the summer peak in 1972, but now affected by the provisions of Revised Appendix D,*/ the Company's aggregate capacity for the summer of 1972, including firm purchases from other utilities, would be only 12,400 megawatts. Thus, without these four units, even if every other kilowatt of capacity the Company owns were available for service at the time of the peak, the Company would be unable to meet all of the electrical demands upon it. But, of course, the actual deficiency in capacity would be far larger than the 120 megawatt shortage indicated above. This is because the system would have no reserve capacity. Taking into account the need for reserve capacity at the 14% level usually planned by the Company, the deficit would be over 1,800 megawatts.

Need for Reserve Capacity

Reserve capacity is required on a power system to assure reliable service to customers for various contingencies. The principal problem is the unavailability of generating capacity due to equipment failures. Exhibit A shows the experience for the months of July and August, 1971, and indicates the high degree of unavailability that can exist due to various types of troubles on the generating units. These data show that over 3,000 mw of

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*/ The four units are Dresden #3 (809 mw), Quad Cities #1 and #2 (Edison capacity entitlement - 1,214 mw), and Zion #1 (1,050 mw for 1972).

capacity was unavailable more than 50% of the days. One of the most common types of troubles is failure of boiler tubes which results in water leakage within the boiler. This requires shutdown of the unit for two or three days for repair. Failure of turbine blades has been a major source of trouble in recent years, requiring long outages for replacements.

Another contingency is that loads can be higher than the estimate. The peak load estimates are based on a 50% confidence level; that is, they assume average summer weather conditions. Because of the large portion of temperature sensitive load that now exists on the Commonwealth Edison system, the peak load experienced is greatly dependent upon weather conditions. It is possible for peak loads to exceed the estimate by several hundred megawatts during severe heat waves.

Alternative Sources of Power

One possibility for covering the shortages of capacity to supply the peak loads would be to purchase power from neighboring systems. Because of the large deficiencies that would exist and considering delays in nuclear units being installed by other systems in the Midwest, adequate firm capacity to cover our requirements would not be available. Emergency power has allowed the Company to meet its peak loads in the last several years. However, emergency power, in the huge amounts required, is not likely to be available in 1972, due to continuing construction delays, the delays in the Point Beach and Palisades nuclear units and restrictions which regulatory bodies have imposed on fossil units to lessen air pollution.

It will not be possible to obtain additional capacity for the summer of 1972 by installing other types of generating equipment. The lead time for gas turbines, the capacity most quickly installed, is from 12 to 18 months. Therefore, this type of capacity cannot be installed to meet the 1972 peak load.

The situation is so critical that simply permitting continued operation of Dresden 3 will still leave electric service in Northern Illinois in a crisis situation. Indeed, the Federal Power Commission, in comments on the desirability of licensing Quad Cities #1 and #2 which assumed the availability of Dresden #3, said:

> "While the amount of reserve capacity which individual systems consider necessary varies from system to system, a reserve of about 20 percent is generally regarded as sufficient for most moderately sized systems...In the case of the Quad Cities Nuclear Units, however, the imminence of a potential bulk power supply crisis in 1971 and 1972 rule out all alternatives in our opinion even the importation of power, which must be considered as impractical because of the lack of excess reserves in any of the areas within economical transmission distance from the systems of the Applicants." (Appendix G to Atomic Energy Commission Detailed Environmental Statement as to Quad Cities.)

Consequences of Inadequate Capacity

With inadequate capacity to meet its peak loads, the Company will be forced to adopt means of curtailing service. Perhaps 250 megawatts could be saved by a 5 percent voltage reduction. Other reductions might be achieved, given adequate notice of an emergency, through voluntary load reductions. But after such measures have been taken, load can be curtailed only by interrupting the supply of electricity, and in a sudden or severe emergency, very drastic steps would be necessary. A reduction of only 114 megawatts in one division of the Commonwealth Edison service area under these circumstances would involve the disconnection of about four square miles of Chicago. This area contains schools, hospitals, a police radio station, a metropolitan transit substation and numerous manufacturing companies and stores. To meet a 1,000 megawatt deficit, similar actions would have to be taken in each of the Company's seven divisions. While hospitals maintain emergency generators for their most critical work, the broad effects of such blackouts are apparent.

Maintenance Requirements

In addition to the problem of meeting peak loads, unavailability of Dresden #3 and Quad Cities would have a serious effect on the maintenance schedule now planned for the period October, 1971 through June, 1972. It has been estimated that to complete the work necessary on existing units would require approximately 100,000 megawatt-weeks of outage of capacity now in service. This amounts to about 20 percent of system capacity. If both Dresden #3 and the Quad Cities units are available through this winter and spring, the surplus capacity that would exist during this off-peak period would provide enough capacity to cover the required maintenance work. However, if the Quad Cities units are not placed in service during this period and Dresden #3 is not permitted to operate, the megawatt-weeks available for overhauling would be less than 45,000. This would mean that vital maintenance could not be done. Exhibit B describes some typical effects of postponing maintenance of major generating units. For example, delaying work on Waukegan Unit #7, which is a coal-fired unit of 338 mw, resulted in a four-week outage being stretched into a total of twelve weeks.

Exhibit A shows the outage experience for July and August, 1965, a period when the Company's generating equipment was in good condition,and the outage experience during last summer, when the system clearly showed effects of deferred maintenance resulting from delays in new unit service dates. The difference between the 1971 and 1965 curves can be shown to be caused to a large degree by deferred maintenance. The 1971 curve indicates the very large reductions in available capacity likely to result from the further postponement of needed maintenance which would be forced by the unavailability of Dresden #3 and the Quad Cities units. The critical capacity deficiencies at the time of the summer peak would be greatly exacerbated and there would be unavoidable curtailments of the supply of electricity to the public on a routine basis, with incalculable social and economic consequences.

EXHIBIT A

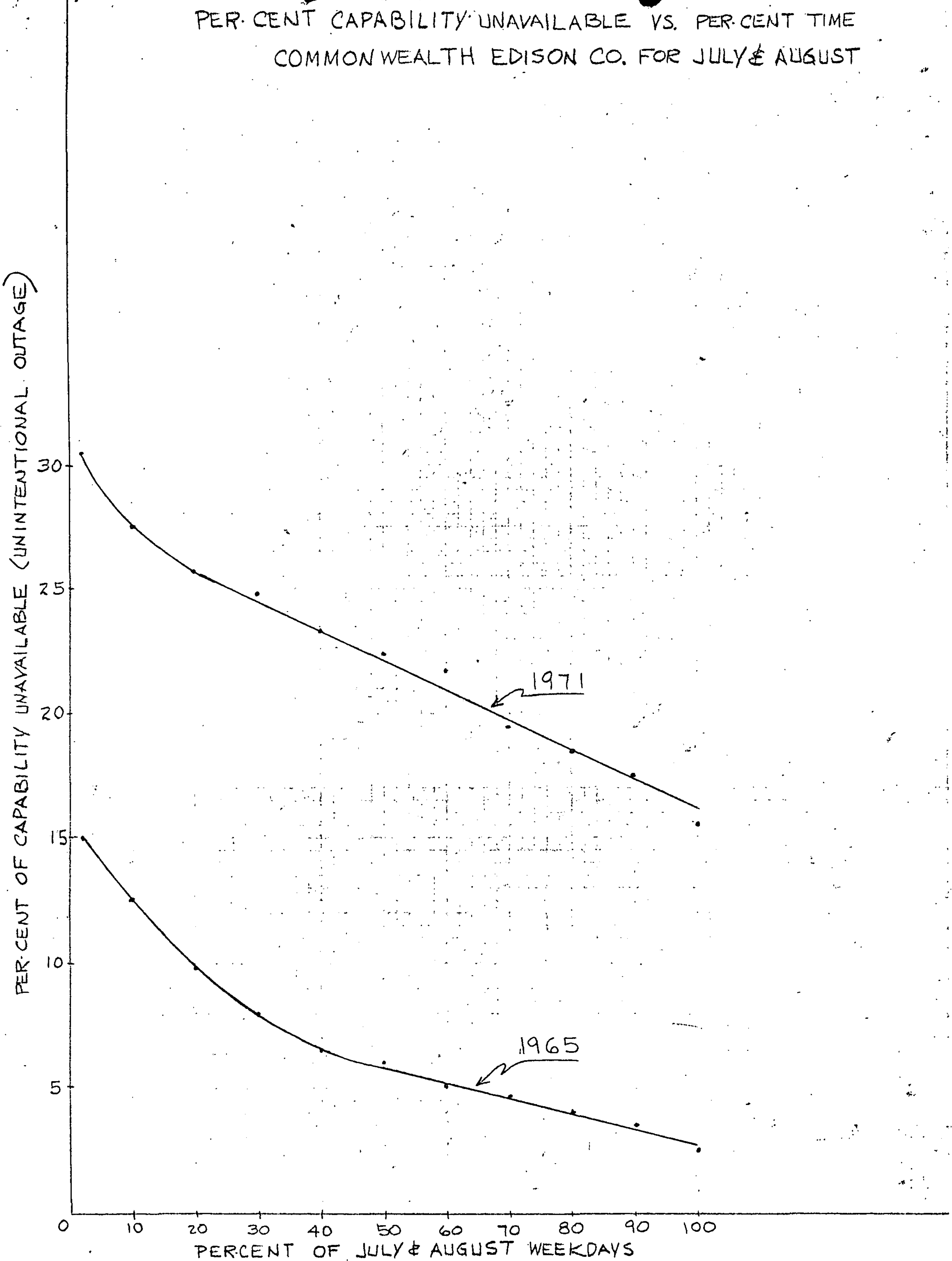
PER-CENT CAPABILITY UNAVAILABLE VS. PER-CENT TIME
COMMONWEALTH EDISON CO. FOR JULY & AUGUST
PER-CENT OF CAPABILITY UNAVAILABLE (UNINTENTIONAL OUTAGE)
30
25
20
15
10
5
0
1971
1965
10
20
30
40
50
60
70
80
90
100
PERCENT OF JULY & AUGUST WEEKDAYS

EXHIBIT B

Extra Maintenance Caused by Delayed Outages

This is an area where it is often hard to determine how much extra work has been caused by a necessary delay in the maintenance of a major piece of equipment. However, in some cases, there is no doubt.

A case in point is Waukegan Unit No. 7. This unit was requested in the spring of 1970 to replace the first stage. It was delayed six months, and a week before the outage was scheduled, the turbine failed. Instead of a four week outage, it was eight weeks and this only for a repair job. Another four week outage will be required to install the new nozzle block. The extra work and parts included in the G.E. bill are estimated at $250,000.

In 1968 the management of Crawford asked for a generator inspection of the unit 8. It had to be delayed and in December of 1969 there was a coil failure causing a three week emergency outage for repair.

Waukegen Unit 6 was overhauled in 1964. Using the standard five-year yardstick, the turbine should have been inspected in 1969. Instead, it was opened in the late spring of 1971. Extensive cracking in the intermediate pressure spindle caused a four week extension of the outage and a need to machine the spindle in such a way as to permanently lose a row of blades. A failure here could have been very serious.

Boiler leaks are a continuous source of downtime which is expensive and inconvenient. In 1970 there were 108 cases of major equipment outages caused by boiler leaks. In many cases these follow a pattern that a timely overhaul would have prevented.