REVIEW AND EVALUATION
OF A PROPOSED POWER COST ADJUSTMENT
FOR THE LINCOLN ELECTRIC SYSTEM

prepared for

THE LINCOLN ELECTRIC SYSTEM

LINCOLN, NEBRASKA

by

J. W. WILSON & ASSOCIATES, INC.

in behalf of

THE NATIONAL REGULATORY RESEARCH INSTITUTE
2130 Neil Avenue
Columbus, Ohio 43210

JUNE 1979

FOREWORD

This report was prepared by J. W. Wilson & Associates, Inc. for The National Regulatory Research Institute (NRRI) under Contract No. EC-77-C-01-8683 with the U. S. Department of Energy (DOE), Economic Regulatory Administration, Division of Regulatory Assistance. The opinions expressed herein are solely those of the contractor and do not reflect the opinions nor the policies of either the NRRI or DOE.

The NRRI is making this report available to those concerned with state utility regulatory issues since the subject matter presented here is believed to be of timely interest to regulatory agencies and to others concerned with utilities regulation.

The NRRI appreciates the cooperation of the Lincoln Electric System with the contractor in preparing this study and for their permission to make this information available to others interested in regulatory affairs.

Douglas N. Jones
Director

PREFACE

This report was prepared by J. W. Wilson & Associates, Inc. under contract with The National Regulatory Research Institute (NRRI). The findings contained in the report reflect the views of the consultant, and does not necessarily imply an endorsement by NRRI, or by the Lincoln Electric System (LES) about whom this report is prepared.

In February of 1978, the National Regulatory Research Institute established a Regulatory Assistance Program designed to offer technical assistance to state regulatory authorities and municipally owned utility systems in areas where outside expertise was required. The Lincoln Electric System applied for assistance under this program to investigate the power cost adjustment clause currently proposed by the LES. In response to this application, NRRI provided funds for this project and selected J. W. Wilson & Associates, Inc. (JWWA) to perform this analysis.

The three specific tasks included in the work plan have guided the activities of J. W. Wilson & Associates, Inc. under this project:

1. To perform a thorough and complete review of the Lincoln Electric System's proposed power cost adjustment clause;

2. To conduct a working meeting with LES Power Supply Division Staff concerning the proposed power cost adjustment clause; and

3. To prepare a report to the Lincoln Electric System assessing the proposed power adjustment clause and setting forth those considerations which may serve to improve its implementation and operation.

The evaluation of Lincoln Electric System's proposal was conducted by reviewing the documentation prepared by the Power Supply Division's Staff which track the power costs and the adjustment that would have been applied had the clause been in effect. In addition, the annual cost analysis summaries for 1978 and 1979 were reviewed, as were actual revenue recovery and cost data for 1978.

On February 6 and 7, JWWA and Mr. Steve Allison of NRRI met with Mr. Phil Euler and other staff of the Power Supply Division in order to discuss LES's proposed clause and to develop a work plan for the project.

On March 20, JWWA met with Mr. Phil Euler of the Power Supply Division to discuss preliminary findings and initial recommendations.

The final report which contains the results of the review and evaluation, including recommendations for changes or for adoption of the present form, is contained in the following document.

TABLE OF CONTENTS

I. INTRODUCTION

The Lincoln Electric System (LES) management has formally proposed the adoption of a power cost adjustment (PCA) clause, applicable to all retail customer classes, to be made effective with the System's 1980 rates. The present form of the proposed PCA was initially described in December of 1977, as part of the annual cost and rate report to the Administrative Board. The purpose of the proposed clause has been stated as follows:

> A power cost adjustment is simply a mechanism that automatically recovers from or credits to the LES customers the incremental or decremental power costs as compared to the base cost used in the annual design of electric rates for the utility. A power cost adjustment is deemed necessary because it is impossible for LES to review electric rates each time the cost of fuel or purchased power changes from the base cost or predict when these changes will occur with certainty. 1/

In general, the proposed PCA provides that the difference between the rate base estimated power costs 2/ and updated estimated power costs 3/ adjusted to account for actual power costs, be applied equally to all retail customer bills on a per Kwh

---

1/ LES power supply division, Rate Schedules, Service Regulations and Cost Analysis Summary for 1978 (Lincoln: LES), p. 19.

2/ Rate base estimated power costs, as described below, are the annually projected power costs on which electric rates for the year are originally based.

3/ Power cost estimates are updated throughout the rate year. Under the proposed PCA clause, updated estimates would, in effect, replace original rate base estimates, in the formulation of monthly billings to customers.

basis. Furthermore, the PCA is restricted to an upward or downward adjustment of no more than 3.0 mills per Kwh in any one month.

At the present time, the rates charged to LES retail customers are set annually, on the basis of one-year forward projected usage and costs. These annual projections are referred to as rate base sales and costs. Because all forward-looking projections, by their very nature, necessarily embody some uncertainty at the time they are made, LES rates, which are based on projections, are likely to either over or under collect in relation to actual costs. For example, if actual usage is different from the usage projections or if actual unit costs are different from projected costs, LES is likely to realize revenues which differ from costs actually incurred.

Furthermore, about two-thirds of the System's total cost of providing electric service is attributable to purchased power expenses. Purchased power costs are determined (within contractual limits) by the sellers of energy and power and, therefore, are beyond the control of LES management. Particularly, inasmuch as one of the purchased power suppliers to to LES has a PCA clause of its own, LES may face costs which change, on a per unit basis, significantly during the time that rates based upon the original rate base cost estimates are in in effect.

Also, LES is presently participating, along with five other public power systems, in the 1,500 Mw Laramie River

Project. Through Fiscal Year 1981-82, LES is facing unprecedented construction costs; and most of the power supply construction is to be funded by the issuance of long term debt. For this reason, the debt service coverage achieved by the Electric System in the next few years is particularly critical to keeping financing costs as low as possible in the long run. To the extent that the rates do not recover the operating costs associated with providing electric service, the shortfall will reduce the revenues available for debt service coverage. In addition, significant fluctuations in operating costs will, if not compensated for in the rates, affect the stability of revenues available for coverage. As revenue predictability decreases, financial risk increases, which in turn would increase borrowing costs.

The combination of fluctuating costs in the short run; the large portion of total costs which are, for the most part, not controllable by LES management; the special need for conservative and predictable debt service coverage levels; and the fact that LES is a publicly owned system such that the ratepayers are also, in effect, equity owners of the enterprise all support the adoption of a power cost adjustment clause for LES at this time.

Traditionally, the two primary objections to fuel adjustment and power cost adjustment clauses in electric utility ratemaking have been (1) the possibility that the utility will realize

windfall profits and (2) that with the pass-through of costs without detailed scrutiny, there will be no adequate incentive for management to maintain and improve operating and cost efficiency.

The potential problem of windfall profits is greatest for investor-owned utilities. For public power systems like LES, which are owned by the customers for whom electric service is provided, the motivation and danger of excess profits is largely absent. For LES, the important return on capital consideration is the service of the system's revenue bonds. Interest and principal payments must be made according to a fixed schedule, and a margin above the annual debt service is required in order to ensure the continued availability of debt capital. Because LES is customer-owned, there are no stockholders who stand to benefit from excess returns. In fact, the only important caution with respect to the level of return is to assure that management does not attempt to elevate the System's borrowing profile to a level which unnecessarily increases the cost of electricity to customers. While we are not aware of any evidence that this has occurred with respect to LES, it is a matter which should properly be of concern only in the annual rate-setting process, and it should not affect the design or implementation of the System's PCA clause.

Much the same logic applies to the issue of incentives. The annual rate review process offers an opportunity for scrutiny of management's long term commitments, and thus provides

an opportunity for evaluation of the efficiency of LES management. Inasmuch as the trade-off between stockholders' profits and customers' bills is not a central consideration to LES, it is not reasonable to prohibit or limit adjustment clauses in the belief that by so doing, incentives for increased profits will encourage greater efficiency.

Finally, the 3.0 mill limit applicable to the proposed PCA provides protection against its improper use. In the event that there are major differences in actual and rate base estimated costs which necessitate a rate change in excess of 3.0 mills, LES management would be required to present the facts to the City Council and receive regulatory approval to implement the greater change.

On balance, the PCA clause presently proposed by LES management meets three significant objectives important to the System's customers:

1. The 3.0 mill limit to the PCA protects customers from extreme changes in input costs and retains the necessity of LES management to operate the system as efficiently as possible.

2. The presence of the PCA on customer bills will have the effect of reflecting appropriate price signals about the current costs associated with the consumption of electrical energy.

3. The adoption of a properly designed PCA will contribute to the adequacy and stability of debt service coverage, and communicate to the financial community that cost recovery will be more certain and stable.

The PCA designed and proposed by LES contains important positive features. It is designed in a manner consistent with the annual rate setting process in that there is an explicit provision for continual updates to the original rate base projected expenses. It is also a forward-looking rate form which allows for rate adjustment as more current information becomes available and as usage and cost projections become more accurate. In addition, any remaining difference between actual costs and estimated costs is fully accounted for by means of retrospective reconciling adjustments which are made as true costs become known. Furthermore, the LES PCA is to be applied equally to all retail customers, so there is no appearance of price discrimination. And, as discussed above, the 3.0 mill limit protects customers from dramatic cost swings, thus ensuring that major events which affect costs will be subject to the appropriate regulatory evaluation.

In addition to these conceptual attractions, the impact of the PCA has been tested on a practical demonstration basis by the LES staff through application to historical system data for the past year. Through this approach, the impact of the PCA upon customer bills and the System's financial results has been evaluated and found to be reasonable.

Two modifications to the presently proposed PCA clause are recommended:

1. There is a need for an accounting/information system developed under the present accounting system which would permit routine

monitoring and periodic auditing of power cost recoveries;

2. Power costs associated with own-generation covered by the PCA should be limited to fuel expenses.

The most important of these recommended modifications is the creation of an accounting information system which permits both continual monitoring and periodic auditing of the estimates and booked costs passed through to customers. The appropriate system would also recognize the recovery of costs, and therefore, could be used to ensure that there was no double-counting or other form of excess recovery or refund. The expiditious development of this capability is particularly critical at the present time due to the review and auditing requirements that have been mandated for automatic adjustment clauses under Section 115(e) of the Public Utilities Regulation Policies Act of 1978 (PURPA).* The capability for monitoring and for auditing

---

*(e) Automatic Adjustment Clauses -- (1) An automatic adjustment clause of an electric utility meets the requirements of this subsection if

(A) such clause is determined, not less often than every 4 years, by the State regulatory authority (with respect to an electric utility (in the case of a nonregulated electric utility for which it has ratemaking authority) or by the electric utility (in the case of a nonregulated electric utility), after an evidentiary hearing, to provide incentives for efficient use of resources (including incentives for economical purchase and use of fuel and electric energy) by such electric utility, and

(B) such clause is reviewed not less often than every 2 years, in the manner described in paragraph (2), by the State regulatory authority having ratemaking authority with respect to such utility (or by the electric utility in the case of a

[Footnote continued on following page]

should be provided simultaneously by means of modifications to LES's present accounting system. Such information retrieval capability would be useful for making cost recovery information available to the City Council and other interested parties on an "on request" or routine basis, and would also facilitate the response to customer inquiries.

The variable operating and maintenance expense presently included in the proposal is not likely to change substantially on a per unit basis during the rate year in the same manner as fuel costs or purchased power (e.g., beyond the bounds of management's control). Therefore, it is recommended that fuel expense be the only energy cost associated with self-generation to be included in the PCA.

[Footnote continued from previous page]

nonregulated electric utility), to insure the maximum economies in those operations and purchases which affect the rates to which such clause applies.

(2) In making a review under subparagraph (B) of paragraph (1) with respect to an electric utility, the reviewing authority shall eamine and, if appropriate, cause to be audited the practices of such electric utility relating to costs subject to an automatic adjustment clause, and shall require such reports as may be necessary to carry out such review (including a disclosure of any ownership or corporate relationship between such electric utility and the seller to such utility of fuel, electric energy, or other items).

(3) As used in this subsection and section 113(b), the term "automatic adjustment clause" means a provision of a rate schedule which provides for increases or decreases (or both), without prior hearing, in rates reflecting increases or decreases (or both) in costs inurred by an electric utility. Such term does not include an interim rate which takes effect subject to later determination of the appropriate amount of the rate.

II: INTERIM COST ADJUSTMENT PROCEDURES

Throughout the country, prices charged for electricity by publicly and privately owned electric utilities are regulated by municipal and state authorities. When an electric utility wants to raise (or even reduce) its prices, it must file a set of rate schedules, showing the new prices that it proposes to charge with its regulatory authority. These rate schedules are simply price lists, showing the rates and charges for electricity service, and also explaining any other terms and conditions under which electricity service is furnished by the utility. The proposed new rates requested by the utility do not go into effect until approved by the regulatory body, or as otherwise provided by law.

Before approving a utility's request for a rate increase, the regulatory authority generally institutes an investigation into the need for higher rates. This investigation involves the presentation of evidence by the utility supporting its need for the higher rates. In general, there are two principal issues to be decided in a general rate investigation: the rate level and the rate structure. The rate level is the amount of money that the utility must recover through its rates in order to cover the total costs of providing electricity service, including the cost of providing a return on the capital invested in the business. The rate structure issues concern the apportionment of cost responsibility to each of the various customer

classes; and also involve the question of how specific rate schedules for each customer class are defined.

The rates resulting from such a rate investigation are based upon the best known information available prior to the rate investigation, and the resulting rates generally remain in effect for at least a year. In recent times, electric utility costs have been changing rapidly and therefore cannot be adequately incorporated in advance into the rates which are set during the rate investigation. As a result, electric utilities are exposed to a lag between the costs they incur and the cost recovery, in that cost recovery occurs under cost conditions which differ from those used to determine the rates.

In an effort to reduce the lag associated with rate investigations and the fixed nature of charges to customers, attention has turned to the use of interim cost adjustment procedures for changing electric utility rates between complete general rate investigations. The purpose of these interim cost adjustment procedures is to permit prompt changes in electric utility rate levels, in accord with changes in some of the more volatile cost elements, without the necessity of a complete rate investigation.

How Interim Cost Adjustment Procedures Work

An interim electric utility cost adjustment is a procedure for raising or lowering electricity service rates in response to changes in some of the cost elements which make up a complete cost of service, without reference to changes in other parts of the cost of service. The interim cost adjustment procedure focuses only upon those cost elements that the regulatory authority has determined in advance require interim adjustments between general rate investigations. Once the selection of the cost elements which require interim adjustment has been made, the next step in the procedure is to calculate the dollar impact of changes that have occurred in selected costs since the last rate investigation was made. This total dollar amount, then, is converted to a per Kwh amount, and all of the rates are adjusted upward or downward by this amount. Interim adjustment procedures have frequently been used or considered in the case of fuel, purchased power, labor, and property tax expenses. These particular expenses have been prime candidates for adjustment procedures because (a) they comprise a large portion of the total cost of providing electric utility service, and (b) these expenses tend to be more volatile than other portions of the total cost of service.

Advantages and Disadvantages of Interim Cost Adjustment Procedures

Interim cost adjustment procedures offer one major advantage: because they are focused on only some of the various elements in the total cost of service for an electric utility, and because they do not involve consideration of rate structure design at all, they permit prompt and more frequent adjustment to electric utility rate levels, in response to changes in the costs on which they are focused, than is possible in complete rate investigations. In other words, the prime advantage to the use of interim cost adjustment procedures is that they provide a substantial contribution to the problem of reducing the lag between the incurrence of costs and cost recovery.

There are two potential disadvantages associated with interim cost adjustment procedures. First of all, interim cost adjustment procedures may be subject to abuse by the utilities to which they apply. A second potential disadvantage is that interim cost adjustment procedures may tend to weaken or distort the incentives of utility management to minimize cost of providing electricity service.

The interim cost adjustment procedures may be abused where they have been badly defined, yet still receive the regulatory approval necessary for their use. In such cases, a utility may be able to manipulate the transactions to which the interim cost adjustments apply, or simply misstate the facts, taking advantage of the absence of adequate control or scrutiny by the regulatory authority. With regard to the latter problem, the solution is

increased scrutiny by the regulatory authority. And, indeed, it is coming to be recognized that interim cost adjustment procedures are not a device for abdication of regulatory responsibility, as they may often have been in the past, but rather are a device enabling the regulatory authorities to focus their attention on those costs that are changing most rapidly and, therefore, are most in need of careful scrutiny.[1/] With regard to incentives, the proper response to badly designed interim cost adjustment procedures is improvement in design, not necessarily the elimination of interim adjustments altogether.

Each of these two disadvantages deserves concern in the event that a new interim cost adjustment procedure is being considered. However, the fact that the Lincoln Electric System is a customer owned utility, rather than a stockholder owned utility, tends to reduce the potential and incentive for these types of abuse. That is, there is little or no profit motivation for the utility to abuse the interim cost adjustment procedure for private gain. Because LES is publicly owned by its customers, excess profits would ultimately revert to them rather than accruing to the private benefit of a separate group of stockholders. From management's perspective, the only inherent attraction of high profits is that they may cause the realized debt service coverage to achieve a level above what it would be otherwise, and perhaps above what is

---

1/ See footnote on page 7.

necessary to maintain the electric utility's ability to service its outstanding debt and to increase the amount of debt outstanding. In other words, the only financial motivation that LES management could conceivably have for overcollecting under a power cost adjustment clause is to improve its credit rating above that which is necessary to maintain credit and to continue to attract capital.

The objective of elimination or distortion of incentives is also an important consideration. The usual argument concerning incentives, is that as costs increase without offsetting productivity gains, and there is no automatic adjustment to the rates, the erosion in earnings will be borne by the stockholders. Because management is concerned with the return earned by the stockholders of the Company, they will behave in such a way to minimize this erosion, and thus, the absence of automatic adjustment procedures tends to encourage management efficiency. Once again, this argument is not strictly applicable to Lincoln Electric System, because LES has no motivation to seek private stockholders' gain at the expense of consumers. It is, of course, true that the System's consumers will receive the benefits associated with improved productivity and efficiency in the face of increasing costs, and this objective should be encouraged. The point is that, unlike rates in the private sector where private gain may play a more direct motivational role, LES management is wholly responsible to broader public goals. Therefore, those aspects of price incentives which presume interplay with

private stockholder interests are likely to be less critical in the design of an automatic cost adjustment clause for a publicly owned entity. In the absence of adequate market incentives, a partial answer to the unique problem of managerial incentives under these circumstances may be to place special emphasis on regular performance evaluations through independently conducted management audits, and to establish appropriate management accountability and incentive procedures based on the results of such objective evaluations.

Because LES is a publicly owned system, those affected by productivity gains or cost increases without offsetting revenue recovery will be the customers of Lincoln Electric System itself. To the extent that cost increases are not reflected in the rates over the short term, and debt service coverage levels fall, the interest costs associated with Lincoln Electric System's borrowing will increase over time. The new effect of this increase is higher rates in the future than would be the case if interest rates remained low. This aspect is especially important to LES at this time because of large increases in borrowing needs as a result of the construction of the Laramie River Project.

III: THE POWER COST ADJUSTMENT (PCA), AS PRESENTLY PROPOSED BY THE LINCOLN ELECTRIC SYSTEM

In its currently proposed form, the significant features of the Lincoln Electric System PCA include the method of application, the computation method and the costs which are included in the adjustment provision. These are the important aspects of the PCA because they define the manner and extent to which the adjustment will affect both customer bills and the financial conditions under which the Lincoln Electric System borrows money to add generating capacity.

Application of the PCA

The power cost adjustment presently proposed by LES is designed to be applied equally to all retail customers, on a per Kwh basis. This means that all customers -- residential, commercial and industrial -- are treated exactly the same way with respect to the adjustment. The amount of the adjustment per Kwh would be computed for each month, as described below, and applied to each customer's bill on the basis of that customer's usage during the adjustment month.

A second significant feature of the application of the PCA is that a 3.0 mill limit has been imposed on the amount of the adjustment. The 3.0 mill limit is intended to control to some extent the fluctuations in unit costs to which customers

would be exposed. The effect of the 3.0 mill limit is to require the utility to avail itself of the normal regulatory process in the event of substantial cost changes rather than simply passing them through using the PCA process. That is, in the event that there are unusual cost differences or extraordinary circumstances that necessitate a larger adjustment to the rates than 3.0 mills per Kwh, in either an upward or downward direction, the utility could not automatically pass the change through in the adjustment clause, but instead would be required to appear before the City Council in order to receive authorization for a special rate change. Therefore, the 3.0 mill limit is intended to protect the customer against unexpected and large fluctuations in his bill, and insures that the City Council will retain control over any significant changes in charges for electricity.

While agreeing with the purpose of this concept insofar as cost increases are concerned, we believe that serious consideration should be given to removing the limit with respect to cost reductions or refunds for overcollections in previous months. Particularly since collections are based in part on forecasts which sometimes tend to be on the high side, (as shown in Appendix F of this report, there was a substantial unrefunded balance at year-end 1978), we see no reason why the 3.0 mill limit should preclude immediate rate reductions (as it did in September, 1978) equal to the full magnitude of cost reductions and/or overcollections in previous months.

A final significant feature of the application of the proposed PCA is the smoothing effect of spreading the adjustment between actual costs and expected costs over a three month period. The difference between the actual cost and the revenues collected is computed, and then is distributed over a three month period on the basis of expected sales. The impact of this computation procedure is to dampen the effect of the adjustment upon customer bills in any one month. For example, if power costs are fluctuating on a per unit basis, so that one month requires a very high positive adjustment and another month requires a high negative adjustment, smoothing these effects over three months reduces the total impact because the two effects offset one another. Therefore, the smoothing aspect of the PCA computation also protects the customer against the unpredictability of extreme fluctuations in his monthly bill for electricity service.

Computation of the PCA

The power cost adjustment for each month is comprised of three parts. Each of these parts serves a different function, and when combined, the final PCA amount provides for the excess or deficit in power cost recoveries to be collected from or returned to customers. The three parts of the PCA computation are as follows:

1. The difference between the initial rate base unit cost estimate, upon which the prevailing rates were set, and the most recent updated or budget unit cost estimate made later in the year;

2. an adjustment for the over or under collection in the PCA during the previous month resulting from the difference in estimated and actual Kwh sales; and

3. an adjustment between the estimated power costs, as reflected in the PCA as well as in the base rates, and the power costs actually incurred by LES.

The details of this calculation, shown in formula format, are included as Appendix A. Sample calculations are shown in Appendix B.

The first part of the computation, the portion of the PCA attributable to the difference between the initial rate base estimate and the updated estimate, takes into account the increased certainty about costs which occurs as the year progresses. In the early part of the rate year, the estimates of expected costs and usage are fairly current. However, as time passes and events change, and as more information becomes available after the time the original base rates were set, LES management is in a position to improve the estimates made for periods later in the year. Therefore, this portion of the PCA allows for LES to either recover its costs or refund any potential overcollections associated with updated forecasting information.

The second portion of the PCA is the monthly carry forward, which consists of an adjustment for the difference between expected and actual collections from the PCA for the previous month which results from the difference between expected and actual sales. The previous month's PCA was established by spreading the total dollar adjustment required over the expected sales volume. Therefore, to the extent that last month's actual sales volume exceeded or fell short of the forecast, there would have been either an over or an undercollection of the intended PCA amount. In effect, this portion of the adjustment permits LES to recover this month the revenues that the PCA was designed to collect last month but did not due to imperfect sales forecasts. This provision, therefore, keeps the PCA collections on a current basis with respect to actual sales.

The combination of these first two portions of the PCA -- the portion attributable to the difference between rate base and updated estimates, and the portion attributable to the monthly carry forward, have the effect of updating the rate charged for providing electricity service according to the most current estimate of expected costs and, on a one month lag basis, actual rather than estimated sales. Therefore, these two portions of the clause increase the probability that LES will recover costs which best match the most recent estimate of costs. In addition, they tend to reduce the magnitude

of the correction for actual unit costs in comparison to estimated unit costs, and therefore, reduce the fluctuations in PCA unit charges from month to month.

The third part of the clause reconciles actual expenses with projected expenses. This reconciliation is necessary in order to insure that (1) LES does recover sufficient revenues to equal its actual costs, and (2) the recovery is no more than necessary to compensate for the actual cost incurred by the utility. The reconciliation adjustment is done by comparing the actual costs and actual revenues with the updated cost estimates for the month which is two months prior to the current month. All of the power cost revenues collected in that month (including PCA revenues attributable to the difference between rate base and updated unit cost estimates) are taken into account as are all of the costs. The difference between the two amounts is the remaining dollar amount that must still be either recovered from or refunded to customers in order to achieve an exact revenue-cost balance. Inasmuch as the reconciliation adjustment may vary substantially in either an upward or downward direction, the adjustment amount is spread over the next three months rather than being fully reflected in the PCA immediately. Thus, for example, for the PCA computation in March, the reconciliation between actual costs and revenues in January is spread over expected sales for March, April and May. This spreading of the adjustment over three months has the effect of smoothing

the impact of the adjustment and therefore of decreasing the fluctuations in unit costs to which customers are exposed.

During the past year, the Power Supply Division of the Lincoln Electric System has maintained, on a demonstration basis, data about the level of PCA changes if the PCA were part of the current rates, and about the impact on collections of power costs. The PCA for each month of calendar year 1978 are shown in Appendix C. In these computations, it was assumed that the PCA became effective in January of 1978; therefore, there are no PCA adjustments prior to that period. In addition, the rate base unit costs and updated unit costs are the same for the early part of the year, so the PCA amounts for January and February are zero. In March, the difference between actual unit costs and rate base unit costs is taken into account in the PCA, and the result is a .16 mill/Kwh refund to customers. In April, there is a small carry-forward which takes into account the difference between estimated and experienced March sales, as applied to the March PCA. In addition, there is an adjustment for the difference in actual unit costs and estimated unit costs for February. Again, because the rate base unit cost estimate and the updated unit cost estimate are the same, there is no component A to the PCA. For the month of April, the PCA charged would have been 1.17 mills/Kwh. The estimated unit cost per Kwh for the month of April was 25.54 mills; at a PCA of 1.17 mills/Kwh, customers would have exper-

ienced a unit cost increase in the amount of 3.3 percent added to their bills. Similiarly, the remaining power cost adjustments for 1978 are shown on Appendix C; each of the components -- A, B and C -- are shown individually, carried to three decimal places and the total PCA has been rounded to two decimal places. As shown on page 3 of the appendix, the 3.0 mill limit is applied in September. During September of 1978, the PCA computation resulted in a refund to customers in the amount of 3.1 mills/Kwh. Because the refund was limited to 3.0 mills, the carry-forward to October is negative rather than positive. In other words, the 0.1 mill that was not applied to bills in September was carried through to October, and customers were refunded the amount in their October PCA.

Appendix D shows the difference between the rate base estimates, the updated estimates, and the actual unit power costs. The rate base estimate is the unit cost upon which rates are set, smoothed over the month in equal charges. The updated estimates reflect additional information, and the actual amount takes into account both the amount of energy and demand required to meet requirements and the effective unit costs of the energy.

During 1978, the difference between actual cost and sales and estimated cost and sales resulted in an overcollection of revenues in the amount of $817,778. This is shown on a monthly basis in Appendix E. In the absence of a PCA, the overcollection is retained by LES, unless there is a one-time refund to

the customers. However, the more distant the date of the refund and the date of the over collection, the less likely it is that those customers who overpaid will receive the appropriate refunds. Appendix F shows the affect of the proposed PCA relative to the overcollections. During calendar 1978, PCA refunds would have totaled $808,514. This amount is slightly different from the rate base collections, because of the rounding in both Kwh and mills/Kwh estimates. However, a comparison of the PCA refund amount with the overcollection resulting from application of the base rates makes it clear that the PCA, as proposed by LES, does track revenues with costs, and for 1978, allowed for a refund to be made to customers.

Furthermore, the design of the PCA is such that customers are protected from excessive fluctuations in their bills. The first part of the adjustment, which accounts for the difference between the initial cost estimate included in the base rate and the unit cost which reflects updated information, has the effect of minimizing the extent to which the reconciliation between actual and estimated costs will affect the PCA. In other words, inclusion of updated estimates, to the extent that the updated estimates are more accurate than the initial rate base cost estimates, will anticipate the difference in estimates and cost, and thus will spread the impact of the difference over a large number of periods.

Another part of the design of the clause which protects customers from excessive fluctuations is the 3.0 mill limit. The 3.0 mill limit provides an upper and lower bound for the PCA and thus insures that the unit charge which is applied to customer bills will be more or less the same every month. In fact, at an average rate base estimate of 32.77 mills, the 3.0 mill limit provides for a unit charge within a plus or minus 9 percent of the base rate.

A third part of the PCA design which tends to minimize the fluctuations shown on customer bills is the three month smoothing of the reconciliation between actual and estimated costs. For example, the July PCA contains a reconciliation of May collections and May costs which require a refund in the amount of $295,122. The August PCA, however, contains an under collection of June costs in the amount of $133,246. Because each of these reconciliation amounts are spread over the month of the clause and the two succeeding months, the August amount of the July refund will tend to offset, to some extent, the August calculation of the August under collection. Whenever the reconciliation amounts alternate in direction, the spreading effect will tend to dampen the impact upon the PCA.

The PCA amounts have been calculated for each of the months during calendar 1978. As shown in Appendix C, the highest PCA applied in any month would have occurred in May; the calculated PCA for the month of May was 2.43 mill/Kwh.

The highest negative PCA would have been applied during the month of September, when the 3.0 mill limit was used and a PCA of 3.0 mills was applied. Furthermore, for the ten months during which a PCA would have been in effect, the PCA would have raised the unit costs on customer bills during five of the ten months, and reduced the unit cost in the remaining five months. Therefore, the customer would see both upward and downward adjustments in their unit charges, and would not perceive the PCA as merely an increase in the unit cost of electric service.

Costs Included in the PCA

In the form presently proposed by LES, the power cost adjustment is designed to include the following power costs:

1. the total cost of purchased power from all sources;

2. the total variable production cost of LES's owned generation (operation and maintenance, and fuel); less

3. revenues from wholesale sales.

Each of these costs are estimated in the cost analysis on which rates are based and including a deduction for estimated wholesale revenues, is included in the filed rates applicable to electric customers. Therefore, the ultimate PCA revenues represent the difference between the initial rate base cost estimates and actual power costs incurred, net of actual wholesale revenues.

IV: RECOMMENDATIONS AND CONCLUSIONS

The power cost adjustment proposed by the Lincoln Electric System should be adopted and made part of the utility's tariff, with the modifications described below. This conclusion is based upon three findings of this analysis:

1. The PCA does what it is intended to do -- that is, it properly balances actual power costs and revenues over time;

2. the clause is designed in a manner that protects customers from excessive fluctuations in their bills resulting from cost changes; and

3. the demonstration data collected during the past year show that the financial impact upon customers is not unreasonable.

The most important support for adoption of the PCA is that the adjustment does precisely what it is supposed to do: the clause prevents LES from experiencing revenue erosion as a result of power cost changes, it provides stability and predictability to expected debt service coverage levels, and it returns revenues in excess of actual power costs to consumers. These results are especially important to the customer-owners of Lincoln Electric System right now and for the near future because of the size of additional borrowings anticipated for completion of the Laramie River Project.

LES's planned ownership in the 1,500 Mw Laramie River Project is 200 Mw, or slightly above thirteen percent. The total capital cost budget for Laramie River is $1.3 billion. During

the period beginning with fiscal year 1978-79 through fiscal year 1981-82, Lincoln Electric System plans to issue new debt in the amount of $154.7 million. Of this amount, $100.5 million, or 65 percent, is attributable to LES's proportional share of Laramie River. In other words, the construction of Laramie River necessitates new debt substantially larger than it is today.

In summary, the PCA presently proposed by the Lincoln Electric System is designed in a manner to accurately reflect the cost of power actually experienced by the utility as a result of customer use and demand, and also protects customers from extreme fluctuations in the unit charges applied to their bills, as well as produces PCA amounts which tend to fluctuate in both directions in small amounts. These factors, taken together with the present need for high borrowings and the accompanying need for stability and predictability in debt service coverage levels, strongly support the adoption of a PCA for the Lincoln Electric System at this time.

On the basis of a review of the PCA calculation method and results, two modifications are recommended:

1. There is a need for an accounting/information system, which would permit routine monitoring and periodic auditing of power cost recoveries; and

2. power costs associated with LES's own-generation facilities and covered by the PCA should be limited to fuel expenses only.

The need for modification to the present accounting and information system is paramount; with such a system, application of the PCA on an overall basis is feasible, and the capability for proper auditing and monitoring is improved. The expiditious development of this capability is particularly urgent at the present time due to the review and auditing requirements that have been mandated for automatic adjustment clauses under Section 115(e) of the Public Utilities Regulatory Act of 1978. Also, an interim cost adjustment clause added to customer bills is very likely, at least initially, to increase the number of customer inquiries about bills. LES must be able to answer the questions it receives from customers and from the City Council in an understandable and expeditious manner. Therefore, it is important that power cost adjustment information be readily available to both customer service employees and to the management personnel who are responsible to the Administrative Board and, in turn, to the City Council. Furthermore, the performance of the clause should be a subject for review during the annual rate setting process. And at that time, LES must be able to show the result of a formal audit which demonstrates the extent to which the base rates under or overcollected power costs and how application of the PCA offset such under or over collections. Furthermore, LES should keep information about the impact of the PCA on typical customer bills, much in the form that is currently followed in the monthly memos which

explain the calculation of the PCA and evaluate the reasons for its behaving as it does. Of course, the accounting system would necessarily be incorporated into the present accounting and billing system, and should have as a companion system a management information system which would allow Lincoln Electric System management to respond to inquiries from the City Council and other interested parties.

It is also recommended that the own-generation cost included in the PCA be limited to the cost of fuel. Fuel expense is a large portion of own-generation costs, and is an expense that is largely beyond the control of LES management. The other expenses associated with own-generation (supervisory, and operation and maintenance expense) are primarily dependent upon the number of employees and wage levels of LES personnel. Such costs are more likely to be fixed over the short run and thus can be estimated fairly easily, although differences in estimated and actual sales will, on a per unit basis, lead to fluctuations in these expenses. However, the operating costs associated with LES's own-generation capabilities at the present time are very high, and therefore, LES would always prefer to use purchased power as long as the unit costs (including the fixed cost associated with own-generation) of purchased power are lower than the unit cost of own-generation. Fuel expense, because it is not controllable by LES and because it may be

very different from that comtemplated in the rate base estimates, should be a part of the PCA. Therefore, it is recommended that the own-generation production costs included in the PCA be limited to fuel expense only.

APPENDIX A

LINCOLN ELECTRIC SYSTEM

Power Cost Adjustment Computation

$$\text{Power Cost Adjustment} = A + B + C$$

$$A = \frac{\text{Updated Estimate of Power Costs}}{\text{Updated Estimate of Retail Sales}} - \frac{\text{Rate Base Estimate of Power Costs}}{\text{Rate Base Estimate of Retail Costs}},$$

for the month to which the PCA is to be applied.

$$B = \frac{\text{Last month's updated estimate of retail sales} \times \text{Last month's calculated PCA*} - \text{Last month's actual retail sales} \times \text{Last month's actual PCA}}{\text{This month's updated estimate of retail sales}}$$

$$C = \frac{\text{Actual power costs, 2 months ago} - \text{Revenues recovered for power costs, 2 months ago}}{\text{Updated estimated retail sales, this month and the next two months;}} + \frac{\text{Dollar Adjustments from the two preceding months}}{\text{Updated Estimated Retail Sales}}$$

*The difference between the calculated PCA and the actual PCA is attributable to the 3.0 mill maximum PCA limitation.

APPENDIX B

LINCOLN ELECTRIC SYSTEM

Power Cost Adjustment
for the Month of December 1978

Rate Base Cost Estimate - December 1978	$2,228,563
Rate Base Sales Estimate - December 1978	109,522.4 Mwh
Updated Cost Estimate - December 1978	$2,258,100
Updated Sales Estimate - December 1978	109,633 Mwh
Actual Cost - October 1978	$1,939,559
Actual Sales - October 1978	107,999.4 Mwh
PCA Billed - October 1978	(1.30) mills/Kwh
Updated Sales Estimate - November 1978	102,106 Mwh
Actual Sales - November 1978	97,736.2 Mwh
PCA Billed - November 1978	(2.05) mills/Kwh
Updated Sales Estimate - January 1979	113,927 Mwh
Updated Sales Estimate - February 1979	108,698 Mwh
Reconcilliation Adjustment - October 1978 (August Actual)	($62,681)
Reconcilliation Adjustment - November 1978 (September Actual)	($48,464)

Source: PCA Calculation Forms, dated December 1978, January 1979 and February 1979

$$PCA = A + B + C$$

$$A = \frac{\$2,258,100}{109,633} - \frac{\$2,228,563}{109,522.4} = 20.597 - 20.348 = .249$$

$$B = \frac{(102,106 \times -2.05) - (97,736.2 \times -2.05)}{109,633} = (.082)$$

$$C = \frac{\$1,939,559 - (107,999.4 \times 21.52)}{109,633 + 113,927 + 108,698}$$

$$+ \frac{(-\$62,700) + (-\$84,506)}{109,633} = (2.171)$$

PCA = .249 - .082 - 2.171 = -2.004 = 2.00 mills/Kwh refund

Reconcilliation Adjustments to be Carried Forward:

To January 1979	($131,875)
To February 1979	($125,799)

LINCOLN ELECTRIC SYSTEM

Power Cost Data: Calendar 1978

	January	February	March	April
Rate Base Cost	$2,084,699	$1,898,927	$1,929,206	$2,432,133
Rate Base Sales - Mwh	111,131.9	104,911.4	97,553.0	95,211.9
Updated Cost	$2,084,699	$1,898,927	$1,929,206	$2,432,133
Updated Sales - Mwh	111,131.9	104,911.4	97,553.0	95,211.9
Actual Cost	$1,997,418	$2,512,109	$2,194,558	$2,618,092
Actual Sales - Mwh	108,978.3	116,786.4	103,069.2	92,283.4
PCA:				
A	-0-	-0-	-0-	-0-
B	-0-	-0-	-0-	.009
C	-0-	-0-	(.162)	1.163
Total - Mills/Kwh	-0-	-0-	(.16)	1.17

LINCOLN ELECTRIC SYSTEM

Power Cost Data: Calendar 1978

	May	June	July	August
Rate Base Cost	$2,603,551	$2,954,601	$3,589,783	$3,396,908
Rate Base Sales - Mwh	97,256.1	116,269.9	146,074.8	158,908.2
Updated Cost	$2,677,000	$2,714,000	$3,497,000	$3,281,000
Updated Sales - Mwh	97,030.0	108,370.0	140,976.0	152,900.0
Actual Cost	$2,070,105	$2,637,489	$3,019,539	$2,724,593
Actual Sales - Mwh	85,727.7	100,009.7	139,271.6	135,527.0
PCA:				
A	.819	(.368)	.231	.081
B	.035	.258	.137	.009
C	1.613	2.424	.417	.299
Total - Mills/Kwh	2.47	2.31	.79	.39

LINCOLN ELECTRIC SYSTEM

Power Cost Data: Calendar 1978

	September	October	November	December
Rate Base Cost	$2,805,866	$2,308,602	$2,081,878	$2,228,563
Rate Base Sales - Mwh	135,802.0	108,350.3	101,949.8	109,522.4
Updated Cost	$2,653,900	$2,361,200	$2,108,300	$2,258,100
Updated Sales - Mwh	138,910.0	109,734.0	102,106.0	109,633.0
Actual Cost	$2,585,556	$1,939,559	$1,824,213	$2,207,573
Actual Sales - Mwh	142,830.7	107,999.4	97,736.2	107,593.4
PCA:				
A	(1.556)	.227	.227	.249
B	.049	(.019)	(.022)	(.082)
C	(1.593)	(1.483)	(2.256)	(2.171)
Total - Mills/Kwh	(3.0)*	(1.29)	(2.05)	(2.00)

*Calculated value is (3.10); limited by 3.0 mill constraint.

Source: PCA Calculation Forms, December 1978, January 1979 and February 1979;

LINCOLN ELECTRIC SYSTEM

Estimated and Actual
Unit Power Costs: 1978
(mills/Kwh)

	Rate Base Estimate	Updated Estimate	Actual
January	18.76	18.76	18.33
February	18.10	18.10	21.51
March	19.78	19.78	21.29
April	25.54	25.54	28.37
May	26.77	27.59	24.15
June	25.41	25.04	26.37
July	24.58	24.81	21.68
August	21.38	21.46	20.10
September	20.66	19.11	18.10
October	21.31	21.52	17.96
November	20.42	20.65	18.67
December	20.35	20.60	20.52
Average	21.92	21.85	21.18

LINCOLN ELECTRIC SYSTEM

Power Cost Collections - Without PCA
Calendar 1978

	Actual Cost	Rate Base Cost	Rate Base Sales (Mwh)	Actual Sales (Mwh)	Actual Collection	Difference
January	$1,997,418	$2,084,669	111,131.9	108,978.3	$2,044,433	$ 47,015
February	2,512,109	1,898,927	104,911.4	116,786.4	2,113,838	(398,275)
March	2,194,558	1,929,206	97,553.0	103,069.2	2,038,709	(155,849)
April	2,618,092	2,432,133	95,211.9	92,283.4	2,356,918	(261,174)
May	2,070,105	2,603,551	97,256.1	85,727.7	2,294,931	224,826
June	2,637,489	2,954,601	116,269.9	100,009.7	2,541,246	(96,243)
July	3,019,539	3,589,789	146,074.8	139,271.6	3,423,296	403,757
August	2,724,593	3,396,908	158,908.2	135,527.0	2,897,567	172,974
September	2,585,556	2,805,866	135,802.0	142,830.7	2,950,882	365,326
October	1,939,559	2,308,602	108,350.3	107,999.4	2,301,467	361,908
November	1,824,213	2,081,878	101,941.8	97,736.2	1,995,773	171,560
December	2,207,573	2,228,563	109,522.4	107,593.4	2,189,526	(18,047)
Cumulative						$817,778

LINCOLN ELECTRIC SYSTEM

PCA Collection: Calendar 1978

	PCA (Mills/Kwh)	Sales (Mwh)	PCA Collection (Refund)	Rate Base Collection Over (Under)
January		108,978.3		$ 47,015
February		116,786.4		(398,275)
March	(.16)	103,069.2	($16,491)	(155,275)
April	1.17	92,283.4	107,972	(261,174)
May	2.47	85,727.7	211,747	224,826
June	2.31	100,009.7	231,022	(96,243)
July	.79	139,271.6	110,025	403,757
August	.39	135,527.0	52,856	172,974
September	(3.00)	142,830.7	(428,492)	365,326
October	(1.29)	107,999.4	(139,319)	361,908
November	(2.05)	97,736.2	(200,359)	171,560
December	(2.00)	107,593.4	(215,187)	(18,047)
1979	N.A.		(537,812)*	
Total Collected (Refunded)			($824,038)	$817,778

*Remaining balance of overcollections at 12/31/78 to be carried forward and refunded in 1979 in accordance with the 3.0 mill limit.