

FIRM PRICE BIDDING AT METROPOLITAN EDISON COMPANY¹

by James R. Shriver

Abstract. The Metropolitan Edison Company chose to try lump sum bidding of circuits or jobs as an alternative to time and material contracting. This firm price bidding method has successfully reduced the cost per mile of contracted line clearance work. The six-year development of this procurement system is highlighted, along with key features of the bidding and award procedures and specifications currently in use.

Résumé. La "Metropolitan Edison Company" a choisi d'essayer l'octroi de contrats forfaitaires globaux pour un circuit électrique ou un travail comme alternative aux contrats à prix unitaire (horaire). Ce type de contrats forfaitaires a réduit le coût par mille des travaux de dégagement des réseaux. Les six ans de développement de ce système est présenté, de même que les éléments-clés des procédures d'appel d'offres et d'octroi de contrats et des normes requises.

The Metropolitan Edison Company (Met-Ed) began experimenting with firm price (FP) bidding of distribution line clearance work in 1981. This work was traditionally purchased through time and material contracts (T&M) with several different contractors. Competitive bids were solicited annually and awards were made to four or five contractors for various numbers of crews. The award process was flexible and worked well. Although Met-Ed was not dissatisfied with this system, there was a growing interest in alternatives during 1980. Several electric utilities had reported successful FP bidding of line clearance work. Met-Ed decided to begin a small scale trial in 1981 in order to gain first-hand experience with FP bidding.

The actual design of this trial was preceded by an exchange of ideas and concepts between Met-Ed Forestry and Purchasing personnel. Each group harbored legitimate concerns about the decision to try FP bidding. After several meetings, the goal of this trial and several design guidelines were established.

Goal of the FP Trial

Several actual FP procurements would be made

in order to measure the cost efficiency of FP bidding for the purchase of line clearance versus that of T&M procurements. The FP trial design guidelines were as follows:

1. Modification of trial FP bid procedures specifications, etc. should be made as needed to provide a fair comparison with T&M without sacrificing the quality of line clearance obtained.
2. The trial should be of sufficient duration to establish accurate projections of the long term cost efficiency of FP bidding.
3. The trial should not disrupt or displace the existing contractor work force any more than necessary to produce a fair comparison.
4. Lump sum bids for completion of a circuit or job should be utilized instead of FP bids per mile completed.
5. Contracts for each circuit/job should always be awarded to the lowest bidder unless the low bidder has submitted an exception of the bid request documents.
6. Competition for FP circuits/jobs would be critical to the procurement of reasonable bids. Initially the competition would be limited to the four established contractors and then expanded to include several additional contractors who had already expressed an interest in working for Met-Ed.
7. The design should include some mechanism to limit the amount of risk involved for each of the bidders. Lump sum bidding carried an increased amount of risk which would drive up the bid prices beyond those for firm price per mile bidding.

FP Trial Evaluation

In addition to these design guidelines, several stipulations were made regarding the evaluation of trial results.

¹Presented at the annual conference of the International Society of Arboriculture in Keystone, Colorado in August 1987.

1. Evaluations should compare the invoice cost per mile of work completed by T&M crews with the aggregate bid price cost per mile of FP work completed each year.
2. Evaluations of work quality should be limited to a judgement by Met-Ed foresters as to the quality of line clearance obtained in the field.
3. If no cost benefit was attributed to FP bidding after a fair trial period, the FP procurement system would be abandoned in favor of T&M contracts.
4. If there was a cost benefit attributed to FP bidding, the procurement system would be adopted and expanded to optimum levels for scheduled maintenance of distribution circuits. A small number of T&M crews would still be required for clearing on new construction and emergency work which are not feasible candidates for FP bidding.

These guidelines proved to be instrumental in the development and implementation of the first Met-Ed FP procurement system. The subsequent trial of FP bidding showed that the same quality of work could be produced under the new FP system. The cost efficiency of FP bidding also appeared to be better than T&M. Fig. 1 compares the T&M and FP costs per mile for each year from 1981 to 1986. Cost projections are shown for 1987.

In 1984, FP bidding was expanded in order to demonstrate the potential for cost savings on a

larger scale. Approximately 988 miles of line on 40 jobs were offered for bidding by eight qualified contractors (Fig. 2). The cost per mile was \$1057 per mile less than T&M costs that same year. The FP procurement system was deemed a success.

In 1985, Met-Ed expanded FP bidding to 70% of the total line clearance expenditures. In 1986 and 1987, 89% of scheduled expenditures were bid on a FP basis.

Firm price procurement costs have outperformed T&M costs each year except the first year 1981 and 1985. The first year bid prices were high because the bidders took a cautious approach to the new system. In 1985, the same caution returned because most contractors had experienced at least one unprofitable job. This caused FP bid prices to reach a six-year high point. At the same time, T&M costs dipped to a three-year low per mile. Time and material costs were \$92 per mile lower than FP in 1985. This slight cost advantage associated to T&M was not sustained in 1986 or 1987. Firm price costs per mile averaged \$256 less than T&M in 1986 and are projected to be \$300 less in 1987. This represents a savings of more than \$500,000 each year on approximately 2000 miles of work performed on FP contracts versus T&M contracts.

The quality of work has remained relatively uniform throughout trial and expansion of FP bidding at Met-Ed. The physical clearance obtained

MET-ED DISTRIBUTION TREE MAINTENANCE: COST PER MILE MAINTAINED; T&M VS. F.P.

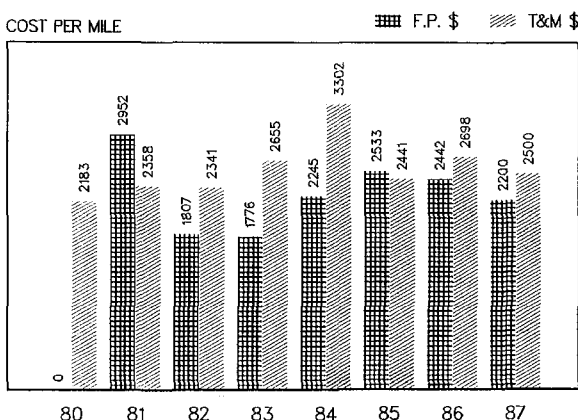


Fig. 1.

MET-ED DISTRIBUTION TREE MAINTENANCE: MILES OF LINE MAINTAINED; T&M + F.P.

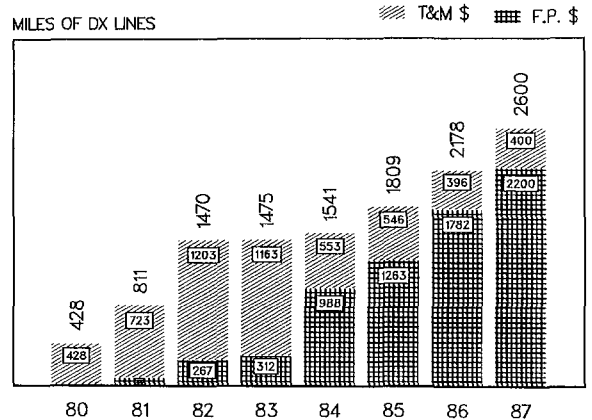


Fig. 2.

is consistent with Met-Ed expectations. Acceptance of the work by property owners and the public is similar to that experienced with T&M contracts. Met-Ed supervisory and administrative requirements for each mile of work completed are significantly less because the burden of maintaining production efficiency has been shifted to the contractor. Met-Ed has utilized the cost advantage of FP bidding to accomplish more line clearance work for the dollar spent. This has allowed more rapid progress toward achieving a 5-year maintenance cycle which subsequently reduced the effort and expense of retrimming. In 1986, the \$256 per mile cost advantage of FP provided a "bonus" of 186 miles of completed work. Collectively, these advantages have facilitated effective utilization of increasingly larger line clearance budgets, beginning with \$2 million in 1981 up to \$5.4 million in 1986. Fig. 3 shows the reduced man-hours and trees per mile maintained while Fig. 4 shows the rise in expenditures for line clearance.

FP Bidding Procedures

The Met-Ed FP bidding system includes several key components that have contributed to the success of this procurement method. Approximately 18 qualified line clearance contractors are invited to attend a pre-bid meeting in order to become eligible for bid invitations during the upcoming year. This meeting is held during August or September. Changes in the bidding procedure,

contract documents, and specifications are discussed. A sample contract is supplied to each company attending. The work is offered in three different "rounds" of bidding as follows:

- 1st Round - 40% - offered in August - bids due October
- 2nd Round - 40% - offered in October - bids due December
- 3rd Round - 20% - offered in January - bids due February

The first round bid meeting is normally scheduled in conjunction with the pre-bid meeting for the same day.

Each of the four operating divisions of Met-Ed supplies a list of jobs with circuit mileage estimates and line maps to the interested bidders. Each round contains 400 to 800 miles of work.

Approximately six weeks are needed to formulate bids. Each bidder is permitted to bid as many jobs in as many divisions as he chooses. Contractors who have not successfully completed a FP job on Met-Ed are limited to an award of one job only during their probationary status. The contractors are encouraged to submit bids for as many jobs as possible.

During bid evaluation, the successful (lowest) bids are identified and compared to the second lowest bids for each of the jobs offered. A successful bidder will be requested to verify the accuracy of a bid that is more than 25% below the next lowest bid. The bid may be withdrawn by the contractor or he may accept the job for the quoted

MET-ED DISTRIBUTION TREE MAINTENANCE:
MH PER MILE & TREES PER MILE MAINTAINED

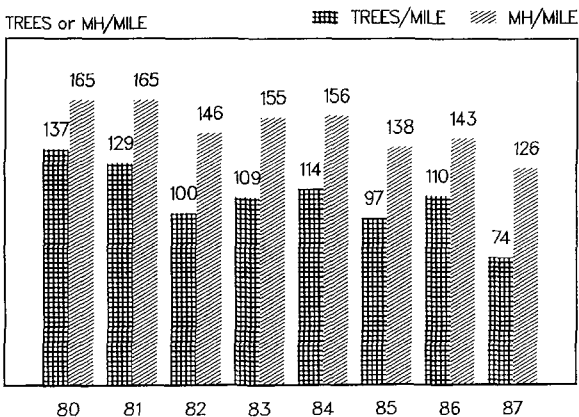


Fig. 3.

MET-ED DISTRIBUTION TREE MAINTENANCE:
COST OF WORK COMPLETED; T&M + F.P.

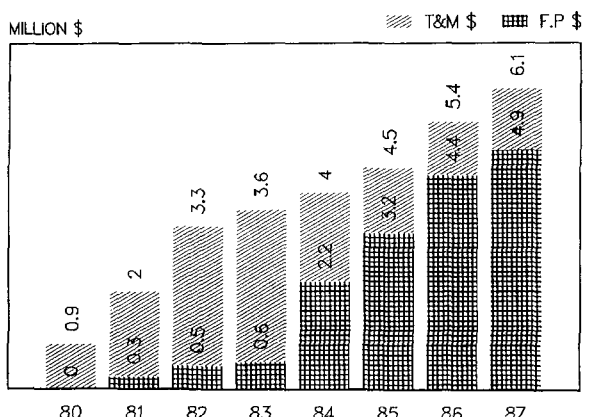


Fig. 4.

price. This protects the bidders from being forced to accept a job for a bid price that is erroneous. The bid verification can be performed by telephone at the time of award, since each job is awarded one at a time. The successful bidder may also withdraw a bid if he has already accepted a significant volume and has reached his capacity to complete the specified work on time. When a successful bidder opts to withdraw a bid for "capacity limiting" reasons, the job is awarded to the next lowest bidder. The contractor who withdrew acceptance due to capacity is no longer considered for awards for the remainder of that year. This encourages bidders to submit bids on an array of jobs without fear of being forced into an over-commitment of available resources. Both withdrawal options work well to limit risks for the contractors. The jobs must be awarded in a predetermined sequence, one at a time in order to provide this risk protection without divulging confidential bid price information. Each successful bidder must "take it or leave it" on a job by job award of the work.

Job lengths are usually five to 50 miles in length. Longer jobs present larger risks and therefore higher costs per mile. Jobs less than five miles in length are administrative burdens and are usually grouped with other short lines to make a larger single FP job. The average job length in 1986 was 21.7 miles (82 jobs/1782 miles) (Fig. 5).

MET-ED DISTRIBUTION TREE MAINTENANCE:
NUMBER OF FIRM PRICE DISTRIBUTION MAINTENANCE JOBS

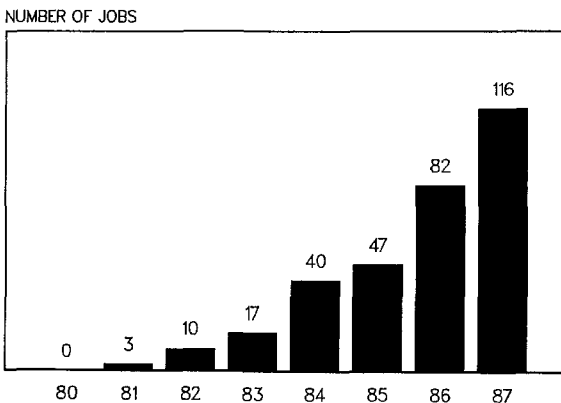


Fig. 5.

Specifications

The work specifications require a minimum of ten feet of clearance around primary conductors and three feet of clearance around secondary conductors. The contractor is also required to regain or improve the clearance obtained during the previous maintenance cycle. Property owners must be contacted in advance in order to obtain a courtesy acknowledgment (not permission) of each tree to be trimmed to produce these clearances and to obtain consent for tree removal, brush cutting, herbicide application, and injection of tree growth regulators wherever these alternatives are appropriate. Fast growing, tall trees species are required to be removed and or treated with herbicides where they cannot be professionally pruned to provide clearances. Dangerous leaning trees and overhanging limbs must be removed or pruned to eliminate potential contact with conductors regardless of the vertical distance above conductors. The contractor is not required to remove trees over 18 inches diameter at breast height. These trees are removed by Met-Ed where permissible. This removes some risk for the contractor in that large, expensive tree removals are removed at Met-Ed's expense.

Weekly time sheets must report the number of 50-foot line units completed as well as the number of trees trimmed, trees removed, area cut, and area of herbicide application. Invoices may be rendered monthly for the portion of the job completed based on the linear distance reported on weekly time sheets. Partial payments are made up to a maximum of 80% of the firm lump sum price. Final payment is made upon satisfactory completion of the job.

"Lateral" tree trimming and "Shigo" cuts are required. Clean-up and disposal of brush must be performed in a manner agreeable to the property owner.

The contractor must submit hourly rates for labor and equipment for use during storm emergencies. Firm Price crews must be made available to Met-Ed during emergencies. An extension of the period of performance is provided if FP crews are temporarily assigned to emergency work.

Work that is not in compliance with these specifications is not approved for payment until it

is redressed to conform with the specification. Failure to complete the work within the period of performance may be remedied by stopping payments and by terminating the work at the expiration date. The job is then completed by a different contractor assigned by Met-Ed. The total number of trees trimmed and removed are tallied for each contractor. The proportionate amount of the original bid price, less partial payments, is then paid to the FP contractor. The volume of work completed, not the mileage completed, determines final payments, because tree density per mile is variable.

The scope of work is defined by the individual circuit maps supplied for each job and a requirement to provide clearance to all electrically connected portions of line as they are encountered in the field. The lump sum bid price should be formulated from accurate field estimates for each span of work. Sufficient time (six weeks or more) is needed for contractors to perform these estimates.

Maintenance of Competition

The success or failure of FP bidding is directly dependent on the level of competition for FP jobs. Met-Ed currently extends bid invitations to 18 qualified line clearance contractors. Eleven of these contractors were successful bidders in 1986 (Fig. 6).

Met-Ed has attempted to create and maintain a competitive "atmosphere" for FP bidding. All price information is held in strict confidence before, during, and after the award process. Forestry personnel strive for uniform enforcement of specifications. Two contractors were permanently removed from the qualified bidders list because they failed to conform to the specifications. This drastic measure was necessary in order to maintain work quality standards. Fair administration of all FP contracts is critical to the future potential to procure competitive prices.

Fig. 7 shows the annual distribution tree maintenance costs per mile for the period of 1980 through 1987. These annual costs have remained near \$2500 per mile throughout this seven-year period. Since 1984, the cost per mile has dropped slightly and is currently at a level similar to 1981 costs. This ability to "hold the line" on tree

maintenance costs is primarily due to the success of the Met-Ed F.P. bidding system (Fig. 7).

MET-ED DISTRIBUTION TREE MAINTENANCE:
CONTRACTORS PERFORMING DISTRIBUTION TREE MAINTENANCE

NO. OF CONTRACTORS

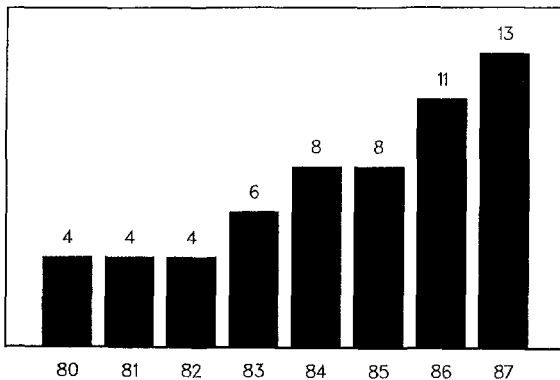


Fig. 6.

MET-ED DISTRIBUTION TREE MAINTENANCE:
COST PER MILE MAINTAINED; T&M + F.P.

COST PER MILE

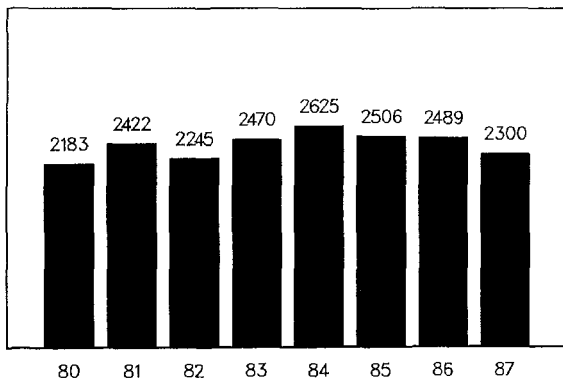


Fig. 7.

Conclusion

The lump sum FP procurement system employed by Met-Ed has achieved a reduction in line clearance costs of approximately \$250 per mile. Met-Ed also experienced a significant reduction in the supervisory effort required to supervise and administer FP contracts versus T&M contracts. This bidding system contains many features designed to limit contractor risks and to maintain keen competition for the work offered.

Metropolitan Edison Co.
2121 Sullivan Trail
Easton, PA 18042