LINE CLEARANCE PRODUCTION INCENTIVES AT DETROIT EDISON[1]

by Jerome E. Knight

Production incentives are not a new concept for most electrical utilities. Indeed, it is common practice on major construction projects such as power plants, switching stations, substations and transmission line construction to award contracts on a low bid basis based upon very detailed specifications. In the utility lines maintenance work, competitive bidding is very common although some maintenance may be performed via time and material.

Tree clearance for existing overhead lines is usually considered a maintenance function; however, in most instances tree clearance is done without any production incentives on a cost plus basis. This is rather surprising, since maintenance line clearance is often the single largest annual maintenance expenditure in the overhead lines budget. Our lines and transmission and distribution managers are vitally interested in reducing costs and increasing effectiveness for this function. One way of doing this is to develop an incentive line clearance program.

Procedures. For many years, Detroit Edison's line clearance maintenance program consisted of assigning contract crews to specific areas where they would obtain their own permission to do work, to trim and to remove trees. Our line clearance budget increased until it accounted for nearly ⅓ of the total Overhead Maintenance and Operating Account. It became apparent that there was a need for improvement in this costly area.

In 1955, we started two programs: one to establish units of tree work with standards of time, and the other a system of evaluation and inspection that would designate the work to be done in each area ahead of the crews. We divided our entire service area into approximately 900 numbered maintenance areas for scheduling and recordkeeping. These areas have geographical boundaries such as townships, villages, cities or parts of these.

Each of the Divisions then developed a schedule showing which areas would be worked each year and the type of work to be done. The basis for determining these schedules was tree growth as it related to tree species, soil conditions, amount of clearance obtainable, etc. A three-year cycle of trimming was selected for 95% of the areas. Some locations with fast growing trees were placed on two-year schedules, others on longer cycles where tree interference was minimal. The field work, trimming, removing, spraying, and brushing, was broken into a series of units each descriptive of a particular operation. The contractors bid on these units by Division. The contract crews reported units completed, hours work per unit, indirect time by category and the location of work. With this time reporting system, we were able to establish standards useful in estimating tree costs on new business. With records indicating the amount and cost of tree work done in an area, we were able to accurately forecast budgets for the next cycle in that area. We had a record of contractor crew production by which we could establish norms useful in determining optimum crew size and equipment.

Results

1. Our outages caused by trees on 4.8 kV and 24/40 kV lines have been reduced significantly. In the late 1950s, tree caused outages on 4.8 kV lines were as much as 26.2% of all outages reported for that voltage, 8.2% of all outages on 24/40 kV lines, and 10.3% of all outages on 120 kV lines. Along with this decline in tree-caused trouble, there was a significant decline in equipment failure on our 4.8 kV lines.

Recently, outages caused by trees have increased on circuits installed at 13.2 kV lines. This

[1]Presented at the annual conference of the International Society of Arboriculture in Toronto, Ontario in August 1978.

indicates a need for greater tree clearance on a grounded wye system.

2. Formerly, contract crews had been left to themselves and obtained their own permission to trim or remove trees and were in many cases making their own decisions. Now the work is designated for them, the price is already established, and the utility has made the decision of what is to be done. Costly and doubtful practices have been recognized and eliminated.

3. Units have provided a means for non-tree people such as engineers, line designers and others to accurately estimate costs of tree work.

Summary. In the line clearance work we have established a long range schedule with the necessary recordkeeping to facilitate it in each Division. This program is aimed at the control of the amount of money spent for this kind of service as well as the reduction in line troubles resulting from tree interference.

Supervisor of Forestry Services
Detroit Edison Company
Detroit, Michigan

CONTRIBUTED ABSTRACT

Detection and Treatment of Girdling Roots on Selected Norway Maples

A number of trees growing in the urban environment are thought to be weakened and killed by the abnormal girdling growth habits of some of their roots. This girdling action is presumed to reduce the translocation of water and nutrients by crushing conductive tissues at the base of the truck and/or large lateral roots. This reduction of the flow of nutrients is commonly expressed in less than normal vegetative growth and symptoms of foliage nutrient deficiency. Trees affected usually do not die suddenly. They gradually weaken and die as a result of environmental stresses or attack by pests.

There are two basic types of girdling roots: Surface and subsurface. The leaves of a tree suspected to have girdling roots may appear abnormally light green in color and may abscise earlier than normal in the autumn. However, identical symptoms are associated with many other problems, and the girdling root must be observed to make a positive diagnosis.

There were seven treatments done to 480 trees in 1977-78.

Controls No girdling roots removed). (1.). Normal trees — no girdling roots present; nothing done to tree. (2.) Girdled trees — no fertilization or trimming. (3.) Girdled trees — fertilization but no trimming.

Treated (girdling roots removed). (4.) No fertilization or trimming. (5.) Fertilization but no trimming. (6.) Trimming but no fertilization. (7.) Trimming and fertilization.

The ultimate objective of this study is to gain insights into the identification, treatment and length of time required to treat girdling roots on urban street trees. Girdling root treatment is not done by the majority of urban foresters on an ongoing basis.

The specific objectives of the study are to evaluate the degree to which girdling roots are a problem on Norway maples (*Acer platanoides*) growing along streets in a defined area of the City of Ann Arbor, determine and describe the percentage of trees with surface girdling roots that also have subsurface girdling roots, identify and describe bole and foliage characteristics that are diagnostic of trees suffering from the effects of surface and subsurface girdling roots, identify and evaluate the effects of factors that contribute to the formation of girdling roots and to determine the extent to which trees with girdling roots are benefited the first two growing seasons after combinations of treatments including root removal, fertilization and foliage pruning.

The study will be completed during the summer of 1979 and incorporated into a doctoral dissertation available from the University of Michigan. *Robert L. Tate,* City Forester, Dept. of Parks and Recreation, City of Ann Arbor, Michigan.