PROPOSED REVISION FOR R/W MAPPING AND PLANNING PROCEDURES

by T.A. Young and W.T. Rees

The right-of-way maintenance mapping and planning system currently in effect at Monongahela Power involves the use of arbitrarily defined work units. This system has become increasingly unwieldy and cumbersome to use. Originally, work units were designed to establish order where none had existed. However, complaints have surfaced from many sources (customers, linemen, engineering technicians, right-of-way technicians, management) that indicate poor distribution right-of-way in many areas, largely as a result of our obsolete work unit system which is based on insufficient and unscientific planning data.

Present work units generally do not coincide with circuits. In most cases, a work unit will only cover a portion of a circuit or sometimes portions of two or more circuits. Consequently, a large percentage of work units may be completed in an area while it is quite probable that a similar percentage of circuits will be incomplete. *This does not insure circuit integrity.*

Another problem that arises under our present system is the type of map utilized. There are no maps that are drawn specifically for the right-of-way program, therefore we must use whatever is available. Currently we are using 2000′ USGS Quadrangle maps that are supplemented by USGS 200′ maps and city street maps. This problem is reflected in the fact that a work unit may require one, two, three or more maps to accurately cover its specific area. These maps are often unreadable and usually outdated.

Planning data also is a problem. The yearly budget and number of contract crews are determined by the number of trees to be trimmed and removed, and the number of acres to be sprayed or cleared. This information is highly unreliable because it is subject to interpretation as it is outlined in the COM Manual. Also it is supplied by untrained contractors and even assuming initial accuracy, the information is highly subject to change from scheduling year to scheduling year.

Work Units/Mapping

In order to increase the reliability of our distribution circuits, the following recommendations are proposed.

Circuits. The work unit concept will be maintained. However, work units will be reassigned to encompass individual circuits or portions of circuits. A work unit will not be set up to encompass more than one circuit.

Uniform Size. Work units shall be of uniform size. This size will be measured in line miles, records of which are accurately kept in Engineering. To allow for differing circuit sizes, a circuit can be divided into more than one work unit of uniform size. These work units of the same circuit will be designated by letters of the alphabet, e.g., 57a, 57b and 57c, etc. This system will concide exactly with our circuit reliability reports, thereby allowing for rapid pinpointing of problems and timely scheduling of those problem areas. Also, information from engineering foot patrols can be more fully utilized.

Periodically, as circuits change, the work units will have to be changed accordingly. However, we do not view this as a serious problem.

Fusing Maps. To accompany this new system of work units, fusing maps will be used as a record keeping replacement for USGS Quadrangle and City maps. These fusing maps will be used not only for purposes of permanent record keeping, but also, where accuracy permits, for contract crews to use in finding locations and for field record keeping. USGS Quadrangle maps will continue to be used for aerial patrols, notations of restrictions and where necessary, for contract crew members to use in the location of job sites as well as the field recording of completed work. The USGS 2000′ maps will be used exclusively for transmission and subtransmission work planning.

Benefits of the fusing maps are many. Most importantly they reveal only the necessary information for circuit work and are revised more frequently than USGS maps. Since no work unit will encompass more than one fusing map, the time consuming cutting and piecing of maps that currently is necessary can virtually be eliminated for record keeping purposes.

Planning Data

Since new work units will have to be established throughout the System, previous years' records will be rendered useless. In recognition of this fact, and as noted earlier, because our present information is at best unreliable, a new system based upon statistical concepts is outlined in the following paragraphs.

Line miles. As mentioned earlier, each work unit will be made into a uniform size. This size, as yet undetermined will be based on line miles (a line mile is defined as a line one mile long and 60 feet wide.) Line mileages for town and rural units will differ. Line mileages for each circuit are recorded by voltage in each division.

Scheduling. As specified in the COM Manual, a rural work unit is to be scheduled for work every five years. Therefore 1/5 of the work units will have to be scheduled for R/D truck work, 1/5 would have to be scheduled for hydraulic spray work (perferably one or two years after R/D truck work) and 1/5 would be scheduled for aerial work (preferably one or two years before RD truck work.) As per COM Manual, town units will be scheduled every three years (1/3 of the units/year). This type of scheduling is made possible because of the uniform size concept.

Inventory. Prior to scheduling, each work unit will have to be inventoried to detemine the number the spray miles for aerial work. At this time, work areas will be located on the maps for aerial and hydraulic spraying.

Implementation. The first year's implementation of this program will require the existing number of crews in each division to be scheduled. With no data base for these work units, it must be assumed that these crews will be sufficient to accomplish scheduling; one or two more crews per division shall be added to handle the inevitable trouble spots.

Mathematical constant values. After the first year, mathematical constant values can be determined to evaluate and ascertain Division requirements.

Cost constant. Upon completion of the work units or portions thereof in a given year, a *cost constant* will be established by dividing the *total cost* by the *total line miles worked* giving a value of cost per line mile.

Crew constant. Also, a *crew constant* will be established by dividing the *total number of crews* by the *total line miles worked.*

Chemical utilization constant. In addition, a *Chemical Utilization Constant* can be determined to account for gallons of concentrate used. This will be calculated by dividing the *total gallons of chemical used* by *total line miles worked.*

These three constants shall be established separately for Town Units, Hydraulic spraying and R/D work as well as for transmission and subtransmission lines per Division.

Coefficient of efficiency. Also, a *Coefficient of Efficiency* will be established by the comparison of planned work with completed work.

These mathematical constants will then be used for crew scheduling, and also to aid in budget planning.

It should be mentioned that for a single work unit, the constants would not necessarily be accurate, but over an entire division based on the Law of Averages, accuracy would be insured.

Examples

Examples are as follows:

Crew Constant. If X amount of line miles are scheduled for work, the hydraulic crew constant will be multiplied by X to get the number of crews needed for hydraulic work.

Cost Constant. If X amount of line miles are scheduled for work, the hydraulic cost constant will be multiplied by X. This value will then be adjusted for the current inflation rate to get a final cost for hydraulic work.

Chemical utilization constant. If X amount of line miles are scheduled for work, the Chemical Utilization Constant will be multiplied by X to get the number of gallons of chemical needed.

Coefficient of Efficiency (as a constant). If X amount of crews/line mile (the crew constant) have been determined for the year most recently past; and if Y is the amount of crews/line mile (the crew constant) that was used to scheduled the year most recently past, then, divide X by Y to get the Coefficient of Efficiency.

Discussion of Usage

The crew constant will be the sole method for the determination of crew needs. However, as mentioned earlier, the cost constant will be used as an aid in budget planning. When estimated cost has been determined by the use of the cost constant, it will then be compared to the value obtained by the traditional method of cost determination. (Total number of crews × cost/crew + chemical costs). This comparision technique provides an effective tool for the determination of an accurate budget.

The coefficient of efficiency is a method to determine the accuracy of our crew scheduling as well as provide a mathematical tool for future adjustments.

Traditional values such as trims, removals, acres cleared and acres sprayed will be retained, but only as a relative of production — nothing else!

As time progresses, the mathematical constants will increase in accuracy as the data base increases and as scheduling becomes stabilized.

Conclusion

There are many benefits that can be realized from the changes noted above. Accurate determinations can be made to give accurate and reliable data. These data can then be parlayed into a flexible, workable and overall scientific program.

Monongahela Power Company
1310 Fairmount Avenue
Fairmount, West Virginia

ABSTRACT

WELLER, S.C. 1981. **Allelopathy — a new word in agriculture.** Indiana Nursery News 42(2): 4, 15.

Allelopathy is defined as reduced plant growth caused by the release of toxic substance(s) by another plant sharing the same environment. The toxic substance is usually a chemical that in some way interferes with normal plant growth. Allelopathy has been termed "chemical warfare between plants." An easy way to recognize the difference between competition and allelopathy is to remember that in competition something is removed from the environment, while in allelopathy something enters the environment. Both situations may result in reduced plant growth. A familiar example of allelopathy is the effect black walnut can have on other plants. Leachates of black walnut leaves contain a substance called juglone that, when released into the environment, can influence the growth of lilacs, apples, white pine, and tomatoes growing in association with the walnut tree. Ornamental plants that produce allelopathic chemicals and limit herb growth beneath them include: *Pinus densiflora* (Japanese red pine), *Robinia pseudoacacia* (black locust), *Platanus occidentalis* (Eastern sycamore), and *Celtis laevigata* (sugar hackberry). Other examples of allelopathy by ornamental plants are still being studied. This interesting phenomenon of allelopathy is now being recognized as an important influence in the environment. Allelopathy influences plant succession, soil microbial populations, and in most cases acts as a survival mechanism for the plant producing the toxin. It is important in seed germination, and in many chemical reactions in the soil.