COMPUTERIZED DISTRIBUTION TRIMMING AND CONTRACTOR PRODUCTIVITY MEASUREMENT[1]

by Robert E. Ritz

A fair comparison of any work measurement program employed by a utility company must also depend on a fair comparison of the companies being compared.

I would like to acquaint you with the Rochester Gas & Electric Corp. It is an investor owned utility, of medium size, serving approximately 285,500 electric customers. RG&E is geographically located in north western N.Y. along the southern shore of Lake Ontario. The company is composed of four major districts: Rochester, Canandaigua Fingerlakes, Lakeshore, and the Genesee Valley District. The entire system has approximately 16,193 circuit miles of O.H. distribution lines, and encompasses an area of approximately 2300 sq. miles.

In 1970, partly to justify the rising budget estimates related to distribution and transmission trimming, and partly to more accurately account for dollars spent on vegetation control, management directed that methods of measuring the "work" related to distribution trimming be investigated. Distribution trimming at that time was performed on a circuit basis, prompted by trouble slips received which indicated to the dispatcher which circuit most urgently needed attention.

Since the early 1950's, RG&E has employed non-union contractor owned trim crews. In 1970, there were ten trim crews each with 4 men, a bucket truck, chipper body truck, and chipper; totaling 40 men, 20 trucks, and ten chippers. In 1981, there are 12 crews, radio equipped, each with 3 persons, a bucket-chipper body truck, and chipper, supervised by the contractor's general foreman; totaling 37 persons, 12 trucks, and 12 chippers.

It was not possible for RG&E to measure productivity in the years up to 1972, but we have been measuring it accurately since 1978. We firmly believe at this time, that we have increased trim crew productivity more than 200% in ten years, and accomplished this increase with fewer workers, and fewer trucks.

In 1971, every known and a few unknown methods of measuring the output of a distribution tree crew was investigated. We reviewed the circuit method then in use, surveyed the cut and count, weighing of chips, etc. and realized that the thing that was lacking was a common denominator, or a basic unit of measurement for all types of distribution trimming.

Dividing the various circuits up into miles seemed a good place to start, at least when the circuit was reported complete we would know how long it took to trim a mile of *that* particular circuit. If the circuit was later cut or extended, it would change our man hours/mile data, which was not very reliable to begin with. It would have been difficult to compare 2 or more circuits of varying lengths and arrive at a realistic value for man hours/mile.

A physical unit or area was needed. We considered dividing the entire Rochester district into ten areas of approximately equal size. When it turned out that each one would be approximately 20,000 acres, the ten division scheme was abandoned, even dividing by 1,000 and 2,000 didn't define our need.

For many years prior to 1980, RG&E had devised and was using a grid system of mapping, which covered the county of Monroe and went beyond in some areas. It is called the secondary block map system. The numbering system used two grids at 90° from each other with "0" at the approximate center of the city of Rochester, and fairly close to the center of the county as well. The rectangles formed by vertical and horizontal lines were called block maps. All those maps below the "0" horizontal *ended* in odd numbers and those above *ended* in even. To the left of the "0" vertical the number *began* with odd numbers and to the right *began* with even.

[1]Presented at the annual conference of the International Society of Arboriculture at Boyne Falls, Michigan in August 1981.

It may seem, at this point, that I am dwelling on trivia, but this kind of block numbering system allowed the mapping department considerable latitude in extending their mapping and numbering without going back to square one and starting over. Further it was important to our trimming plan that the same latitude be allowed for it's expansion. The decision was made to use the block map as the basis for the system.

The data were kept in a loose leaf binder, the pages were lined and each line was serially stamped to include all block numbers from 100 to 1500. When the appropriate data had been gathered on a complete mix of various kinds of blocks, historical data, and experience in the field, was used to determine how many days it would require a distribution trim crew to complete the block trimming. Crew days were converted to man hours in the event that the crew manpower might be changed at a later date. The results which followed indicated that the complete mix of 350 blocks, in this first sampling, fell into eight general groups by man hour estimates to complete.

The first group related to rural blocks with one or more highways or part of a highway through them, distribution lines were along the highway and all residences were serviced from the highway. The man/hours ranged from 3 to 48 or one hour for a three man crew up to 16 hours for the same size crew. Travel time and weather throughout the course of the year was calculated from historical data and made a part of the man hour estimates for each group of maps, in passing I might add that the Rochester, New York area is second only to Seattle, Washington in cloudy weather, and we reportedly have fewer than 80 days annually, when the sun shines from rising to setting without clouds.

The eighth group of block maps indicated man hour estimates which ranged from a minimum of 975 to a maximum of 1480.

Following a reasonable trial period, using the initial estimate, a contractor productivity chart was printed in 1978 and computer upgraded in October, 1980.

The eight groupings were numbered and designated "block density index." Blocks of varying density were distributed among the 13 distribution trim crews, with instructions that when they were completed it would be required that the starting and completion dates be shown on each by the crew foreman.

There are approximately 1500 blocks in the Rochester district, each is approximately .22 sq. miles or 138 acres, (making the unit of measurement about 19,862 acres smaller than the original ten divisions).

In the years between 1971 and 1973, the county was traveled many times, with frequent trips around the limits of many blocks, collecting base data on rear lot secondaries, street fed services, general vegetation, species and age, etc. All of this with regard only to the vegetation in conflict with our overhead lines.

The maps were subsequently returned with the required data on them, but only a few fell within the range of the estimated man hours. Most showed far more man hours than was estimated. When crew foremen were questioned, they said the only requirement that was stipulated was, start and finish dates, nothing about in-between days.

The maps which came back close to the estimates were completed by contractor crews, who do nothing else but block trimming.

The daily time sheet in use at that time did not help much, to clarify the block man hour data we sought, it became apparent that the whole time accounting system as it related to tree crews would have to be re-designed and streamlined.

The weekly time and work report was designed to cover the data needs of the trim system and also coincide with the contractors pay period. This new form provided all the necessary data columns needed for the computer, as well as information required by other departments.

A weekly inspection became a necessity to inform the "data input coordinator" whether or not all the crews were fully manned and equipped, if they were at the right location and if the required clearance was being obtained.

The *clearances* required were listed on a *chart* by voltage, sealed in plastic and issued to every crew foreman to be kept in an obvious location in the cab of the truck.

The weekly inspection report is completed each Friday by the tree crew inspector, who visits

every crew in the field at least once daily, his arrival time is continually staggered. In addition to providing the aforementioned sources of data, it became necessary to design and obtain three rubber stamps to be used on each block map.

One to be filled in by the crew foreman prior to returning a block map. Two others used, after the map is received completed. The stamp used prior to dispatching is used to more readily organize the data we need from the field. The date *started* and *completed* are still needed. The number of days that work stopped on the block must be shown and explained on the back of the map, i.e., capital jobs by number, trouble slips and locations, and emergency trimming.

The total number of man hours is calculated by the contractors general foreman and checked by RG&E. It should be noticed at this point that all the data from the field comes from the contractor, not in cuts made or chips weighed but, man hours spent in a designated area. His entries are double checked against the weekly time and work report, and the weekly inspection report only when an error in bookkeeping is suspected.

Neither the crew foreman or his supervisor is officially made aware of the block density values in man hours, but they have become aware on their own that RG&E is measuring something. When the map is returned completed, two other stamps are affixed.

A square stamp, which is used to show how block density was estimated. Each map returned is divided into quadrants, the density of each quad is indicated, and when the sum of these is divided by four, the block density is determined and the appropriate density index circled. The "mean" or estimated man hours is written below the circled number, to be used later to determine the C.P.I.

The third stamp is the "data input strip" and is used by the data input coordinator to make entries into the computer.

The first entry is the block number, the second the density as taken from the density square stamped on the map, the next is the man hours as reported by the contractor, then the crew number, followed by the date completed. The last item will, in the future, be lettered C.P.I. for (contractors productivity index).

The C.P.I. is now done long hand using a very simple mathematical calculation which divides the man hours as reported by the contractor by the "mean" or estimated man hours from the density chart, to arrive at a figure which indicates if the contractor completed the block *at* the estimate, i.e., 1.00, below the estimate, 0.xx, or over 1.xx. The computer will make this calculation automatically in the future.

Productivity of any crew can be determined after the completion of one block, ten blocks, quarterly, annually, or for any chosen period, by merely adding up all the C.P.I.'s for a given crew and dividing by the number added. This figure represents the contractors productivity and will also appear in future print-outs calculated by the computer.

When the coordinator has completed the input process, the blocks are further accounted for on a large 9′×4′ plexiglass covered wall map of the Rochester district. Small squares, color keyed by year completed, are affixed to the plexiglass over the appropriate block by the coordinator. This provides a visual assessment of the annual progress of the system. Closer scrutiny will also indicate (by color keyed square) the previous date that the block was trimmed. By 1982 we hope to use this information, coupled with data from the computer to formulate a realistic repeat cycle.

Rochester has at least two very sensitive environs that require the same blocks to be trimmed every year. These areas I'm sure will remain on a one year repeat cycle. The balance of our system we hope to get on a 5 year cycle.

In conclusion let me add that our distribution trim efforts are plagued by the same problems as many others in the industry. Permission to trim was one of our most annoying ones, prior to 1979 when property owners were not at home, prestamped cards would be left at homes along the streets that the crew intended to be on the following week. If the owner refused to grant permission to trim, the card would be mailed and the block trim process would be held up, this method was inefficient and expensive.

At RG&E, we had a need to reduce these instances, and circumvent them entirely if we could.

The door knob hanger approach seemed business like and efficient, and has been in use for two years with excellent results. In as much as the right to trim is already granted in each property deed, we sought only to enter the property, to clear the rear lot lines, clean up, and move on. The words permission and property were purposely avoided and apparently have not been missed by anyone.

The computerized distribution trimming system and contractor productivity measurements, designed and used by RG&E, have been recently cited as a "sound system of measuring" by one group of auditors. Those of us who manage it intend to continue to improve it.

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ABSTRACT

Keim, Randolph, L.J. Klure, and G.A. Zentmyer. 1981. **A foliage blight of euonymus caused by Phytophthora.** California Agriculture 35(5 & 6): 16-17.

Euonymus is popularly recognized for its colorful and generally variegated foliage that differs greatly from one cultivar to another. Several cultivars were tested for susceptibility to Phytophthora. The disease was first detected on 'Goldspot' by the senior author, and three isolates were subsequently taken from three separate 'Goldspot' plantings at different locations. Typically, in a large production nursery the first indications of the disease are dead terminal shoots, which must be pruned away before affected plants can be marketed. The dry, dead shoots are usually observed two to several weeks after a rain, but early stages of the disease can be detected by careful inspection soon after favorable weather conditions for infection occur. To help control collar rot of rooted cuttings, it is important to take cuttings only from disease-free mother plants grown without overhead irrigation and treated regularly with suitable fungicides to ensure a disease-free condition.