

THE ACADEMY OF ELECTRICAL CONTRACTING

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Productivity

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PRODUCTIVITY

Maximum productivity in the business of electrical contracting may be achieved when the different specialists within the organization pool their collective efforts in order to coordinate estimating, job management and purchasing with the installation in the field with the result that a profit can be made and the job completed within the time limits allowed by the owner.

Coordination of the specialists within the business can be achieved best by having a complete business system that permeates the entire structure of the business. This means that all elements of the business must be defined, documented and transmitted in a form through which employees may understand and implement the plan of operation.

The efficient installation of an electrical construction job and the achievement of productive manhours of work are difficult to accomplish. There are many factors involved, some of which are controllable by the electrical contractor and some are not. The planning, scheduling, and mastery of the details of installation by everyone concerned are mandatory if satisfactory results are to be achieved; and this demands close coordination between the estimating data, job management and the field personnel who make the installation.

It is the contractor's responsibility to provide maximum field support. No matter how conscientious the field man might be, there are many things over which he has little or no control, but which lie in the contractor's control. The implication that labor is the foremost ingredient in installation work is undeniable; but if productive manhours of work are to be achieved it is mandatory for the contractor to control the flow to the job of the right type of material, in the right quantity and at the right time.

In order for a business to achieve outstanding accomplishment in the service it performs, it is necessary for it to be composed of individuals who have been properly trained for the task to which they have been assigned, and for whom suitable forms of communications are provided so that one specialist can pick up where another leaves off for the ultimate achievement of maximum productivity.

There is a tendency in our industry to think of productivity exclusively as a high degree of production in the field; and while this is of predominant concern to the contractor it, alone, is not adequate to accomplish the needs of the business in order to be competitive and make a profit.

The dictionary definition of productivity is "the capability of effecting or contributing to effective production." Effective production is not exclusively the result of hard work by the electrician, but rather the inclusion of the whole gamut of factors which result in a satisfactory accomplishment.

The Corps of Engineers defines productivity as "the

capability to perform a given task in a specified time, at a reasonable cost and with a minimum of waste." A reasonable cost is established by competitive bidding in the marketplace, and the elimination of waste is considered when determining the cost; so in a sense, the real measure of productivity is the capability of the contractor's organization in concert with the field personnel to compete in the marketplace and successfully meet the cost requirements of the job.

It must be recognized that the electrical contracting industry has two levels of competition in the marketplace - one using organized labor, and the other using random labor. Ordinarily, the wage scales and fringe benefits, together with working conditions of one are considerably different from the other; but fortunately, the one with the higher benefits is capable of furnishing labor with a better background and technical training. Therefore, it is feasible that these qualifications may result in much better productivity on the one level than with the other, but the contractor's principal interest lies in workmen who can furnish productive manhours of work. Since the individual's work ethic is only one dimension of total productivity, it is mandatory for the contractor to provide maximum field support if our industry is going to be able to provide a higher standard of living for our employees.

In industry, productivity may be defined as the ration of effective work actually done to that which could have been done under standard conditions which are uniform and well established by usage. These parameters apply more to manufacturing than to contracting, and they emphasize that the productivity of one product over another may be greatly improved by better production methods. Two of the outstanding improvements of this type are Henry Ford's "automobile assembly line," and the use of the basic oxygen furnace where steel is produced in about 1/10th the time required in the open hearth. We can effect this type of improved productivity in our industry by employing such practices as pre-assembly of meter service centers, motor control service centers, and unitized fixture assemblies—an effort we can ill afford to overlook.

The limits on individual productivity which are imposed by the nature of electrical construction work wherein it is necessary to fit our systems into a structure by hand, piece by piece over wide areas of space, greatly inhibit improvements of a major nature in the productivity of the work; and this, in turn, makes it mandatory for the industry to justify its existence by doing the things which we know can be done to continually improve in the performance of our work.

The definitions of productivity which we have considered emphasize, in each instance, the requirement of capability on the part of the instigator. Capability relates to the quality of having general efficiency with physical and men-

tal ability. It should be recognized that a contractor or journeyman could have physical and mental ability without having general efficiency, and I submit that an industry consisting of a predominance of this type of people would be hard-pressed to achieve a very high degree of productivity.

Efficiency is defined as "effective operation as measured by a comparison of production with cost." *It appears that this is the crux of the whole matter of productivity - to be able to bring about effective production within the realm of competitive cost limitations.* Performance such as this implies "excellence in operation."

John W. Gardner, in his book titled "Excellence" states, "The transformation of technology and the intricacies of modern social organization have given us a society more complex and baffling than ever before, and before us is the prospect of having to guide it through changes more ominous than any we have known. This will require the wisest possible leadership, but it will also require competence on the part of individuals at every level of our society. The importance of competence as a condition of freedom has been widely ignored. Keeping a free society free, vital and strong, is no job for the half-educated and slovenly. Free men must be competent men.

"Free men must set their own goals. There is no one to tell them what to do; they must do it for themselves. They must be quick to apprehend the kinds of effort and performance their society needs, and they must demand that kind of performance from themselves and of their fellows.

"But excellence implies more than competence. It implies a striving for the highest standards in every phase of life. We need individual excellence in all its forms - in every kind of creative endeavor, in political life, in education, in industry - in short, universally."

Unfortunately in our industry, the way it is structured, it is too easy for contractors to survive without having suitable qualifications because they can rely on the field forces to make up for their deficiencies. To them, productivity would be a desirable thing to have, but they realize that they do not have the weapons with which to achieve it and in many cases they can get by without it.

At this point, it would be well to consider what the requirements are for effective production.

Probably the most important qualities are planning and scheduling. In order to do this there must be available a proliferation of information about the job which can be used for this purpose. The information will come from an accurate, detailed estimate broken down into sections of the job which correspond to natural subdivisions of electrical construction work. All of the scheduling done for electrical construction work must be predicated on the general contractor's construction schedule for the job, and the accuracy of the electrical schedule will be largely governed by the accuracy of the "general's" schedule. An accurate schedule makes it possible to assign requirement

dates to material purchase orders with confidence that the material will be on the job when it is needed, and also that manpower and tool requirements may be anticipated with accuracy.

Planning is the responsibility of Job Management which also provides field support for the job which is manifested by the selection of good supervision and workmen.

This department also prepares the plans for field installation, develops an appropriate bill of material, and provides on the job proper facilities to accommodate material, tools and equipment handling and storage.

It is essential for the foreman on the job to know how he can make his time as productive as possible by doing things that the journeyman would otherwise have to do in terms of the eight major time-consuming activities performed in the process of handling and installing material on the job, such as: studying plans, ordering material, receiving and storing, moving to point of usage, tooling up, measuring and locating, installing and nonproductive activities. With a crew of 10 men, 74% of the foreman's time can be productive in terms of manhours of work, thus leaving 30% of his time for supervision.

It is essential for the field supervision to be constantly aware that maximum productivity will be enhanced when a high degree of morale exists among the field employees.

Good morale is largely the result of a high degree of respect on the part of the employee for the company's mode of operation. The dictionary definition of morale is as follows: "Morale is the prevailing mood and spirit conducive to willing and dependable performance based upon a conviction of being in the right and on the way to success, and upon faith in the cause or program; and upon leadership - usually connoting a high, confident, aggressive, resolute, and often buoyant spirit of whole-hearted cooperation in a common effort."

The attainment by management of a high degree of morale among its employees is essential for a high degree of productivity, and it is the essence of excellent employee relations.

Effective communications throughout the channels of the electrical contracting business may be established through the use of installation standard drawings which illustrate the details of the manner in which specific materials may be fastened, mounted, suspended, and supported in accordance with the procedure used by the estimator, processor, purchasing and finally the installation in the field. Each step in the process of directing information from one step of the operation to another is communicated by these drawings so that each successive step in the operation shows through the illustration on the installation standard drawing what material was used in providing the ultimate bill of materials.

The U.S. Chamber of Commerce published a manual titled, "the American Competitive System," from which the following quotes have been taken:

"Competition is of cardinal importance in the scheme

of private enterprise. Competition operates to bring about lower prices, better products and better services, all for the enhancement of living standards and for the promotion of the welfare of individuals. It is a constant incentive to invention, to the perfection of manufacturing and distribution processes, and to the elimination of economic waste. A free enterprise economy is one in which free men show enterprise.

"Under a truly competitive enterprise system each person tends to get paid in accordance with his net contribution to total production. Education and training constantly lift the worker out of the lowest paid groups.

"Now that we have many millions of workers in labor unions, there is great danger that wage rates will rise more rapidly than productivity increases, thereby forcing

prices upward. The rise will impair the purchasing power of teachers, ministers, government employees and others whose incomes are more or less fixed. Labor itself suffers when it over-prices its services and prices itself out of the labor market. Labor as a whole, in contrast to small isolated groups of workers, has far more to gain by raising total production in which they can then share under a competitive system than by collectively pressing wage demands beyond the rise in efficiency."

It appears that the matter of productivity clearly involves the two dimension of the "Electrical Construction Industry," namely, the contractors and organized labor; both of whom together must be able to bring about effective production within the realm of competitive cost limitations, and the ability of the marketplace to pay the price.