PA-CO-CA LINE REDUCES COSTS

THREE KEY FACTORS CONTRIBUTING TO COST REDUCTION

High quality and low cost are the prerequisites for prefabricated housing. How to realize them, however, is another question that no one has ever succeeded in demonstrating in a clear manner.

Theoretically, it is established that mass production, modernized distribution and technical innovation are the three major factors contributing to cost reduction. In our experience, however, mass production does not always result in cost reduction. The most decisive factor in cost reduction, in our opinion, lies with technical innovation. Supposing all these three elements were used together in perfect coordination in contributing to cost reduction, we still believe in the proportional distribution of 10% (mass production), 10% (modernized distribution system) and 50% (technical innovation), each percentage representing the degree of contribution, making up a possible total cost reduction of 70%.

On the other hand, we figure approximately 20% is needed to cover minus factors or elements, that is to boost costs such as expenses for research and development, training the staff to familiarize them with new techniques, and the cost of public relations to keep the users informed of new developments. Therefore, our die-hard effort in the pursuit of the three elements of cost reduction should culminate in a cost curtailment of 50%.

Let us now explain how we went about in our efforts to bring forth the full effect of these three elements.

We have built a plant suitable for mass production, and it did not turn out to be a very effective approach to cost reduction because we were rather overwhelmed by increases in interest on invested equipment and on the materials we had to keep in stock, as well as a much poorer working ratio of the plant than we had expected.

Our effort in modernizing and rationalizing the distribution systems in every way possible with respect to, for instance, cutting short the distribution channels, improvements of transportation and stock control, fell short of our expectations.

We have established plants in foreign countries as part of our rationalization program, but we must admit that they are a far cry from what we originally had in mind.

Technical innovation now has a firm grip on our thought as far as cost reduction is concerned. And, we believe in it.

The factory production of prefabricated housing is already a technical innovation. Nevertheless, there is a limit in fabricating things in factories and the same logic applies to our industry. We cannot bring all construction techniques being used on construction sites into organized mechanics, which the word, "factory," implies today.
The outlook on technical innovations

What we need here are designs or schematics planned for mechanical production, not by a single person, but by a team. It's important to develop "new engineering techniques" that will be a top priority for people who are searching for technical innovations. The next question concerns the materials. To facilitate the production of prefabricated housing in factories, it is necessary for men in the industry to look for new construction materials that are suitable for prefabrication. The new materials are now used in on-site construction. These materials are "arranged to meet the new materials composition in the modern concept of fabrication in factory. A new idea called "Materials for the Future" will be the second important thesis that we need to address.

It is amazing to know the number of kinds of materials, the enormous number of parts of a prefabricated wooden house. A house occupying a space of about 100m² needs about 5,000 different materials, that of course includes even small nails. It is also interesting to know that the number of parts required for making a van is 3,000, and the difference shows the intrinsic and complications involved in building a house. Besides, house construction is usually carried out on a barren site, without the usual of modern conveniences, further complicating the building process. The "development of new engineering techniques" must start by seeking designs that allow for the lowest possible number of parts. The panel system, core system and capsule system are examples of feasible technical approaches to achieving this goal. Narrowing the number of parts, not the quantity of material means and, in our attempts to do so, we had to deal with 100 kinds of prefabricated parts to a total of 5,000.

A new concept of "Multi-functional Material" was therefore created, one that we plan to use one of our major products for the coming year. This is to be achieved through the use of 500 different parts. Reducing the number of parts used will be the key to our success. We are confident that this approach is the only way to achieve our goal.
FUTURE DEVELOPMENT

As we have explained, the standardization of parts and the development of multi-functional materials accelerate technical innovations and, by the final analysis, contribute to cost reduction. What, then, about the diversification of demand for housing units? People basically want to live in a house that is more or less different in design and structure, as the production of prefabricated housing reaches the level aimed at by the industry now? These seemingly contradictory factors can be amicably reconciled in two ways. One of them is to first realize cost reduction in the main structural body, and divert the amount saved to provide a wider selection of auxiliary facilities such as interior and exterior furnishings and household equipment.

In the same concept, further diversification could be sought by providing customers with a wider range of choice on room styles, provided the customers agree to the basic model of housing structure specified by the manufacturer. In both of these cases, it is inevitable that additional costs will be incurred in terms of separate design and additional cost calculations. Therefore, these are only possible based on a prefabricated housing with a basic structure which is constructible at lower cost as the result of improvements in manufacturing technology. In other words, cost curtailment made available for the construction of the main body, must be enough to absorb whatever additional expenses customers may require in obtaining a house more or less different from others within the scope outlined above.

The other method of complying with the requirement for diversification of prefabricated housing rests entirely with the efforts of manufacturers toward increased sales. A manufacturer who can sell more units can have capital for stocking additional models. For example, if a manufacturer has to manufacture 100 units of a model house to break even, he can line up 100 different models providing he has the capacity to sell 10,000 houses a year. If he can sell 100,000 units a year, he can stock 1,000 different models. Then, the customer would really have a wide range of choice.

In this respect, too, technical innovations and cost reduction have much to do with sales. We have explained that technical innovations are a most effective means of reducing the cost of prefabricated housing, compared with mass production and the modernization of distribution channels. Nevertheless, technical innovations are possible only where there are larger sales. The reduction of cost of prefabricated housing is not something to be attained gradually by the improvement of production lines. Only full-scale research can make a drastic contribution.