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VA of FUJI ELECTRIC CO., LTD.

Combination VA and TuT Rationalization

By
Daisuke Watanabe

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VA Activity of FUJI ELECTRIC CO., LTD.

It is a great honor to have this opportunity give you my report about VA of FUJI ELECTRIC CO., LTD. I should like to explain with Over Head Projector and copies of summary of report already in your hands in accordance with the following order.

1. Outline of FUJI ELECTRIC CO., LTD.
2. Development and Result of VA Activity.
3. What is TuT Rationalization?
4. Organization of VA and TuT Promotion.
5. Advantage of Combination of VA and TuT.
6. Examples of VA and TuT.

1. Outline of FUJI ELECTRIC CO., LTD.

First of all I should like to introduce FUJI ELECTRIC CO., LTD. to help you understand more about our VA activity.

This company was established as an all-round electric manufacturer in 1923. It has grown up to be one of the leading electric manufacturers in Japan and the capital is now ¥21,414 million.

The main products of the company, as shown in Figure 1-1 are, divided into four groups, ie, E group, M group, S group and C group.

The company is in the 4th rank in scale in the electric field in Japan (except home use electrical appliances, telecommunication, measuring instruments and industrial machinery fields) with the employees of 14,853 and the annual business transaction of ¥216 billion. Figure 1-2 shows it in detail.

The organization of the company is shown in Figure 1-3. The VA and TuT Promotion Center belongs to Production Control Headquarter in the head office to promote the VA and TuT activity.

2. Development and Result of VA activity

The results achieved on the VA activity of the company are shown in Figure 2-1. It shows a transition during the past three years beginning March 1976 to March 1979.

The VA activity has brought about a satisfactory result in proposals equivalent to ¥2.6 billion in 6 months. And we still have a plan to further develop the above result. The basic problem is how to give the VA population a systematically scheduled education. A successful education has so far produced about 2,500 VA population.

A noteworthy fact here is the high ratio of part reduction. A 25% reduction of parts could be attained by VA. This explains by itself that VA can be extremely important method in TuT activity which will be explained later.

- * Now, this is the middle term plan of VA (OHP 2-2). Our successful experience through VA has given us a definite belief that the VA activity could be one of the most powerful method for cost reduction. Such confidence has made us promote further enlargement plan of VA.

- * The total cost configuration for all factories (except the head office and its branches) is shown in Figure 2-3. Material includes parts and products manufactured in other branch workshops. Therefore the resultant ratio after due modification is:

Variable cost 55 : Fixed cost 45

The rationalization is now in progress with the VA as a powerful means to control the variable cost, and the VA-TuT to control fixed and indirect cost.

3. What is TuT Rationalization?

3-1 Necessity of TuT rationalization.

The TuT rationalization was developed by Siemens AG of West Germany in 1973. The definition of term "Konto" was then introduced to apply to number of kinds of Typen(types) und(and) Teile(parts). With due consideration that the management cost and the indirect cost are generated by Konto, the TuT rationalization method is executed by every possible effort of controlling and reducing the management cost and the indirect cost.

Most of Japanese manufacturers have increased number of kinds of their products during the past period of high economic growth, which eventually has brought about limitless expansion of number of types and parts at the same time.

The world economy has now entered into a total depression since the oil crisis on the long term cyclical wave of Kondrachev (OHP 3-1). Under such a circumstance, limitless expansion of Konto is allowed no longer. On the contrary, it is the time to reduce Konto as much as possible to meet reduction of operation at the factories.

The reason is that the relative expansion of the management cost and the indirect cost gives a great deal of negative impact upon profit.

When increase in Konto is faster than the quantity of goods, kinds of parts less than the point N_c (quantity of parts on the turning point of profit and loss on the Silverstone curve --- OHP 3-2) increase. This influences negatively upon the profitability.

Fig. 3-3 shows in detail "why much attention must be paid to the TuT rationalization." Faster increase of Konto over the increase of production speed tends to greatly oppress the profitable factors. Therefore, the increase of speed in Konto must be maintained in a lower level than the speed of production.

3-2 ABC configuration of Konto and VA & TuT.

Fig.3-4 shows an example of Pareto analyzed Konto cost for a water wheel generator operated under 60 MVA.

Range I : A ninety percent of cost and 14% of Konto cover this range. This range is characterized by high cost parts and relatively low management and indirect cost. The VA can be an effective rationalization method for this range.

Range II : Ten percent of cost and 86% of Konto cover this range. Range II is characterized by low cost parts and relatively high management and indirect cost. The combination of VA with TuT can be an effective rationalization method for this range.

3-3 Factors to influence the indirect cost:

The Konto concept is introduced into the TuT activity. Rationalization is promoted by controlling and cutting down Konto or newly generated Konto with combination of Konto with indirect cost (OHP 3-5).

There exist three factors to influence the indirect cost.

Factor 1 is K (number of Kontos)

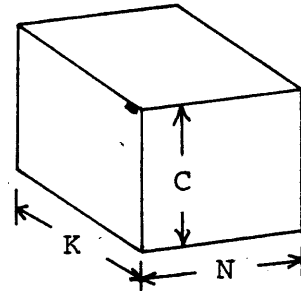
Factor 2 is N (number of process arrangement)

Factor 3 is C (cost for a process arrangement variable with characteristics of Konto)

$$\text{Indirect Cost} = K \times N \times C \dots\dots\dots (1)$$

The indirect cost can be shown as a cube with lengths of K, N and C respectively.

Cubic Configuration of Indirect Cost



The annual Konto cost is obtained by dividing the indirect cost by total Konto.

$$\text{Annual Konto Cost} = \frac{\text{Indirect Cost}}{K} = N \times C \dots\dots (2)$$

However, the actual process arrangement cost is affected by the characteristics of Konto.

For example:

C_1 : Process arrangement cost for a case with EDP controlled standardized parts in stock.

C_6 : Process arrangement cost for a case with newly designed parts.

There exist some more different process arrangement costs between C_1 and C_6 .

The three objective phases to reduce the indirect cost are as follows;

* Reduction of Konto K.

What is important here is that the reduction of Konto K enables to reduce both C and N at the same time. This is the reason why the utmost emphasis is placed upon the reduction of Konto in TuT.

Followings are the means to pursue the reduction of Konto:

VA (1st look and 2nd look)
reduction of types, unification of types,
improvements of products, system design,
standardization, generalization, etc.

* Reduction of process arrangement N.

The means to pursue the reduction of process arrangement N are VA on indirect divisions and rationalization of production control.

* Reduction of process arrangement cost C.

The means to pursue the reduction of process arrangement cost C are VA on indirect divisions, rationalization of production control, standardization and promotion of GT.

It is now clear that a close interrelationship between VA and TuT is a powerful means to reduce the indirect and management cost.

An outstanding feature of our VA is its combination with the TuT.

4. Organization of VA and TuT Promotion

The organization of VA and TuT promotion is shown in Figure 4-1. There are VA-TuT Promotion Centers in the head office and in all factories. Especially the VA-TuT Promotion Center in factories is characterized by the fact that its location is in design division as a general rule for the closest cooperation between VA and TuT.

About 70% of cost is determined at the design and development divisions. Therefore, decision making at the design division, for example, must be done from wide and composite standpoint covering production control, manufacturing, quality control, cost control, transportation, packing, installment, etc. as well. It should not be limited to narrow viewpoint or divisional interest.

Successful realization of the said concept depends greatly on the close cooperation between VA and TuT. For this purpose VA and TuT must be organizationally connected.

5. Advantage of VA and TuT combination

"Where there is Konto, there is a job" is a basic concept for any manufacturing person to remember. The above can be paraphrased "where there is TuT, there is a job."

Drawings are necessary to make parts (Konto). Then the production preparation divisions must decide manufacturing methods, jigs and tools and procurement of materials. Management and quality control must be exercised at the parts manufacturing process. As long as those parts are kept in stock, inventory control is necessitated.

Thus as a part (Konto) goes through every processing point along the manufacturing line, it necessitates the relevant indirect cost there.

Since the indirect cost forms a large portion of the product cost (WC), the VA to treat only the direct cost is not sufficient for the effective total cost reduction. This is because the indirect cost may expand while the reduction effort is being made for the direct cost.

The combination of VA and TuT enables reduction of the indirect cost as well as the direct cost. An evaluation standard must be established for judgement at routine work for the total cost reduction. When the above standard is used for the cost evaluation by VA, the total cost-down by the scientific method can then be realized.

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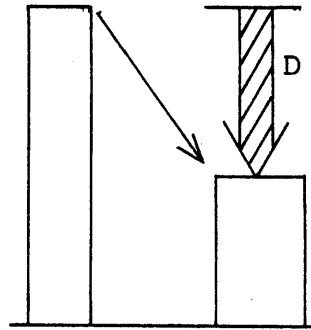
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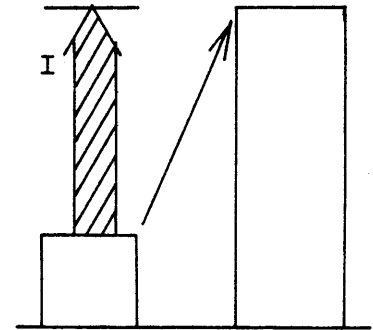
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If it is determined to make a kind of parts for an exclusive use for cost reduction, for example, further expansion of the relevant indirect cost by "I" may be generated in spite of the reduction of the direct cost by "D".



direct cost



indirect cost

If $D > I$, the improvement may be effective. If $D \leq I$, the improvement effort brings no meaning.

Increase or decrease of the indirect cost by increase or decrease of Konto must be taken into consideration for the total cost evaluation on the basis of the above understanding:

To reduce the indirect cost by reduction of Konto.

To reduce Konto by VA.

To reduce the indirect cost by VA upon indirect works.

To apply VA-TuT to systematization of the products and system design.

To apply VA-TuT to the manufacturing process for promotion of GT.

These are the approaches to the total cost reduction which have already brought about results. Let's take up some examples.

6. Examples

- 6-1 VA-TuT for motor accessory (dial thermometer).(Ex 1-3)
ABC analysis is performed about the amount of cost, Konto and the number of process arrangement of the motor accessory.

The dial thermometer is in the 5th rank in all phases of ABC analysis, meaning that this article is just appropriate and reasonable as an object of the analysis.

The function analysis through VA has brought about a reduction in the total cost and a great deal of indirect cost by the Konto reduction through TuT.

- 6-2 DC motor.(Ex 2-2)

An analysis in the specifications in DC motor has cleared its prescribed functions which the standard system ought to have.

It is an important approach by the VA-TuT combination to decide what portion of specification should be included in the standard system and how to correspond to the widest range of specification with the least Konto.

The exercise of the above approach has brought about a big improvement toward both cost and Konto.

- 6-3 Indexing the indirect (I.M.) cost cubic configuration to lower the total factory index.

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The volume of the indirect (I.M.) cost cubic configuration is used as an index for the amount of production.

K, N and C can be reduced by various VA-TuT approaches as above. The reduction of K, N and C reduces the index accordingly. This indicates the improvement of factory management.

7. Conclusion

The above is a brief explanation about the characteristic of VA of FUJI ELECTRIC CO., LTD. and the VA and TuT combination.

Thank you very much.

MAIN PRODUCTS OF FUJI ELECTRIC

E

Power &
Industrial
Electrical
Machinery

- ex.
- Turbines & generators
 - Nuclear Power equipment

M

Instrumen-
tation

- ex.
- Industrial instruments
 - Computer Control equipment

S

Standard
Electrical
Products

- ex.
- Semiconduc-
tors
 - Magnetic
motor star-
ters and
Contactors

C

Consumer
Products

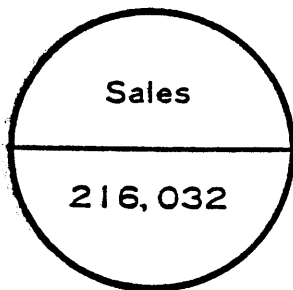
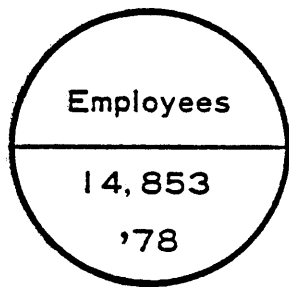
- ex.
- Vending
machines
 - Air
Conditioner

6 LARGEST ELECTRICAL COMPANIES (BY SALES)

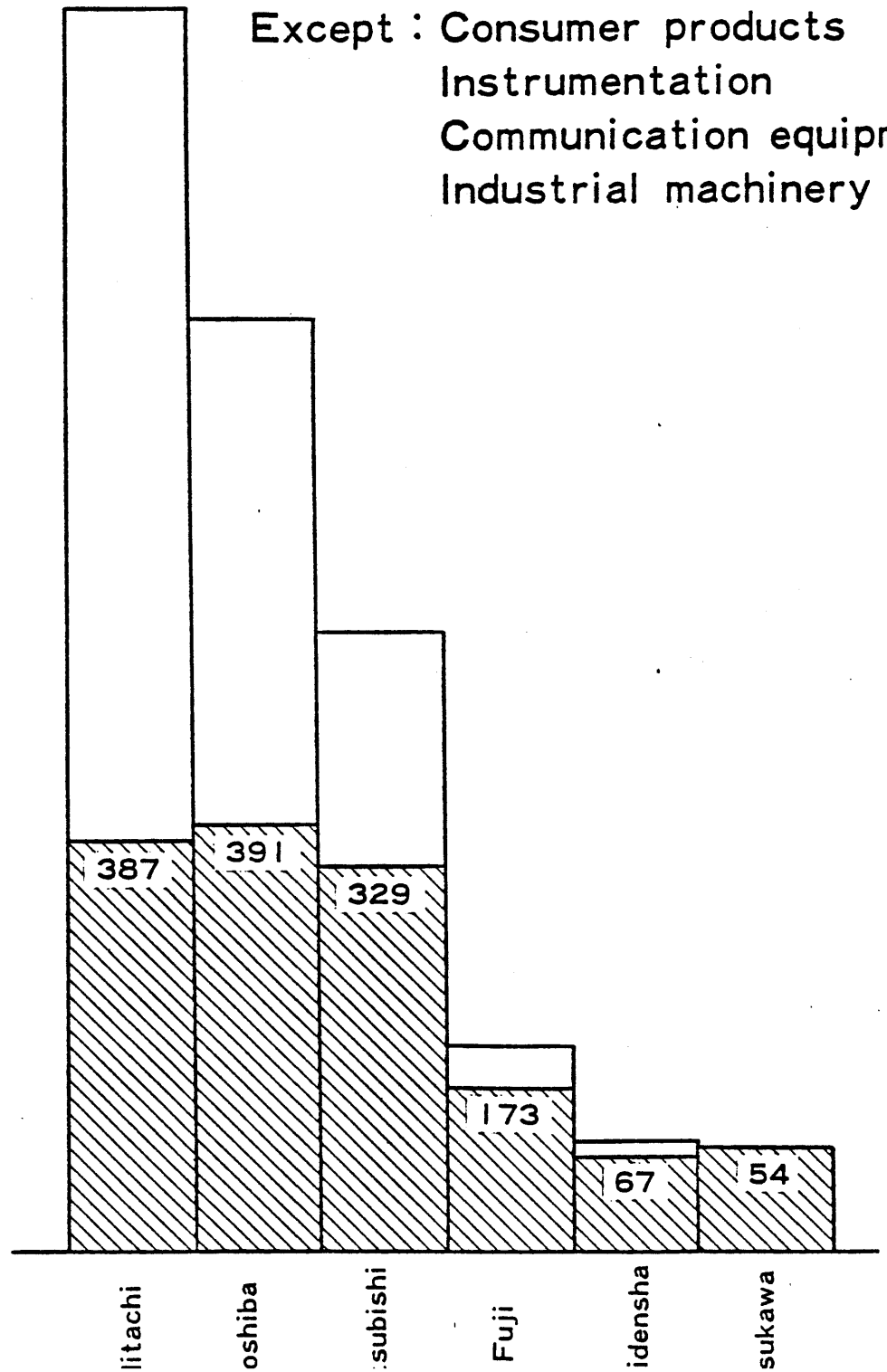
 Electrical Business

Period 4.1977~4.1978

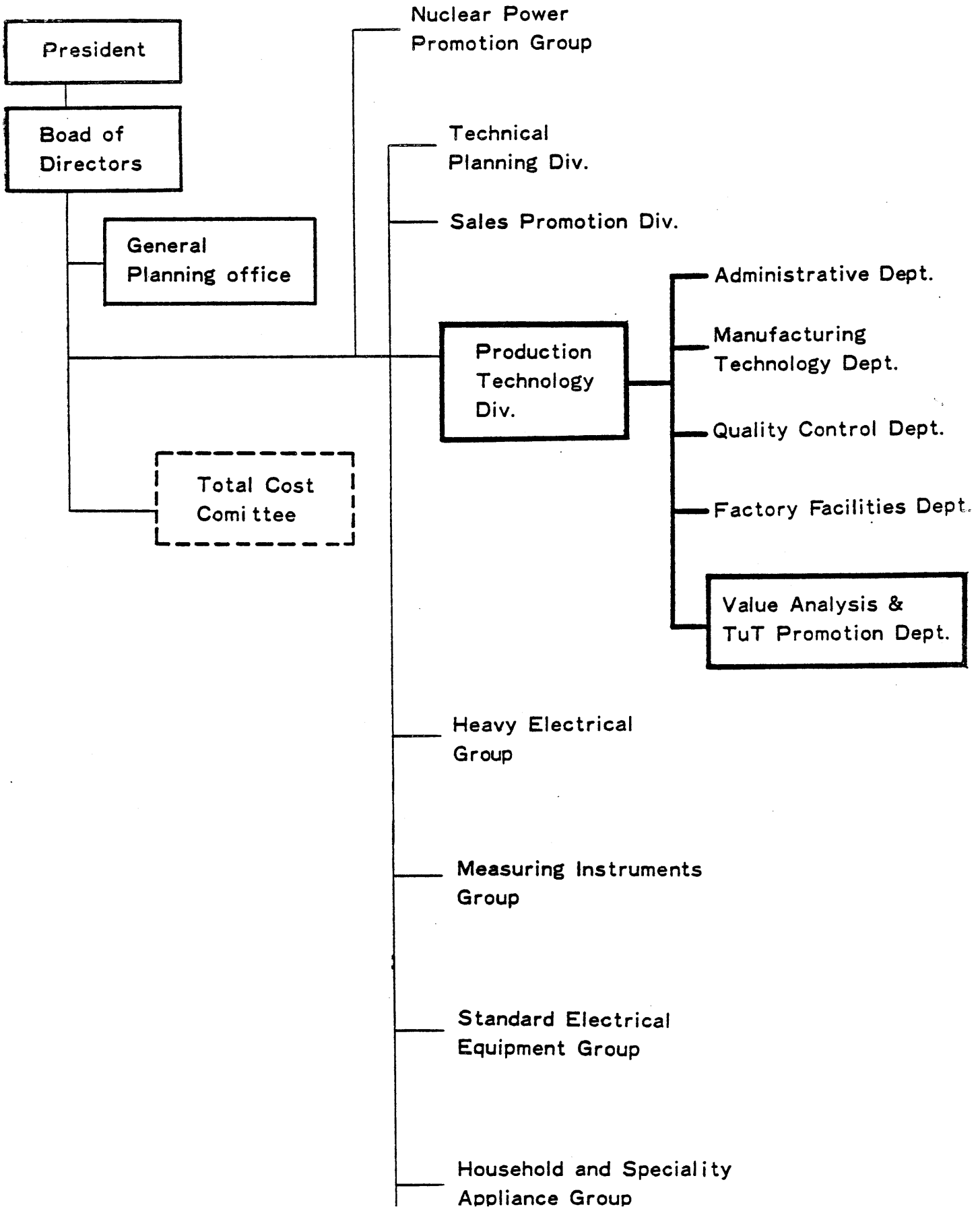
Except : Consumer products
Instrumentation
Communication equipment
Industrial machinery



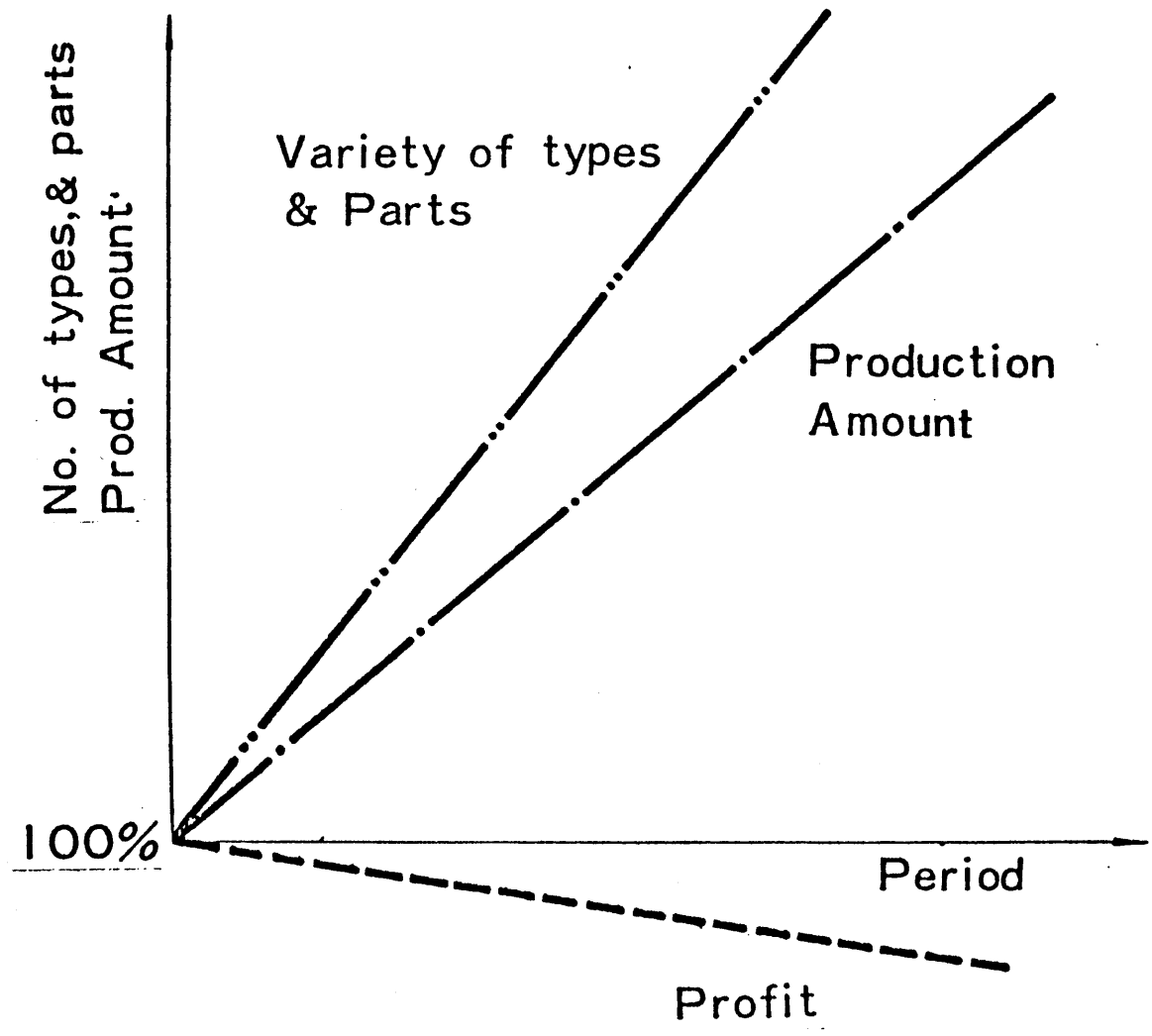
Millions of Yen



ORGANIZATION

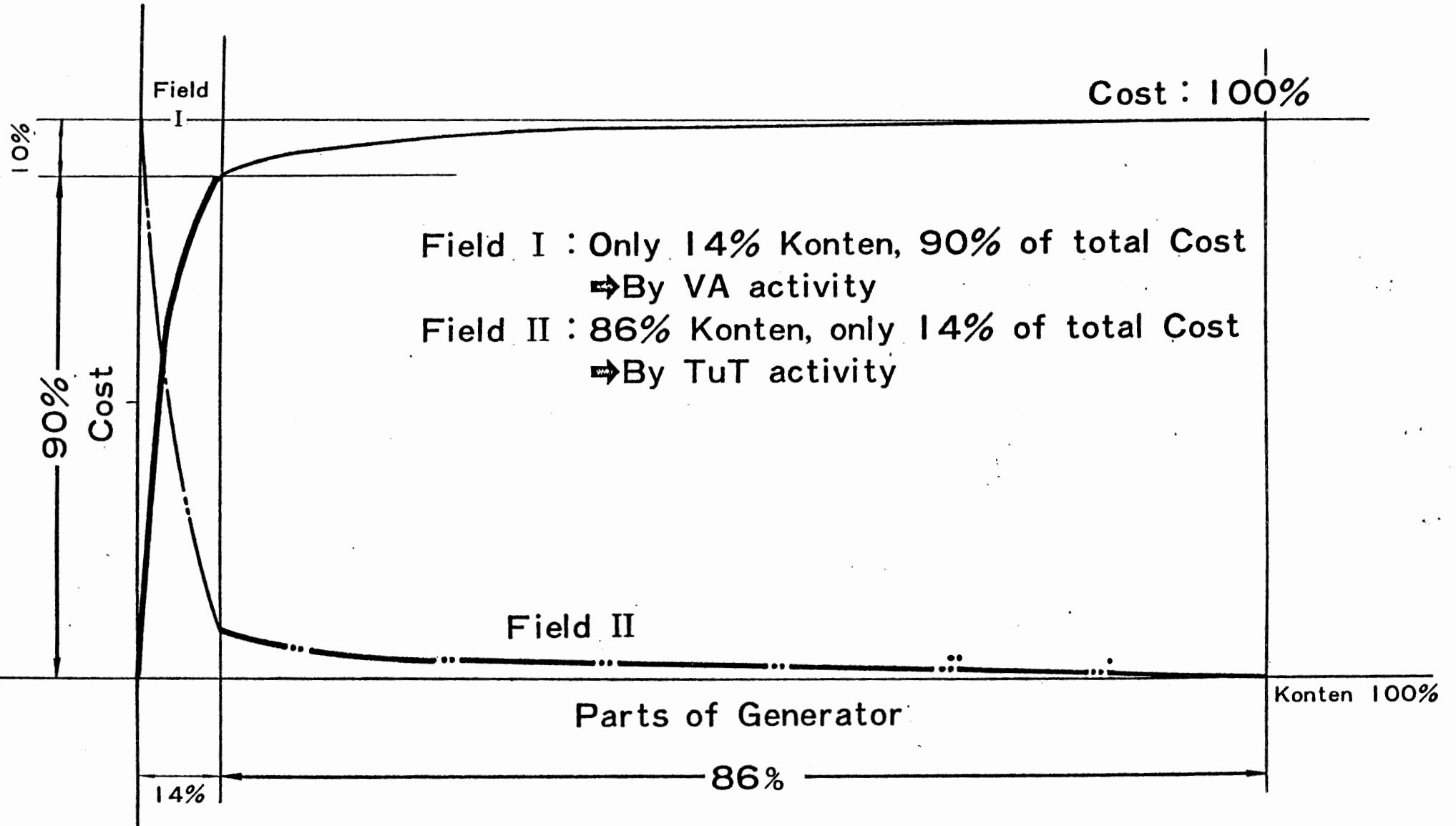


WHY MUST WE PAY ATTENTION TO TuT ?

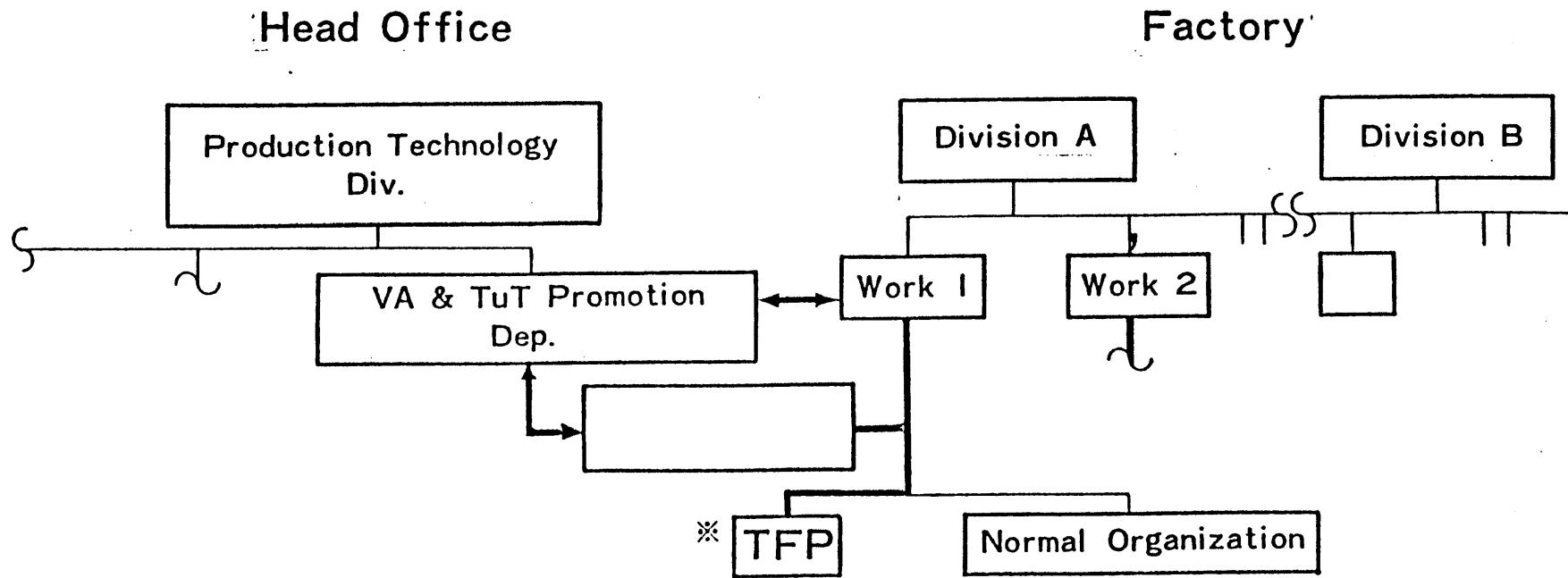


COST STRUCTURE OF WATER TURBINE GENERATOR

(Direct material)

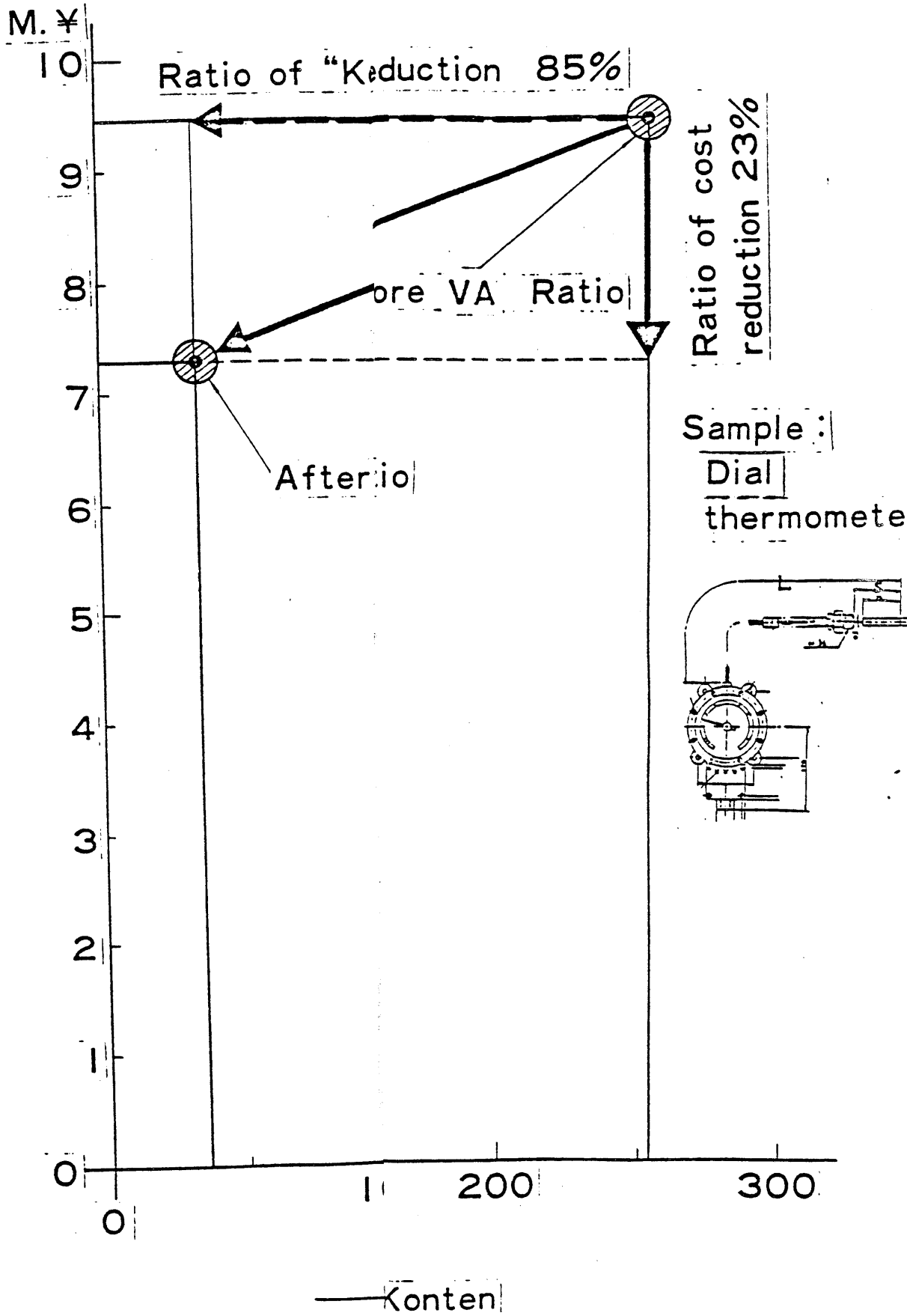


VA AND TuT ORGANIZATION



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Project

EXAMPLE OF RATIONALIZATION



Ex. 2-2

EXAMPLE OF **VA** **TuT** RATIONALIZATION (DC GENERATOR)
Cost reduction and Konten reduction by TuT

