A study of a new production control system

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In a newly developed production control system. a safety control ought to be included as a means of ensuring a more rational control system for achieving efficiency. Such a system does not hold any meaning in itself unless accompanied with appropriate ways to make it practicable.

A firm would have a number of function groups. Each of these groups would have specific functions or duties to perform. Their production activities would be planned at the level of departmental management.

The planning will take such forms as production, quality and safety planning, and so far as each department would order the line from its own standpoint, scientific production activities could not be expected. All the programmes must, therefore, be integrated and coordinated by a supervisor.

1. Introduction

Production factors are often denoted with 3Ms meaning man, machine and material. To this two more Ms are sometimes added to include money and minute. Either of these is the conventional approach in studying production control.

In production activities, however, there are work units that may be called work centres, the composite system of which may be what is known as the process. Improving the efficiency of production, therefore, may become more rational and practicable when the process, that is the system of work centres, is subordinated into a new control system.

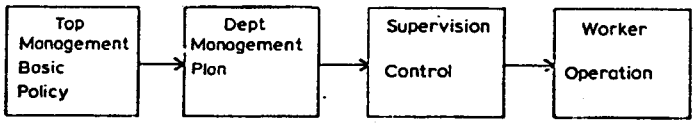

Figure 1. Function group.

2. Production activities and safety control

Production activities will be able to achieve their functions by means of scientific 5M control factors. These 5Ms are summarized into two aspects:

Production activities { Subjective phase of production—Labour—Operation
Objective phase of production—Materials—Work centres

Operation and work centres are usually used as a composite form in the production field. However, operation should be separated from work centres in order to use control techniques.

Production activities are improved by developing such control activities as: (1) work-line organization; (2) lay-out of production facility; (3) arrangement of labour. If production activities are to be carried out as stated above, they should be studied in respect of attaining their goal in relation to the plan. If production control emphasizes process only, as shown in Fig. 2, it is hard to improve the efficiency of all production activities. Therefore, rationalization of production activities has been developed by means of quality control, as shown in Fig. 3.

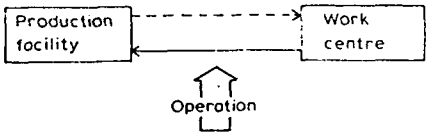

Figure 2. Production activities through process system.

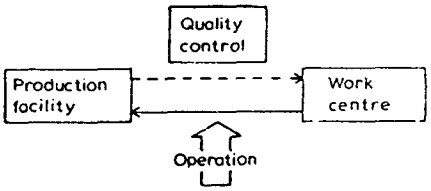

Figure 3. Production control through quality control.

It has been a desirable innovation of control techniques that quality control be applied to production activities. Here, quality control is normally performed by control techniques. Quality controls are unable to be related to production activities in an exact sense, regardless of particular work centres or a composite process. However, quality control which contributes to the improvement of production activities pursues only the outcome of production activities, particular or composite. Production control is, therefore, strongly demanded in analysing the course of production activities.

Safety control is the new control technique which can analyse, examine the course of production activities, and correct possible defects. Safety control is able to make a production activities system, as shown in Fig. 4. This new control technique increases efficiency in three ways: (1) rational organization of work-line; (2) analysis of the course of production activities; (3) observation of outcome of production activities.

The operations phase of production activities should be studied, as a precondition, if we are to see the course of production activities as part of a production control system. Operations are generally in the area of operations management, and operations management is usually an object of the personnel phase. (The latter, personnel, phase of production activities is not usually dealt with in Korea.) In fact, they are interested in modernization of production facilties but the control technique of production activities is not applied in the personnel phase.

Modernization of production facilities has been appraised by machine ability only.

Briefly, good operation management is summarized as follows:

(1) The case of operation; this can break down operations, organize special duty, utilize technician's function, and calculate man-hours scientifically.
(2) Accomplish production efficiency to the maximum; develop labour efficiency through decreasing fatigue by making use of efficient operation times.
(3) Equalization of product quality; by developing operation conditions, carrying out standardization and improving product quality.
(4) Decreasing product cost; by developing yield ratio, and cutting down production cost through minimizing indirect cost.
(5) Labour efficiency; eliminate unsafe actions and the possibility of industrial accidents.

How to utilize labour ability is the key to improvements: (1) willingness of labour; (2) efficiency of production; (3) decreasing of production cost; and (4) decreasing industrial accidents. Industrial safety is dependent upon the degree of participation of labour.

3. The establishment of a safety control system

Unsafe behaviour and unsafe circumstances, etc., are usually considered. Safety activity will realize its function by understanding the production activities under all possible circumstances. The new function of safety control is shown in Fig. 4.

A safety control system cannot be established unless there is a managerial function of safety control, combined with field function of it (Fig. 5). Safety control as considered above, may not be taken as part of the production activities but only the control of audited statistics emphasizing the economic value of such behaviour. That it is the moment when safety control should be

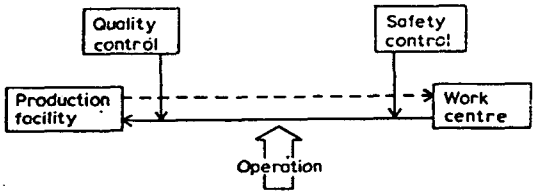

Figure 4. Production control system with safety control.

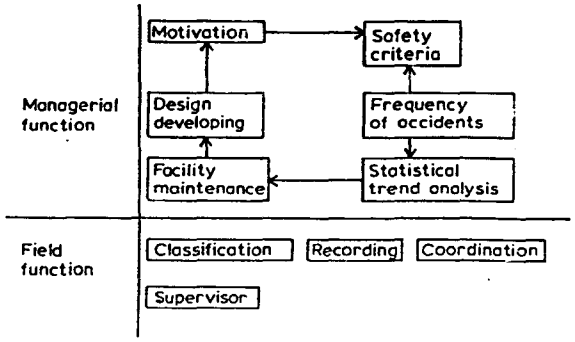

Figure 5. Managerial function in safety control.

considered in terms of the economic value of them. Only when safety control is viewed within production activities, can its function be entirely realized. When an industrial accident happens, interruption of production, increase of production cost, decrease of product quality, necessarily follow. It is most important to take into account that the production plan depends more directly upon the lack of industrial accidents than demand pattern.

In production activities, it is impossible to build up the production plan without safety control. Without a production plan, cost-benefit analysis is not possible, nor is the relative analysis on productivity. In a static conception, we cannot find the time value. This means, therefore, that new safety control systems, which should be examined as part of the production process, must be established.

Until now, safety controls had been functioning in response to statistics of industrial accidents, therefore, most workers in factories have not been concerned about the value in the formation of safety controls as shown in Fig. 6. In establishing new safety control systems, safety control, which with time having received managerial acceptance, along with simultaneous control of the field phase, and establishing safety of the operatives, should be dealt with on a preferential basis. Without this new view of safety control values by field labour, safety control hardly accomplishes its function and goal.

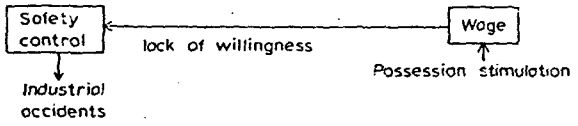

Figure 6. Decrease of safety motivation.

4. Problems on safety control

Let us consider some problems of safety control in respect of managerial techniques.

(1) *Improvement in recognition of safety control.*

All members of the business must improve their concept of safety control. If the function of safety control has been well executed in the factory, as shown in Fig. 7, its effects shall be improved. The method and function of safety control will be judged by their application.

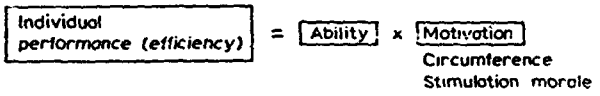

Figure 7. Decision of individual outcome by motivation.

(2) *The function of safety control is only well accomplished by reasonable organization for it.*

If we functionalize our task and part-composition simply, as was the past system of safety control, shown in Fig. 8, we cannot achieve our production goal. Now, if we adjust the business organization from vertical specialization to horizontal, we can then expect an increase of productivity.

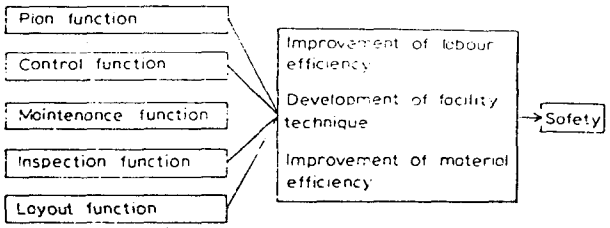

Figure 8. Rationalization of safety control system.

(3) *The establishment of a committee on safety control.*

(1) The committee prescribes a method, disposal and order through discussion by all members of the business.

(2) All problems which are proposed through discussion must be arranged in order of frequency so that priorities may be set.

(3) An improvement target is made through classification by frequency.

(4) In order to achieve the initial proposal for improvement, scheduling must be arranged and fixed.

(5) Ensure that all members of the business recognize immediately and concretely the initial proposals for improvements.

(6) Undertake improvement proposals item by item.

(7) The safety controlling division must always check and guide performance and clarify all matters.

(8) A free discussion on performance must be organized at regular intervals, held twice a month if possible.

(9) The second improvement proposal must be reviewed and then executed in the order of the above.

(10) For marked improvements by executing the safety proposals, citation of excellent sections or persons may increase incentives.

5. Application of safety control circles

A safety control plan must be established as shown in Fig. 9.

Although, as above, a safety control plan is established, if the plan is not carried out in the factory, the plan is of no use. Good results can therefore be expected from the application of safety control circles. For this purpose, the contents as shown in Fig. 10 will be good if they can be realized.

Motivation must, therefore, be applied which can imrove value-judgement in the field.

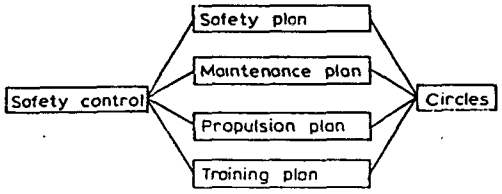

Figure 9. Diagram of safety control system.

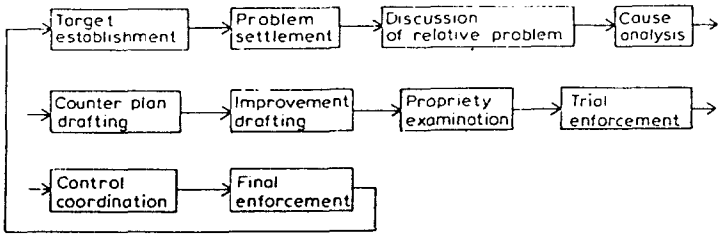

Figure 10. Contents, process of safety control circles.

6. The task of safety control: conclusion

Unless safety control is developed as a total company activity, it cannot be expected to obtain a significant effect. The safety problem is not limited to a specific division or job. Since the whole procedure of business activities has to be integrated into safety control, its movement should be developed total company wide. But the leading role in the safety control movement in business is given to field managers, supervisors, more concretely section leaders. Unless these field executives do their duty, no results can be expected. As Fig. 11 shows us, the policy of a business is prepared by top management. The decisions are composite matters of business, and department organization has to perform those things that the top level decides. Each department of a business plays a part in planning organization to perform the business goal. So the business success will largely depend upon how far the department organization can achieve the supreme target for itself.

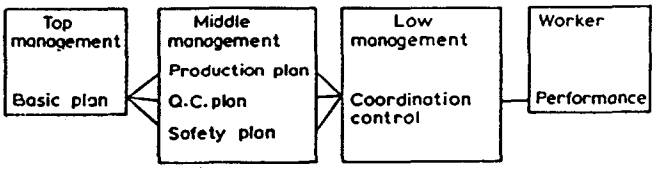

Figure 11. The process of safety control.

Various kinds of plan which are set up by various departments of business on the basis of their situations and superiority cannot be used in the field unaltered Therefore the department plan has to be coordinated as far as possible so it can be applied to the field. The supervisor has to be responsible for this function. Although many businesses have supervisors, their function is without power and responsibility in practice, so control techniques are seldom conveyed to the field through them.

Power and responsibility for a business has to be delegated to the supervisor. The business must also have section heads in fact as well as in name. If a business has 100, 500 or 1000, workers, it does not mean the unit of production activity but the number of workers registered. The unit of production activity is the number of members of a section that a section head controls.

In an extreme case, the number of production workers is not above the size that a section head can control. The success and failure of production activity in business will wholly depend on the section head capability and the degree of power delegation. The success of safety control will, therefore, be decided by the above facts.

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