17 Chains of stocks

Particularly in large concerns, lengthy and very ramified chains of stocks are encountered. Consequently, it is often desirable when considering a certain stock point to take into account the fact that several other stock points exist either in parallel, or in series with, the particular one under consideration.

Not much satisfactory theory is yet available in the sphere of chains of stocks. Some points will be discussed in this chapter, the importance of which has already been established.

17.1 Parallel stocks

Only the case of intermittent production will be discussed. Cases arise where several points (e.g., service depots) order from one central point (e.g., a factory) and where it is preferred that orders from the various branches are placed at the same time. There are then no separate order levels for each branch; the moment of re-ordering is, however, dependent on the total stock situation. For two stock points this could be, for example, as shown in Fig. 60. In this graph a certain stock position is represented by a point. The order is placed when this point falls on the order curve.

Such a system is described by P. R. Winters.*

The simplest system is one where all branches are treated as a whole and the orders are therefore only placed when the total of available stocks in all branches falls below a certain minimum. For the situation described in Fig. 60 the order curve would be a straight line at an angle of 45° (see Fig. 61).

Fig. 61. Order curve if both branches are regarded as one.

The practical execution of this system, as in situations described earlier, could be carried out using a \((B, Q)\), \((s, S)\), \((s, Q)\) or \((B, S)\)-rule.

In some cases the assumption is made that all the stock points may, in practice, be regarded as one because they will help each other in the event of any one of them running out of stock.

It must constantly be remembered in this sort of situation that the decision as to how the replenishment batch ordered is to be distributed among the various stock points need not be taken until the factory has completed production of that particular batch.

A dangerous situation can arise when in the situation described above, the central stock point does not manufacture for stock and has insufficient flexibility. Because the total orders from the several stock points will fluctuate in size, long and unreliable delivery times may develop.

From the earlier discussion on the safety stocks the following statement should be recalled:

- unreliable delivery times on the part of the supplier lead to large safety stock held by the customers.

Two golden rules follow from this statement:

1. deliver in time (i.e., at the time agreed).

   If delivery to several customers is made from a single central point, it is better, recalling the law of large numbers, to carry centrally the collective uncertainty of consumption during the factory delivery time, and to serve the customers readily from that central point. This gives rise to the second golden rule:

2. deliver quickly and promptly (i.e., aim at agreed short delivery times).