THE METHODOLOGY OF CALCULATION THE OPTIMAL LEVEL OF PRODUCTION CAPACITIES INVOLVED IN SCM

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Abstract

Supply Chain Management offer long-term stability for business volumes confidence contractual relationship and the possibility of greater efficiency and optimization of the entire supply chain. On the other hand, it follows the seasonal peaks and dips of orders by customers (which is due to optimal management of adverse event). At the same time, while a clear definition of the rules sets, but also limits the possibility of regulating the system. This compels us to address the appropriate setting of customer portfolio, the optimal level of customer engagement in SCM system, and finding alternative ways of regulating the system. SCM system brings the risk in case of loss, leaving the customer with a relatively high utilization of production capacities - resources in a supply undertaking. It is therefore necessary to determine the level of risk, and the volume capacity and commitment to the SCM system, and define management options, in case of loss of the customer within the SCM.

Keywords: SCM, production capacity, capacity regulation

1. INTRODUCTION

Supply Chain Management offered, as is clear from the theory [1, 5, 6], compared to the traditional system of relations between enterprises number of advantages. But if we want comprehensively define the optimal level of production capacity of the company use for SCM, we must consider several factors. They concern such as customer, product as well as logistical and capacity. At this stage, we consider the following to be key factors:

- SCM is usually associated with long-term contractual relationship, which regulates the length of the contract parameters and rules of cooperation, and thus provides certainty of orders during this period [1,11,12]
- The control system SCM is thus determined and limited by the terms of the contract, which is on one hand an advantage on the other hand, while limiting
- Custom content partners from SCM in case if more customers are concentrated into one segment, bringing in a certain period overcrowding and other lack of orders - it is therefore of a seasonal nature [10], which is necessary to regulate with contracts from other customers not involved in SCM.
- It is usually the major customers (European resp. global multinationals), which in the case of loss of any of them can mean for company a serious problem to quickly replace such a failure [10]
- It is necessary to take into account a gradual build positions at the customer, which in the initial phase works on the traditional ordering system, and gradually with the increasing volume of cooperation will be interested in the introduction of SCM [2]
- SCM helps to build long-term relationships based on such rules, as well as on personal knowledge, has greater durability than traditional methods of trade

Due to the fixed setting conditions brings in custom logistics option for implementation of SW support to ensure greater efficiency and transparency of the process of trade generally.

2. METHODOLOGY SOLUTIONS AND APLICATION FOR CHEMIX COMPANY

Supply Chain Management therefore offers long-term stability of the orders volumes sure the contractual relationship and the possibility of greater efficiency and optimization of the entire supply chain. On the other hand, it follows the seasonal peaks and dips of orders by customers (which is due to optimal management of adverse event). At the same time a clear definition of the rules, while at the same time sets limits the possibility of regulating the system. This compels us to address the appropriate setting of customer portfolio, the optimal level of customer engagement in SCM system, and finding alternative ways of regulating the system.

SCM system brings the risk in case of loss the customer with a relatively high utilization of production capacities - resources. It is therefore necessary to determine the level of risk, and the volume capacity and commitment to the SCM system, and define management options, in case of loss of the customer within the SCM.

If we look at the possibility of regulating the whole production system we can be stated as follows:

- For customer in the SCM must be produced in accordance with the contract terms and conditions (can not be rejected)
- Customer involvement to SCM inform ahead with forecasts of production /at 8 to 12 weeks/, with the customer needs (we can provide pre-production) [9,10]
- In the small customers is greater freedom given a possibility of agreement, about earlier production or the postponement the date of delivery from the time of seasonal peaks /are not bound by long-term contracts/.

In agreement with the customer it can thus be realized as production in advance and also later

Both types of cooperation are, regulatory provision to be quantified due to the size of such a shift in time of the possibilities.

On following chart (Fig. 1) can be seen curves of available production capacity / KM /, actual capacity utilization / PKN / capacitive demands of customers involved through various forms of Supply Chain Management (KNSCM), as well as production capacity, use small customers (KNMZ) .

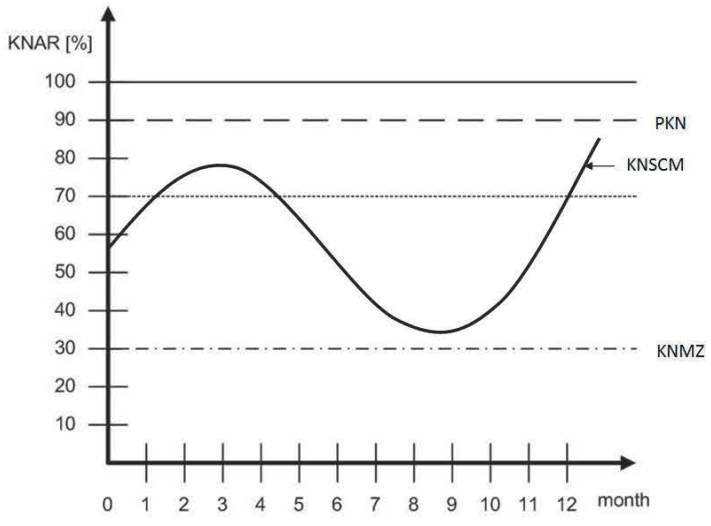

Fig. 1 Capacity utilization through SCM, MZ, total

Capacity demands:

Required capacity entitlements PKN

$$PKN = KNSCM + KNMZ$$

Regulation deviation with the use of Supply Chain Management through estimate calculation Δ KNSCM capacity requirements, as follows:

$$\Delta \text{ KNSCM} = \text{MAX} - \text{MIN}$$

After substituting the values achieved for the company.:

$$\text{MAX} = 70\%, \text{ min} = 40\%$$

$$\Delta \text{ KNSCM} = 70\% - 40\% = 30\%$$

Is the approximate value of the required regulation reserves to compensate for seasonal KNSCM.

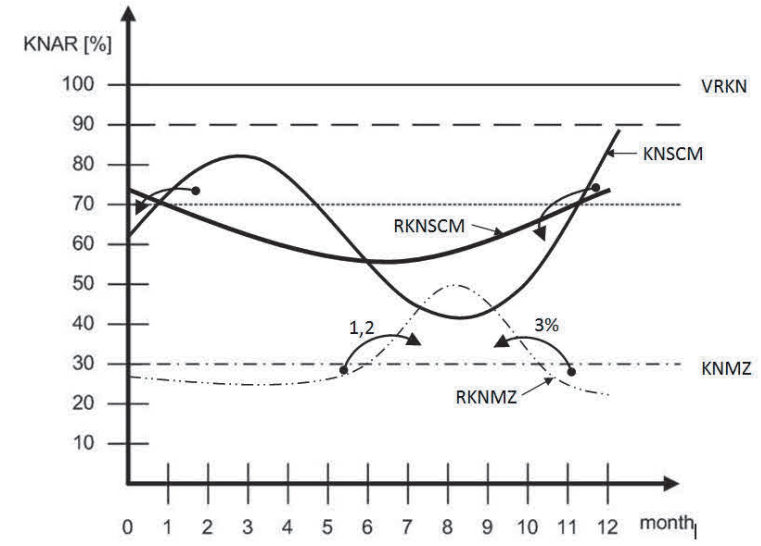

Fig. 2 Graphical representation regulatory options

Difference of capacity requirements can be derived with consideration of:

KNSCM Δ - difference maximum and minimum capacity requirements

RKNSCM- control capacity requirements through SCM

RKNMZ - regulation of small capacity requirements of customers

VR - self regulating system (maintenance planning, personnel work, short-term use of reserve capacity)

$$\Delta \text{ KNSCM} = \text{RKNSCM} + \text{RKNMZ} + \text{VR}$$

In the SCM system, we know forecast with 8- 12 week-ahead/what will be the customer needs/. We assume that 50% would like to know in advance theoretically produce for stocks. We have produced the goods in advance for about five weeks. If through SCM it is bound for example. 70% of production capacity, and in the real working 48 weeks

$$70\% / 48 = 1.4\%$$

production volumes for the week is produced through SCM, so if we think about five weeks

RKNSCM = 1.4% * 5 = 7% (to Stock)

Out of the total 30% we know just 7% to solve through pre-production in the SCM system. To regulate by means of small customers and its own regulation remains

Δ KN - RKNSCM = RKNMZ +VR

Statistical profile "small customers" can be defined:

• A large number, approximately 400 companies

• Statistically balanced contract throughout the year

• Small customers now constitute about 30% of production, which is by about 6% of the total production volume per week / 30% / 48 weeks

We assume ,that with this group of customers, we are able to agree to the following conditions:

a) Move the duedate/ fig 2/ two weeks later it is adjustable

RMZ1 = 2 x 0.6% = 1.2%

b) The performance of the contract is five weeks earlier adjustable

RMZ2 = 5% x 0.6 = 3% /

Regulation reserve of small customers is calculated as follows:

RMZ = RMZ1+ RMZ2 = 1.2% + 3% = 4.2%

KNC = KNSCM+ RSCM + KNMZ + RMZ+ VR

Self-regulation is a reduction in capacity through the options:

a) IF the summer vacation is two weeks. From 100% of the production volume, production volume for two weeks:

100/48 = 2,08 2,08x2 = 4.16%

b)Personal measures stoppage of work by employees for temporary employment relationships-about 0.6%

c) Planned maintenance about 1%,/ Figure 2 /

VR = 4.16 + 0.6 + 1 = 5.66%

Provided that:

VR = 5.6%

RMZ + VR = 10% = 1.3 KNMZ

KNC = KM = KNMZ+ 1.3 KNMZ + RSCM+ KNSCM

KM = KNSCM +RSCM + KNMZ+ 1 / 3KNMZ

The highest need for regulation is in KNSCM =KNSCM MIN

4 / 3KNMZ = KM - RSCM - KNSCM MIN

KNMZ = ¾ [KM - (KNSCM MIN + RSCM)]

KNMZ= ¾ [90 - (40 + 7)] = ¾ [90 -47]

KNMZ = 32.25%

The minimum value of the share of small customers the capacity limits is thus 32%, a regulatory reserve for regulation of seasonal fluctuations KNSCM. It follows that the capacity demands of Supply Chain Management KNSCM should move at a maximum of 68-70%.

3. CONCLUSION

Application of SCM with selected customers gives the company the benefits of long-term stability data on production forecasts for several weeks, the possibility of temporarily switch production "for example", larger batches etc., but if thru SCM businesses involved high percentage of production capacities, especially with a small number of large customers, there is a problem with the termination of cooperation with such customers replacing of orders, but also the problem of the seasonality of their requirements that regulate has to company particularly with small customers and internal reserve .this article offers a methodology for how this could be addressed, and what proportion production capacity can be committed with customers through SCM as to be hard to adjust to fluctuations in seasonality.

The methodology was applied to the company chemix.name the company is fictitious to protect the information.

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