

QUALITY OF MANUFACTURE PRODUCTS IN THE CONTEXT OF CUSTOMER SERVICE

Dominika STRYCHARSKA, Marzena OGÓREK, Mateusz NOSAL

Politechnika Częstochowska, Wydział Inżynierii Produkcji i Technologii Materiałów, Katedra Zarządzania Produkcją i Logistyki, strycharska.dominika@wip.pcz.pl

Abstract

All logistics activities both in the field of distribution logistics and in the logistics of customer service are closely related to the customer to the ability to satisfy his needs and expectations. Analysis of the level of customer satisfaction in enterprises is treated as a valuable source of knowledge about the degree of customer satisfaction from the company's operations. The basis of any quality management system is to reveal and improve the resulting nonconformity within a company. In accordance with the principle 1-10-100, the costs of the complaint are many times higher than they would in real terms and also result from the loss of trust and reliability of clients. For this reason, each complaint should be treated exceptionally and analyzed in detail in order to eliminate the cause of its creation experience. The purpose of this article is to analyze the quality of the offered products and the course of the complaint process, as they significantly affect customer satisfaction.

Keywords: Distribution logistics, customer service, quality, complaints, customer satisfaction

1. INTRODUCTION

In the modern world, one of the most important criteria for the functioning of enterprises and their assessment by customers is quality. Issues related to quality should be treated by management with particular care in every area of the company's operation - also in the context of logistics. Therefore, the quality management process and logistics must be linked to each other in such a way that these aspects are mutually compatible and merged.

The distribution logistics subsystem is responsible for coordinating all the flows and activities aimed at physically delivering products to the customer [1]. The tasks and functions of the distribution logistics subsystem concentrate mainly on operations and warehouse manipulations, packaging and delivery of physical goods to final purchasers by its own transport or through an external provider of logistics services [2].

Customer service is one of the most important areas of business management. The position of the company on the market depends on the effectiveness of actions that are aimed at satisfying the clients' needs both in terms of products and services rendered. Logistics customer service is primarily associated with transactional activities, but it is also present in post-transaction activities. Handling complaints and grievances should not be treated as a necessary evil. It should be noted that a well-served customer in the post-transaction service is often more loyal than the one who was immediately satisfied with the acquired goods [3].

The purpose of this article is analysis of quality of products manufactured and procedures that are used in the analyzed undertaking to reduce the number of noncompatible products which are going to the ultimate purchaser and proceeds in the situation when the customer reports the claim. The 8D method was used to verify the complaint.

2. DISTRIBUTION LOGISTICS

In terms of logistics, E. Gołemska defines distribution logistics as an integrated process of planning, organizing and controlling streams of goods and related information, whose task is to provide the right goods in terms of the type, quantity and quality to the right place and at the right time, at the lowest possible costs [4]. The subject of the logistics of distribution processes is, therefore, the movement of raw materials, materials

and finished products from the places of their manufacture or production to the user or consumer. It covers all the activities that are necessary to supply the customer with finished products. As follows from the definition of distribution logistics, its purpose is to ensure product availability for the customer, according to his preferences, at the lowest possible cost. In a general way, these costs are defined as costs arising between the moment the product leaves the production facility and delivery to the customer's door [5, 6].

Distribution logistics integrates all the physical processes and streams in the sphere of marketing and sales into a single management system whose main task is to minimize sales costs while satisfying clients' various needs [4]. Due to the importance and economic significance of decisions regarding the distribution and sale of final products, they are included among the most important strategic decisions that affect the company's results. The scale and nature of logistics distribution processes in an enterprise are varied and depend on [4]:

- the type and nature of the enterprise;
- the subject of the company's activity;
- the market competitiveness of the company and its market position.

3. LOGISTICS CUSTOMER SERVICE

Logistics customer service is one of the most important concepts of modern logistics. All logistics activities are closely related to the client, with the ability to meet his needs and expectations [7]. Positive and lasting interactions with buyers are often the result of customer satisfaction with the quality of service provided to them, which is reflected in the company's profits [8].

M. D. Dobrzański defines logistics customer service as all the necessary activities related to receiving, preparing and filling orders, while at the same time supervising its correctness and intervention in the event of errors in order to compensate for damage. Logistics customer service is also the reliability of supply of products to buyers, in accordance with their requirements. The whole can be defined as an activity that includes all business areas whose aim is to satisfy customers while realizing the objectives of suppliers [9].

The elements of logistic customer service (so-called features) can be called those parts of the service that are of particular importance for customers, but the weight assigned to them by customers may change depending on the market segment, type of products, distribution methods or size of competition [8].

Customer service is the object of interest in many areas of the company's operation, however, from the logistics point of view, we can analyze it with its division into four main elements [10]:

1. time (control of delivery time, transfer of orders, preparation of orders, transport time);
2. reliability (inventory level and costs of their exhaustion, complaints, proper filling of order);
3. communication (information about the order between the seller and the customer in both directions);
4. convenience (flexibility).

The elements of customer service in logistics can be divided due to many different criteria. One of the most popular and most often distinguished is the division, whose criterion is time. We can identify three phases here: pre-transactional, transactional and post-transactional elements [11].

Enterprises choose to provide customers with the quality of manufactured products, professional service and a developed after-sales service. For this purpose, products are inspected at all stages of manufacture. The low level of quality of manufactured products increases the probability of a complaint which according to the 1-10-100 principle is very costly for the company both financially and image.

Despite the fact that the products are currently controlled on the market, there are defective products, which customers are dissatisfied with and then they can advertise the product. Complaints are most often the result of [12]: inadequate product quality, unsatisfactory customer service level, price differences in relation to the



price at the time of ordering, quantity differences in the batch delivered, delivery of a different product than ordered or delivery delay.

4. CUSTOMER SATISFACTION AND PRODUCT QUALITY

Customers are a very important factor in all organizations. Unfortunately, in terms of quality, performance or service, not all organizations are able to fully adapt their business to the needs of their clients. Therefore, every company should be aware that improving the quality perceived by customers is not a matter of choice, but a requirement that determines the survival of the organization [13, 14].

Organizations depend on their clients and therefore it is recommended that they understand the current and future needs of the client, meet his requirements and make efforts to exceed his expectations. [15].

Logistics customer service is related to transactional activities as well as pre- and post-transactional activities. One of the most important activities in the sphere of customer contacts is the handling of complaints and returns. For it is not only selling products, but also activities undertaken in connection with comments appearing after the sale that have an impact on customer satisfaction [3].

Among the reasons for customer dissatisfaction, the poor quality of products is mentioned in addition to errors in their service strategy [3]. And it is the satisfaction of the client's needs that has a huge impact on the competitive position of the company. Therefore, one should strive to eliminate products that do not meet the expected properties, e.g. by monitoring the production process, quality control of manufactured products and analysis of the causes of noncompliance. These processes are focused on meeting the expectations of the company's clients, as this satisfaction is one of the most important elements of customer service [7-9].

In order to maintain the expected level of product properties, nonconformities should be identified first. **Figure 1** presents the data from 2017 regarding the production volume and the amount of produced nonconforming products in the analyzed production company (**Figure 1**).

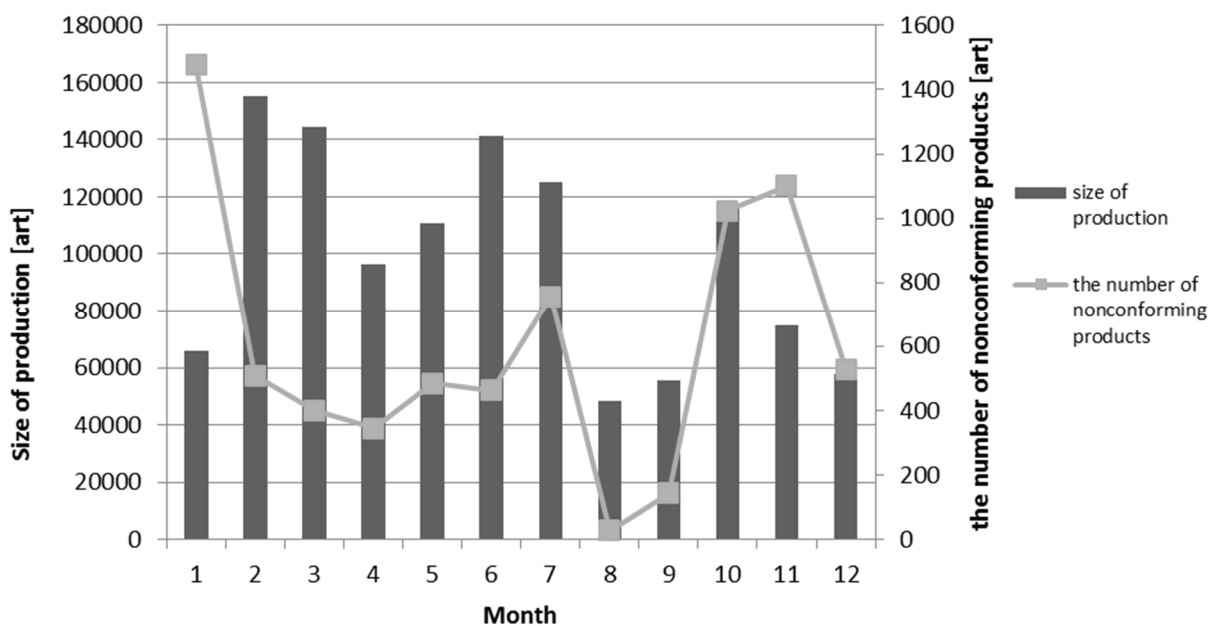


Figure 1 Size of production and the amount of nonconforming products

Based on these data, it can be concluded that in 2017, 1,192,802 electric beams were produced, and 7,273 nonconforming products were detected. The largest number of electric beams was produced in February, March and June (on average over 140,000 units), while the most nonconformities were detected in January,



October and November (on average over 1,000 items). The percentage distribution of the analyzed data is more objective to analyze the quality level (**Figure 2**). As can be seen from the data included in **Figure 2**, the share of nonconforming products in the total number of manufactured products is at the level acceptable for this type of production and amounts to 0.6 %. The most nonconformities were revealed in the winter months (October, November, December, January).

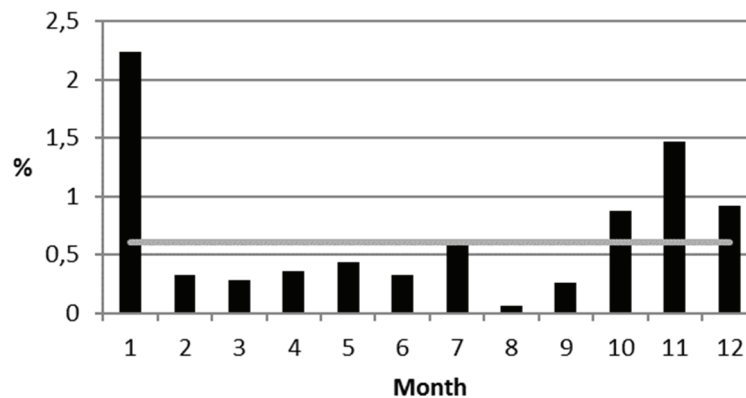


Figure 2 Percentage of nonconforming products in total number of manufactured goods

In the analyzed company there are 43 types of nonconformities (T1 - T43) occurring in the production process. The nonconformities arising in 2017 classified according to these groups, allowed us to conclude that 25 types of nonconformities occurred in the analyzed period.

The main types of nonconformities that occurred in 2017 can include T1 nonconformities - others - in this category, approx. 95 % of nonconformities are products that have inappropriately joined (glued) plastic components that are worse in periods of low temperatures (the most analyzed nonconformities were detected in January 2017) (**Figures 1, 2**); T2 - poorly fixed cable and T3 - lack of one of the components of the finished product. The company should first of all introduce improvements that will eliminate these three types of nonconformities, as they in the following months of 2017 constituted about 45 % of the total number of nonconformities.

The largest number of nonconformities arising in 2017 is due to human error. This is largely related to the high turnover of employees that takes place in the company, which is due to the fact that they are inexperienced and do not have sufficient competences. In addition, they are employed for a trial period, which often results in a lack of motivation to work, as well as a lack of diligence in performing work.

In this enterprise, in accordance with the adopted strategy, employees are treated as internal customers, i.e. that each of them is the recipient of products provided by other employees, therefore, it is necessary to strive to satisfy their requirements as fully as possible. In addition, each employee is convinced that it is his work (task, process) that is the most important in the whole process, the end result of which is a finished product, which is an electric beam.

In the studied facility in accordance with the existing ISO system, at each stage of the production process the product is regularly inspected in terms of maintaining the technical parameters specified in the documentation in order to detect nonconformities as early as possible.

The designated quality control points (**Figure 3**) are aimed at the earliest possible detection of nonconformities to reduce the costs associated with occurring errors and in addition, the nonconforming product will not be delivered to the customer. However, if this happens, complaints are dealt with as diligently as possible, bearing

in mind above all to obliterate the negative impression about the company and show that the customer is the most important for us.

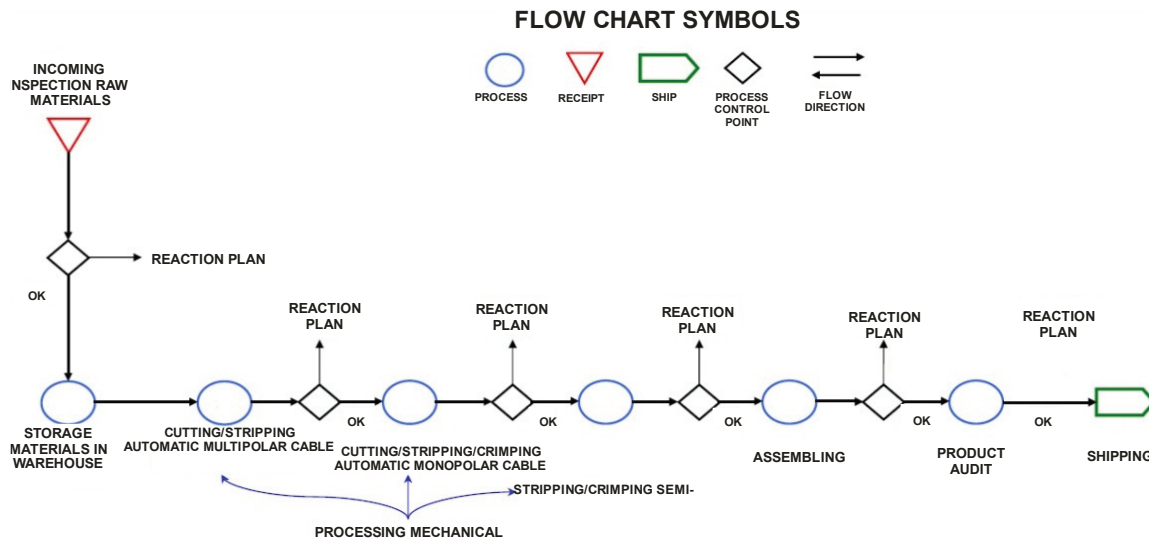


Figure 3 Block diagram of production process occurring in analyzed enterprise

In the analyzed company in 2017 there was one complaint. In this enterprise, the 8D method was used to verify the complaint, as it allows correct identification of the cause of the defective product that was delivered to the customer and implementation of improvements in the production process that will prevent this type of defect. The 8D method is used to eliminate external errors, i.e. those that are reported by clients and internal, reported by employees (internal clients), including those who inspect the quality of manufactured products or production workers who have noticed a defect in the product. Reported problems are important from the point of view of quality costs and meeting customers' expectations of the purchased product [16, 17].

After the complaint was filed by an external client, a team of five persons was appointed: quality manager, quality specialist, operator, maintenance engineer, operational manager and an appointed leader, who became the quality manager (1D). The task of this team was first of all to precisely determine the problem (2D). After reviewing the complaint, it was found that the defective product had exchanged components; this nonconformity was detected in the Type A electric beam. In the examined enterprise, immediate complaint actions were taken (3D):

- 1) the recipient set aside the Type A electric beams for later selection - 3917 pcs,
- 2) due to the high similarity of the Type B electric beams, a decision was made to secure them (preventive action) for later selection - 1596 pcs,
- 3) selection of secured products (Type A - 1307 pcs, Type B - 548 pcs) made by a team established in the analyzed company at the recipient's premises,
- 4) selection of secured products (Type A - 2610 pcs, Type B - 1048 pcs) made by an external company (hired by the analyzed enterprise) at the recipient's premises,
- 5) operator training and conversation about the problem.

Another element of the analysis was to determine the causes of the complaint together with their percentage share (4D). It was found that this problem was mainly due to human error, because the operator did not follow the correct procedure of the performed operation, he did he did not have work experience due to his short length of service (80 %). In addition, this operator did not perform the test after the performed activity (10 %), it resulted from the fact that the test label from the previous test was not removed from the analyzed product



before the start of the next operation (10 %). To sum up this stage, the main reason for not detecting the resulting defect was the operator's failure to perform the planned procedure.

In order to prevent such flaws in future, corrective actions (5D) were defined, i.e. operator training was planned regarding the correct procedure for performing operations and the need to conduct quality tests.

The appointed team performed the validation and implemented permanent corrective actions (6D) and preventive actions (7D), i.e. at the workplace where the analyzed activity was performed, photos of the nonconforming product were posted, as well as additional instructions regarding the performed operation and quality tests.

The final stage of the analysis (8D) was closure and evaluation of the conducted reporting.

5. CONCLUSION

In the analyzed production company, the level of quality of the offered products (electric beams) is at an acceptable level, which is 0.6 %. The management staff of the examined company cares about good relations with clients, among others by satisfying their expectations as to the finished product. One of the strategic goals of the company is the quality of the products because it is of great importance in the fight for clients, moreover, according to the PDCA principle, processes are carried out aimed at continuous improvement and perfection [18].

In the examined enterprise, in order to ensure the quality of manufactured products, the focus should be mainly on eliminating T1 defects. To this end, appropriate employee training should be planned and personnel turnover reduced through the use of an appropriate incentive system, an increase in remuneration or concluding long-term contracts. These activities will aim to minimize the number of complaints, because according to the 1-10-100 principle, the earlier we detect and solve a given problem, the less it will cost us, and our company will not lose its reputation or market share.

In the event of a complaint outside of the procedures adopted by the company (8D, 5 Whys, Ishikawa), action should be taken to minimize its effects, thus showing care for customer satisfaction and maintaining good relations with them.

The actions taken by the team of employees in the examined facility were correct because the response to the complaint was immediate. Additional measures were also taken, i.e. one additional product (Type B) was secured due to the high similarity to the defective product (Type A) to prevent customer dissatisfaction and additional losses.

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