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Analysis of Non-Conformities in the Logistics Quality Management System Caused by Human Errors

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Abstract:- Non-conformities in logistics activities management systems involve events caused by omissions in the planning, execution and control processes caused by a human error in the logistics services. This paper discusses the possible options for overcoming or compensating for emerging problems in the implementation of the plans for quality improvement in logistics organisations caused by human errors. The Process Decision Programme Chart Method has been applied, which allows identification and analysis of these problems and their likelihood before the non-conforming products reach the customers. It has been concluded that despite the numerous problems in the implementation of plans for quality improvement caused by human errors in the logistics chain, the application of the method allows for more effective management of the system and has the potential to minimise these failures in the implementation of the plans.

Keywords:- *Logistical Processes.*

I. INTRODUCTION

Non-conformities in logistics activities management systems also involve events caused by omissions in the planning, execution and control processes caused by a human error in the logistics services. [1, 2]. These human errors are alarming and a matter of concern and risk for both the individuals that have allowed them and the logistics organisations [3, 4, 5]. The outcomes of these errors are both threatened sanctions or dismissal for the employee concerned and worsening of the business economic results [6, 7, 8]. On the one hand, human errors in management are the result of systematic failures in the procedure that could be accidental and unintentional, and, on the other hand, the result of disincentives and intentional sabotage of the rules. These errors give rise to risks and deviations from the normal functioning of the logistics management system [9].

There is a need to find an approach for sufficiently effective countermeasures, the primary focus of which is to reduce the undesired variability both in the logistics system and in human conduct. The management of risks of human errors should focus on the management of the possible incidents that could adversely impact and worsen the economic results of the logistics organisation because of a delay or non-fulfilment of supplies to customers [10, 11].

Numerous factors that contribute to the emergence of human errors. not just in logistics chains, have been discussed in scientific literature [12]. Furthermore, over the past few years more frequent cases of human errors in the management of work processes has been observed [13, 14]. Thus, there is a need to study and analyse them so that they can be minimised.

The objective of this paper is to identify the main possible options for overcoming or compensating for emerging problems in the implementation of the plans for quality improvement in logistics organisations caused by human errors by using the Process Decision Programme Chart [15].

II. METHODS

This paper applies the Process Decision Programme Chart [16, 17, 18] method. The method is used for a systematic analysis of the causes for possible failures in the development of quality improvement plans and includes development of specific measures for overcoming or compensating for each identified problem [19, 20, 21].

The application of the method in logistics organisations [22] allows for both prevention of problems that could compromise the implementation of the plan and development and analysis of possible solutions to be applied in the event of a problem [23].

The procedure for applying the method includes the following primary stages:

- Formation of an expert team in the field of the relevant problem studied for building a diagram of the proposed quality improvement plan as shown on figure 1. This diagram should include several levels of hierarchy. The objective of the study performed should be highest in the hierarchy. The second level of the hierarchy should cover all main activities that could impact the fulfilment of the objective. The third level of the hierarchy should cover all main problems that could arise in the implementation of the main activities. The expert team should carry out a brainstorming discussion for identification of these main problems.
- After identification of all main problems, a discussion should be carried out for reaching a consensus on a decision on the possible controls for elimination of the problems that have occurred. These countermeasures should be recorded

at the fourth level of the hierarchy. The countermeasures could be both specific actions for changes in the plan that could prevent the problem and actions that could eliminate it once the problem has occurred.

- The last stage of the method application is taking a decision on the feasibility of each control measure. The decisions taken by the expert team should be considered both from the perspective of their effectiveness based on predefined criteria and according to the necessary costs for their implementation. Other factors that may impact the decisions taken are related to the limited availability of the necessary resources, including human resources, and the possibilities to practically introduce the new work methods, etc. The more feasible and priority measures for implementation should be marked with an "blue" and those that are less feasible should be marked with an "yellow".

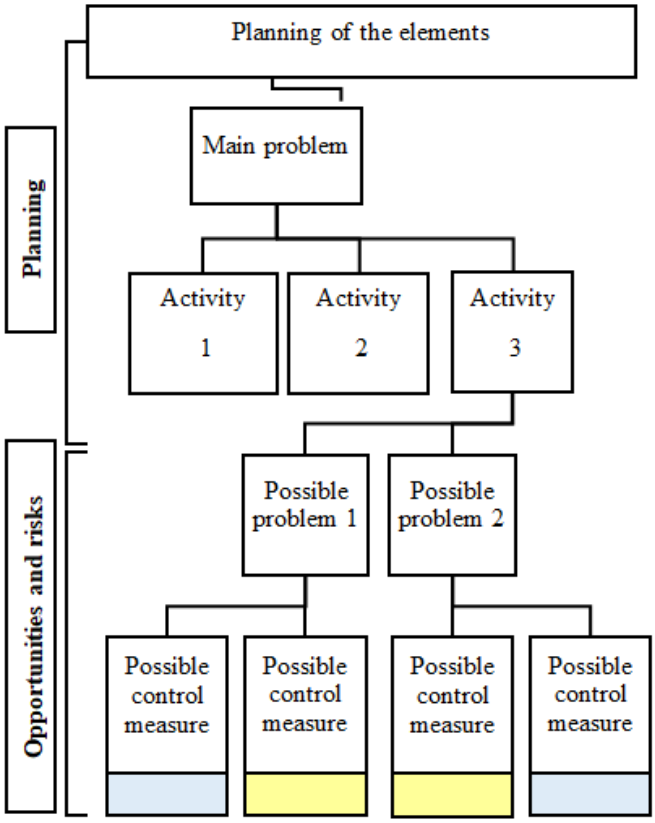

Fig. 1. Procedure for application of the Process Decision Programme Chart during the analysis of non-conformities in the logistics quality management system. (Source: Own research)

III. RESULTS

The implemented Process Decision Programme Chart procedure for analysis of non-conformities in the quality management system of logistics organisations is illustrated on figure 1. The results from the consensus decisions taken by the expert team related to different types of human errors caused by intentional or unintentional deviations from a certain rule or procedure include the following more important aspects:

A. Routine breaches related to the introduced procedures and work method.

- Incidents and accidents

Human errors are the main cause for incidents and accidents in logistics organisations. This risk can be countered by creating better working conditions and control on the use of protective equipment. A good practice in this regard is to carry out instructions and trainings for the employees with suitable frequency for the organisation.

- Violation of work discipline

Another possible cause of human errors is the intentional violation of work discipline, which could be caused by worsening of the working conditions, negative attitude toward the staff of the senior management, lack of knowledge about the working rules and other subjective reasons. The possibilities to reduce the risks are related to the introduction of an occupational health and safety management system, organisation of periodic trainings and instructions about the rules introduced in the logistics organisation, reporting and investigation of systematic violations.

B. Updating the procedures that have been forcibly introduced because of a specific situation

The expert team reached to a consensus that the highest risk for the quality management system is non-compliance with the introduced rules because of a refusal to implement those rules that have been forcibly introduced. The possible priority controls are related to finding a suitable approach to integrate the staff, introduction of suitable incentives to motivate the employees to follow the rules, training for the employees engaged with activities related to the newly introduced rules and, last but not least, exercising adequate control on compliance with the rules.

C. Failure to use the appropriate equipment or method

The use of equipment that is not appropriate for the relevant task or an improper work method during the execution of the logistics operations are the second most important reasons for non-conformities in the quality management system. These reasons often result in errors in the product shipping. The main methods for control and counteraction in this aspect are: purchasing adequate equipment for the shipping processes, creation of illustrative instructions for the implementation of the processes put on a visible place, putting signs with warnings and instructions on the proper implementation of the operation, training on the work methods and equipment used.

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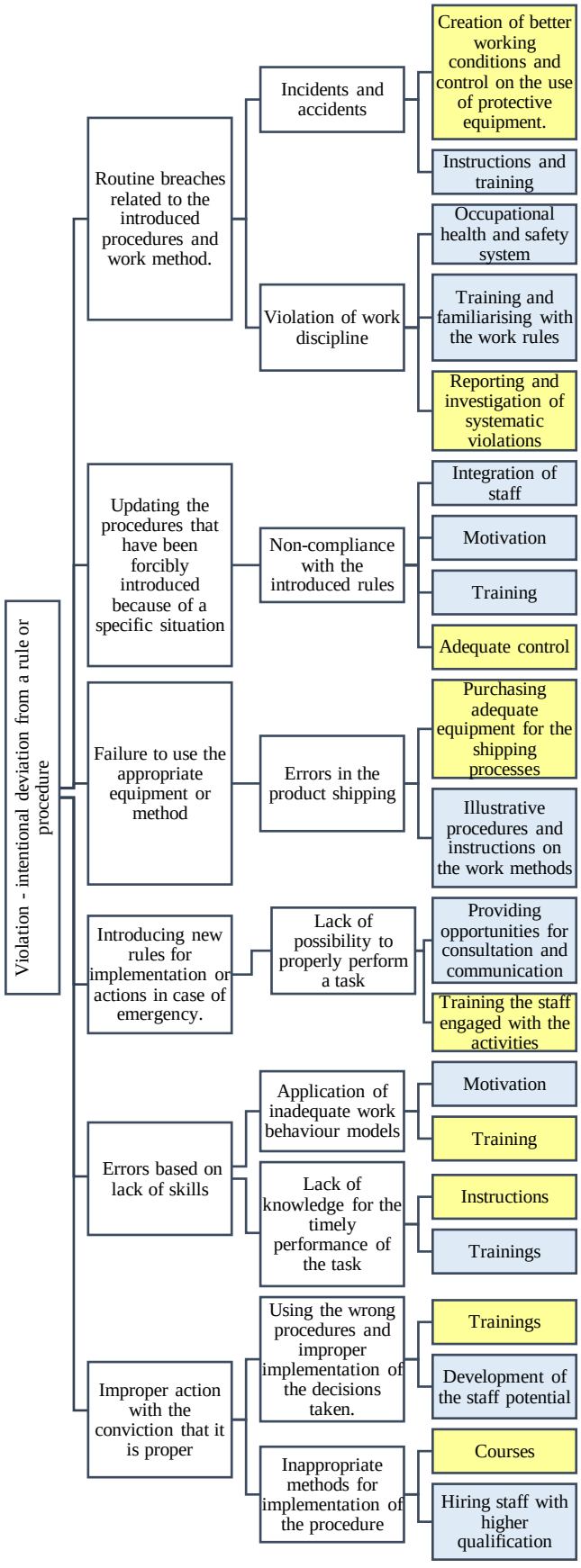

Fig. 2. Process Decision Programme Chart - analysis of errors

D. Introducing new rules for implementation or actions in case of emergency.

There is often a risk of lack of possibility to properly perform a task as planned when introducing new rules in the quality management system. Before the introduction of the new rules, possibilities should be given for consultation and communication with the teams that will put the new rules into practice. Special attention should be given to the challenges in the introduction of new software for implementation of already routine operations and activities in logistics organisations. The successful introduction of new work rules can be only achieved through the simultaneous efforts of those implementing the processes in the specific conditions and the senior management that introduces them and is thus responsible for adopting the changes. The lack of synchronisation and coordination between the actors in the entire process of introduction of new rules often leads to a failure in their establishment and their circumvention or resistance. The introduction of these new rules for the purpose of improving the quality management system requires new resources, significant efforts, coordination between all persons involved in the process and a shared objective for adoption of the changes. These objectives can be fulfilled through introductory trainings, seminars and practical exercises.

E. Errors based on lack of skills

Management of the quality assurance system is also associated with the introduction of rules that look appropriate only on paper but turn out to be inapplicable in practice. To ensure its effective management, the procedures for introducing it should provide an adequate description of the actual activities and logistics operations and should be based on the possibility for implementation by the employees that are practically bound by these rules. One of the possible reasons for the lack of performance of the logistics tasks is the lack of skills among those implementing the processes, their inability to meet the challenging requirements and respond to the expectations for proper performance. This lack of skills, however, can be compensated by a simulation training and suitable control on the performance of operations. When quality management systems are developed and introduced, the differences in human performance should be taken into account. In real cases in the logistics sector often the ones implementing the instructions and quality management procedures are put under the pressure of the rapid changes in the conditions of the task performed. Under the influence of these factors, the overloaded workforce may turn out to be incapable of performing the assigned tasks in due time considering the fact that the conditions related to each case change over time. Overcoming these risk factors is possible by periodic situational trainings and more detailed work instructions focusing on the practical application of the work rules.

F. Improper action with the conviction that it is proper

Some of the reasons for the risk of human errors are related to the application of the incorrect procedures or the incorrect implementation of the decisions taken.

The distribution of procedures that are already invalid during the update of the quality management system results in non-conformities throughout the system. The necessary control on the introduction of the new rules and work methods need to be exercised during the implementation of procedures. The presence of stimulus or additional motivation through instructions and trainings would minimise this risk. In most cases the introduction of new work procedures interferes with the established concepts and performance standards, as well as the adopted criteria for right or wrong in the implementation of the logistics operations. These factors could create conditions for wrong assessment by the employees when taking a decision on how to act during routine situations after changes in the priorities and performance criteria. This necessitates the conduct of trainings and instructions on the new requirements in order to develop the staff potential and minimise the conditions for undertaking actions after incorrect evaluation of the situation or circumstances. A good practice to overcome the risk is to stimulate the organisational culture, which is favourable for achieving team work and encourages the introduction of innovations.

There are certain risks from the use of inappropriate methods for implementation of the procedure when changes to the system are introduced for the purpose of improving it. These risks are associated with the excessive application of the newly introduced rules only, where their use is not appropriate, or the insufficient application of the new work methods for fear of improper application due to the lack of knowledge or practical skills. All cases where the specific methods for the newly introduced rules have not been applied in a timely manner or have not been applied at all should be analysed in order to undertake adequate actions to minimise the risk. In most cases, the refusal to use and apply the rules is the result of the lack of practical experience on their application among the employees that should follow them. These conditions can be improved through training to improve their skills in the application of the rules or by hiring specialists with higher qualifications, who have practical experience and perceive the new work methods as routine ones.

IV. CONCLUSION

It has been concluded that despite the numerous problems in the implementation of plans for quality improvement caused by human errors in the logistics chain, the application of the Process Decision Programme Chart method allows for more effective quality management and has the potential to minimise failures in the implementation of the plans. In this context, the new methods for execution of the logistics operations that are suitable for application should be undertaken where appropriate and where the benefits of their introduction sufficiently outweigh the risks from the lack of knowledge and skills on their application.

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