

EFFECTIVE SYSTEM FOR MAINTENANCE OF THE ROLLING STOCK OF THE COMMUNAL COMPANIES

M.Sc. Talevski N. PhD.¹, D-r Dukoski Ivo¹, Doc. M.Sc. Josevski Z. PhD.¹.

University "Sv. K. Ohridski" In Bitola, Faculty of Technical Sciences Bitola, Republic of Macedonia²

Abstract: *The rolling stock is a major part of each transportation company. All procedures of planning, realization and implementation of the operational activities are related to the alertness of the rolling stock, particularly the communal companies because they implement activities that the citizens are concerned. Collection, transportation and disposal of the municipal waste are functions which are an integral part of the functioning of the rolling stock. Therefore maintenance of the rolling stock should be regularly and by strictly regulations of a technical nature. In this labor it will be presented a proposal of an effective operational concept for managing records of the technical accuracy of the rolling stock of the Public Communal Company – Prilep, as its proper planning. Thus this labor will actually contribute to the initiation of an efficient operation and removing the disadvantages that follow the technical accuracy of the rolling stock. Each integration of the modern IT technology will be a benefit for quality in the maintaining, and it will eventually result with increased efficiency and exploitation. The community of Prilep would be a promoter of a different approach of working in the communal companies in Republic of Macedonia.*

Keywords: COMMUNAL COMPANIES, COMMUNAL WASTW, PRILEP, TRANSPORTATIONAL COMPANY

1. Introduction

The rolling stock implies the sum of all transportation vehicles in the autotransportation company (cargo vehicles, construction machinery, tancers, service vehicles, etc). The rolling stock is divided into heterogeneous and homogeneous. Success in working and management in a single company, such as the function of the maintaining of the rolling stock depends on the quality in the decision making. These decisions are in the process of recording, analyzing and using the data and informations. In addition, the rolling stock in the communal companies is a foundation to its existence and basic responsibility, competence, activity and service. Basically the communal companies have heterogeneous rolling stock, with different functions in character, purpose, territorial action, degree of specialization, type, kind, size and other features that are part of its structure. The rolling stock in the Public Communal Company – Prilep is located in the waste sector in which belong a great part of the workshops that are in charge of the technical accuracy. In this labor it will be presented an effective draft system with initially purposed software solution and concrete implementation. That particular implementation relates to the Public Communal Company – Prilep.

2. Organizational and hierarchical structure of the public communal company – Prilep

The Public Communal Company – Prilep is formed in 2004, and is a specialized company to carry out the communal activities on the territory of the community in Prilep.

As we previously pointed out to achieve optimal efficiency the Public Communal Company – Prilep is divided into several working units or sectors: Parks and greenery; Maintenance of the public traffic areas; Collection, transportation and disposal; Landfill and Cemeteries.

The concept of collecting the municipal waste in the Community of Prilep is implemented by two methods: Concept of export, Concept of decision.

Aspects that must be satisfied for the quality of the work of the rolling stock are:

- Logistics (organizational);
- Economics (resources and costs);
- Exploitation (indicators and measurements).

Only if these aspects are satisfied as much as possible and are placed in the analyzes and calculations from the above measurements, success in the work, the quality of the future investments, will give a result, that will be the basis for better utilization of the work.

3. General characteristics of the rolling stock

The rolling stock of the Public Communal Company – Prilep is heterogeneous, has a large variety of vehicles by brand, kind, type, year of production, capacity, purpose, function, technical accuracy and exploitation. The rolling stock of the working unit – collection, transportation and disposal of the municipal waste in 2010, has 16 vehicles with 6 different brands and 13 different types. But this structure of the rolling stock is needed from the aspect of modern requirements in road traffic, particularly from the activities that carry out this company. In addition, you should pursue towards unification of the rolling stock as much as possible, because it will contribute to easier maintenance of the vehicles, supplying spare parts, engines, tires, fuel, oil and lubricants, it will decrease the need for specialized tools and equipment, and it will eventually impact on reducing the costs of maintaining and repairing the vehicles.

4. Plan for maintaining the rolling stock

Plan for maintaining the rolling stock of the communal companies is presented in the following picture, also explained through an example of a vehicle:

Plan for technical maintenance of the vehicles of the rolling stock							
Month _____, Year _____							
Sequence number							

Date: _____ year

Manager: _____

Fig.1 Form of plan for technical maintenance of the rolling stock in the communal companies.

For example on day 17 of the month, working tasks of the mechanical workshop are: vehicles with sequence number 4 and 13 is necessary to perform a service in the second cycle of the exploitative period of the vehicle, for vehicle in sequence number 8 is required to perform a second service from the first cycle of the exploitative period of the vehicle. Here we can define some characteristics of these types of servicing such as: workload, time needed, the required manpower, the specifics of the work, necessary tools and equipment etc., but it should be noted what can be drawn

from this kind of planning of the technical maintenance of the vehicles.

With this form records are kept for the technical maintenance of the rolling stock, which would greatly improve the situation in the workshops and warehouse. In the workshops would be created a greater organization and coordination, and also would be imposed a moment of motivation among the workers, because everyone will know its work, and at the same time will be planned tasks for the whole month ahead. In the following picture is presented graphical pyramid in request of the data for exploitation of the vehicles per day, per week, per month and annually. But if its necessary it can be set aside and reviewed quarterly in any required period.

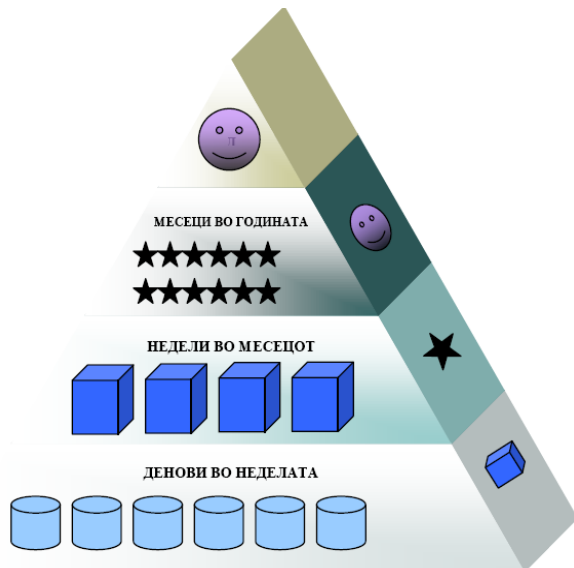


Fig.2 Scheme for collecting the data through everyday patterns

Light blue balls present daily evidential sheet, so if there are 6 working days in the week, we will get a weekly review of exploitational indicators of the productivity of the rolling stock. Dark blue squares present weekly evidential sheet, which are based on the daily evidential sheets, so 4 working weeks in the month present us the monthly review of the indicators of the working productivity of the rolling stock. Black stars present monthly evidential data for the entire rolling stock. They are based on the weekly evidential sheets, so if we have 12 months of the year, then with the sum of all monthly evidential sheets, we would get the indicators of the overall productivity for the entire rolling stock of the company. In this way, it would work the informational system for collecting the data from the exploitation of the rolling stock in the company.

5. Facilities for maintenance of the rolling stock

Facilities for maintenance of the rolling stock of the Public Communal Company – Prilep are given on the following pictures:



Fig. 3 Mechanical workshop



Fig. 4 External working channels



Fig. 5 Movable crane



Fig. 6 Working mechanic panel



Fig. 7 Working surface in the mechanical workshop



Fig. 8 Primitive substitute for the required special equipment in the mechanical workshop

The technical maintenance of motor vehicles, mainly can be done: in the open space (not covered channels – jacks, ramps, concreted – asphalt flat surface, work etc.), and in closed space (garage, service, etc.). In the open space, generally we do not ask the question for maneuvering of the vehicles. Technical maintenance is done on the open channels, jacks, ramps or on a flat surface. Recently, very often are appearing moving services with special vehicles, equipped with the necessary tools, accessories and equipment. Unfortunately this modern example is no yet implemented in Republic of Macedonia and its implementation is necessary to invest in the equipment of this kind.

6. Integration of the modern IT technologies in maintaining the rolling stock

Implementation of software, aims to provide support to the process of maintaining the vehicles. The basis functions are: planning the technical maintenance and repairs, IT support, supplying the spare parts, storing the spare parts and materials, maintaining the workshop (maintaining the equipment, maintaining the buildings and installations). The establishment of these support functions, will allow an optimal operation of the entire rolling stock. While planning the technical maintenance and repairs, mainly depends from: the terms for exploitation of the vehicles, the technical characteristic of the vehicles, the size and scope of the production program, available facilities (working facilities, qualification structure of the employees, tools and equipment) etc.

If the planning of the technical maintenance show us which conditions should be fulfilled for it to be successful and effectively, in the company first we have to make prestructure and certain interventions, such as: supply of new vehicles that will need to have as much as possible the same technical features with which we will get a unification of the rolling stock, the company should have production program of the qualification structure of the human resources that will employ traffic profiles, and professionally would be solved this situation with the car park and would be increased its productivity and efficiency, improvement of the available capacities, construction of service for technical maintaining of the vehicles or reconstruction of the existing workshop which will store all the norms and standards (providing the required area for vehicles, providing the required space for maneuvering the vehicles, working surface for the employees, integrated heating system, ventilation system, lighting system, working channels with embedded hidraulical jacks etc.) supplying modern tools and equipment for technical maintenance (supplying specialized tools, supplying basic tools – set of keys, supplying equipment and devices for lubricating the vehicles), providing and constructing facilities (garages) for keeping the vehicles, constructing warehouse space, purchase of supplies (spare parts, engines, oil, fuel, tires) which will greatly reduce the costs, improve the qualifical structure of the human resources (through training the existing

staff, advancement, looking for solution for the management functions from existing internal resources and finding a solution from the outside, employment of expert).

Thus the overall planning and the planning of the maintenance and repairment of the vehicles provides: optimal technical accuracy of the vehicles, less hard work per unit (work hours, shifts of the employees etc.), extended life of the vehicles, more rational utilization of the capacities, greater number of working days of the vehicles in exploitation. For this planning to be successful and efficient, data are required for: the type, number, amount of the technical maintenance and repairs, mileage for a specified period, working and technical documentation. Good maintenance program unites the experience of the employees and the manufacturer's recommendations, defines them as a set of tasks and activities, tasks for their implementation in stages of realization with specified materials and human resources and output documents, documenting the implementation of the activities in the exploitational life of the vehicles.

For one successful technological plan to develop, for the entire evidention of the rolling stock and its maintenance, we propose to develop an informational system, that will provide database and information about the rolling stock and it would be planned all the actions and tasks of the rolling stock. This informational system will has as an assignment to increase the efficiency of the work or to perform regionalization in the work, by providing efficient services to it costumers and profitably working by minimizing the cost of working. The informational system should provide: evidence of the technical and exploitational characteristics of the vehicles or the rolling stock, information for the quality of individual vehicles, information for accurate defining of the procedures for maintenance of each vehicle and the time between the implementation of two procedures for maintenance, evidention of the maintenance costs for the vehicles, evidention of the cost for using the vehicles, evidention of the income per vehicle, defining the amortized period and the optimal age structure of the rolling stock, data for the optimal condition and parts.

7. Benefit of the new approach in maintaining the rolling stock

The result or the quality of the established informational system in keeping evidention of the vehicles, will contribute to the quality, accuracy, precision, completeness and timeliness of collecting the data. They will be completely accurate, unambiguous, comprehensive and simultaneous, so the operator and the computer scan can still be processed, with which we will get technical and economic justification. For that purpose this labor accurately will define the sources and destinations of the information, accurately will define the development of the informations and modeling the informations and the procedure for their analysis and processing. The organization of the informational system in exploitation and maintenance of the vehicles, is based on two types of information such as:

- The interventions of the vehicles – technical information;
- The operation of the vehicles – economic information.

Only this established system in maintaining the rolling stock, with a large range of each activity can be created and sustained a software solution. This software solution should be applicalble and to be from technical and economical nature. In this labor it is represented by enumerating all the operations that need to be input for the new software operation. This kind of work is at an early stage for the public companies in Republic of Macedonia. For implementation and benefit from this kind of systematic approach should investment in the new technologies. But this labor has a purpose to enter a new dynamic in the work of the rolling stock.

The community of Prilep is a promoter of this work when it comes to the rolling stock.

SUMMARY

In this labor we summarize that for quality of the work in the communal companies, should have permanent realistic research in the rolling stock. With a qualitative, effective proposed system for maintaining the rolling stock, will be achieved planned and sustainable policy of the communal company.

With this we will get quality in the rolling stock, his alertness, accuracy, efficiency and a step towards increased profitability of the work. While the colorful figure above in this labor, gives a presentation that already exist a system that should be upgraded with modern technical and technological concepts for maintaining the rolling stock.

And finally we summarize that all the elements of this labor are intended to be an initial step in the application of the new IT technologies and software solutions that should work in creating a long – term logistical, economical and exploitational benefit, which with a realistic calculations would be scientifically sustained. This labor is derived from a field, from the daily activities of the rolling stock of the Public Communal Company – Prilep. With that its uniqueness is unquestionable and therefore this labor presents a real base for future sustainable quality results. Also the affective system of maintenance result from the daily activities and it gets the unique character of an effective system of maintaining the rolling stock.

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