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THE BASIS OF REQUESTING INFORMATION IN MILITARY TRANSPORTATION CONCERNING THE GOODS TO BE TRANSPORTED

Abstract

At present social and economic needs determine transportation needs, and these needs appear quite separately and differently. All transporters and carriers must adapt to these essential differences as the basic requirements of a transportation task are economy, speed, punctuality, and also the minimization or elimination of damage to the goods. These requirements apply not only to civil transportation tasks but also to transportation needs in the Hungarian Army. However, in the 21st century, these needs cannot be fulfilled in any organization, including the Hungarian Army, without an up-to-date information technology system supporting the planning, organization and execution of transportation tasks. The purpose of this study is to summarize the most important data of the database concerning the transported goods. This database can be considered the basis of the IT system supporting road transport.

A jelenkorban a társadalmi és gazdasági igények lényegesen meghatározzák a szállítási igényeket, illetve azok jelentkezése nagyon elkülönülten és különbözőképpen kerülnek felszínre. Ezekhez a lényegi eltérésekhez minden szállítmányozónak és fuvarozónak alkalmazkodnia kell, mivel a fuvarozási feladat végrehajtásának alapkövetelménye a gazdaságosság, gyorsaság és a pontosság, illetve ezek mellett az árukárok minimalizálása. Ezen szempontok nem csak a polgári szállítási feladatokra érvényes, hanem a Magyar Honvédségben jelentkező anyagszállítási igényekre is. Azonban ezen igények kielégítése a XXI. században már nem nélkülözheti egy a kor követelményeinek megfelelő, korszerű szállítási feladatok tervezését, szervezését, végrehajtását támogató informatikai rendszer meglétét minden vállalatnál, szervezetnél, így a Magyar Honvédségnél sem. A cikk célja nem más, mint a közúti szállításokat támogató informatikai rendszer alapjainak tekinthető adatbázis fontosabb – a továbbítandó termékre vonatkozó – információinak összefoglalása.

Keywords: road transport, product informations, information system, data base ~ közúti szállítás, termék információk, informatikai rendszer, adatbázis

INTRODUCTION

Strange though it may seem, a transportation task starts when there is an intention in an organization or unit to transport some material, whatever the purpose is. Even at that moment, the person requesting transportation must have information and data necessary to transport the material. The planner of transportation can only obtain this information from that person since this information concerns the goods to be transported and the loading and unloading activity. Data connected to materials largely determine execution since without these data it is quite difficult to organize transportation in an optimal way and minimize adverse effects to goods during carriage and therefore minimize damage to the goods.

Another set of very important information concerns the vehicle of carriage. A transport vehicle basically has three types of capacity concerning the materials to be transported. These are payload, loading volume and loading area. It is important which of the three has to be planned based on the properties of the goods to be carried. Also, in many cases other modes of transport have to be utilized, too, therefore the dimensions of the vehicle can also be important.

A very important information group is data associated with the route, especially if oversized or overweight goods are transported or a transport convoy is involved. Information concerning the driver of the vehicle is important partly for the planning process preceding transport, partly for settling accounts after transport.

Based on the above, the information indispensable for carriage can be grouped as follows:

- Information relating to the transported materials;
- Information relating to the vehicle carrying the materials;
- Information relating to the route, including data of loading, unloading and transfer places;
- Information relating to the personnel executing the transport task.

1. STRESSES AFFECTING THE GOODS [1]

The first step of the planning, organizing process before transport should be the collection of all the information relating to the goods to be transported, if the sender has not done it in the delivery request. Its necessity cannot be questioned. However, before transport it is important to know what stresses the materials are likely to encounter since the materials or their packaging cannot withstand all outside stresses, therefore it can be damaged or it causes damage to the environment. The role of packaging is to protect the goods from its environment and to protect the environment from adverse impact of the goods. The planner and organizer of transport has to know how much the packaging of the goods can withstand the stresses during transport – which may depend on a large number of things including mode of transport – because this information may determine the choice of mode of transport, transport vehicle, loading and fastening tool, etc. (S)he has to have information about the product which helps eliminate adverse effects during transportation.

Stresses occurring during transport can be the following:

1. Mechanical stress:
 - a) Static: pressure, aggregate pressure;
 - b) Dynamic;
2. Climatic stresses:
 - a) Sunshine;
 - b) Temperature;
 - c) Humidity;

- d) Precipitation;
 - e) Air pressure;
 - f) Air movement, wind;
 - g) Air pollution;
 - h) Various types of radiation.
3. Biological stresses:
 - a) Microorganisms,
 - b) Insects;
 - c) Rodents.
 4. Stresses related to humans:
 - a) Pilfering;
 - b) Faking;

1.1. Mechanical stresses

Mechanical stresses can be divided into two main groups: *static* and *dynamic* stresses. *STATIC* stresses are basically pressures from different directions. The most important and most common of these is the so-called “aggregate pressure”, which can be observed in the case of products or unit loads piled on top of one another and is present not only in the case of carriage but also in the case of storage. It is very important to know whether the goods or their packaging can withstand such stress and to what extent.

DYNAMIC stresses primarily occur when the materials move or are moved, which can occur during loading and transport. Such dynamic stresses can be the following:

- shaking, vibrating (caused by the vehicles during loading and transport – its amplitude is low but its frequency is relatively high);
- dropping (occurs relatively frequently during loading and unloading; it can be eliminated if loading/unloading is appropriately mechanized; drop height is the height from which the product can be dropped, in certain cases it is standardised);
- rolling, tipping over (it occurs during loading/unloading or if the goods are not properly fastened; it is important to use packaging that reduces the acceleration of the goods);
- impact (a single stress that occurs in a specific area on the outside surface; usually due to inappropriate handling; cannot be planned beforehand but can be reduced with the proper choice of material);
- collision (happens with two products once or several times; it is common in carriage by rail; it can be eliminated by fastening the goods properly in the vehicle);
- swinging (similar to collision but usually does not come into contact with anything else; its amplitude is relatively high, but its frequency is low).

1.2. Climatic stresses

Climatic stresses are mainly connected to the climate and weather conditions of the transport area. These include the following:

- Sunshine;
- Temperature;
- Humidity;
- Precipitation;
- Air pressure;
- Air movement;
- Air pollution;
- Various types of radiation.

All of the above list have to be taken into consideration for the time of transport, which is not always easy because weather conditions can usually not be predicted precisely. However, it definitely has to be dealt with since various forms of precipitation can cause different kinds of damage, and in transport by sea salty vapours can corrode the containers.

1.3. Biological stress

Biological stresses include all stresses caused in the transported goods by living organisms except humans. These organisms can be visible (noticeable, perceptible), and can be invisible to the human eye (microorganisms). The first group includes various rodents, and insects, which may carry germs, and can also physically damage the product or its packaging.

The second group includes bacteria, fungi and viruses, which can also damage both the product and its packaging. While it is easier to prepare for the damage made by an insect or a rodent because it can be seen, we only learn about the presence of microorganisms if the damage they caused is visible.

1.4. Stresses caused by humans

Stresses caused by humans do not include accidental damage during loading, unloading and transport resulting from accidents or human negligence or mistakes. They include intentional actions which can cause damage to the product or its packaging. The most important and most common of these is pilfering, that is, the intentional changing of the content and amount of the product (reducing the amount of the product). This can be partly avoided by the careful selection of packaging material and tool, and by making the opening of the package complicated.

2. INFORMATION RELATING TO THE TRANSPORTED MATERIAL

Unfortunately, it is not enough to provide the basic information concerning the transported goods, such as their type, amount and some external dimensions. If the sender only provides this information to the planner of transport, the transport job is not executed due to lack of information. Let us consider an example in which chairs have to be carried and only the number of chairs is given. It is also important to know what kind of chairs they are, how they are packaged – if at all – what they are made of, what their dimensions are, etc. Therefore data relating to the goods and materials can also be grouped:

- Information relating to the amount of the material;
- Information relating to the material and name of the product;
- Information relating to the packaging of the goods;
- Information relating to the handling and loading of the goods;
- Information relating to any special properties of the material.

2.1. Information relating to the amount of the material

One of the most important type of information is the amount. However, it is not so easy as it seems at first sight, as it can be given in various units of measure (pieces, ton, box, litre, cubic metre, etc.). The one most characteristic to the transported material has to be selected. Some additional information also has to be given, such as specific gravity or specific volume, etc. This can be important in deciding whether the mass or the volume is the more important criterion for choosing the transport vehicle. Also, giving the whole amount is not always enough, often data relating to the individual items (e.g. kg/piece; kg/l, etc.) may be important as well. It follows from this that the information system has to be able to handle as many different kinds of data as possible. Unit loads also have to be thought of since pallets

containers, boxes, etc. are also often used as a unit of measure, and as units to be carried. In addition, there can be products containing more than one constituent material and the amount of the materials is not the same and all the amounts may have to be given. Let us consider air defence missiles, whose propellant, payload and other structural elements are completely different and special rules have to be observed in transporting them, and the amount of hazardous materials fundamentally determine the planning of their transport. This means that for one type of goods often several designation of materials are necessary along with the accurate amounts, and also their handling in a database. [2]

2.2. Information relating to the material and designation of the product

Hazardous materials whose amount is important information in planning transport have been mentioned above. However, another piece of important information is the accurate designation of the hazardous material(s) or goods. The rule mentioned above concerning the transport of hazardous materials on road classifies these materials and contains regulations concerning them. If the product is not designated accurately, the wrong rules may be applied, which can lead to disaster.

But proper designation is important not only in the case of materials requiring special handling but also in the case of common, often transported materials. A codification process was started in the Hungarian Army a few years ago with the aim of each product being referred to by only a code. Unfortunately, it has been a partial success only. Unfortunately there are records in which two, essentially the same products are listed under two or even more codes. Not to mention cases when the name only partially identifies the equipment, if at all. How much easier it would be to collect the necessary data to plan transport if the inventories contained only one code and name for a specific product and its composition. The planner of carriage could immediately access the relevant data and properties, and his/her work would be much easier and planning time would be reduced.

The accurate designation of the material of the transported product is also important because of the above-mentioned stresses. In every mode of transport there are stresses adversely affecting the products, only their effect and extent may be different. The damage they cause largely depends on the material of the product, the packaging, the mode of transport, and the circumstances of transport (e.g. part of day, season, distance, etc.). If the transported goods are not defined accurately, the wrong type of transport vehicle may be selected and the goods may suffer damage. A simple example is “furniture”. “Furniture” is an umbrella term including many types. However, the material of the furniture is very important. In dry and sunny weather it does not make any difference but wooden furniture may not withstand rainy autumn weather without damage. On the other hand, plastic furniture may get deformed in strong and prolonged sunshine. [3]

2.3. Information related to the packaging of the material

Transported goods are usually packaged in some form. The form, appropriateness and quality of packaging is important information from the point of view of transport. Loading/unloading and the technology applicable in transport are fundamentally determined by the packaging material and the packaging tool. However, it is also important information if the transported material does not have packaging at all and has to be transported in a tank for example.

The material of the packaging is related to the expected transport stresses, the type of the cargo compartment of the transport vehicle and the loading device and its grabbing mechanism. Paper packaging can withstand far less numerous and intense stresses than for example wooden packaging. Also, the material used for packaging can greatly alter the mass, volume and layout of the product on the transport vehicle (for example the products can be

packed on one another). All this information has to be taken into account when determining the necessary capacity of the loading machine and the transport vehicle.

The type of the used or usable packaging device and information relating to it are also important from the point of view of carriage. This does not only include external dimensions but also internal layout (e.g. internal dimensions, number and layout of lashing points, etc.) can be important. Let us take a container, which is one of the most commonly used packaging and unit load device. Containers are typically standardised but various standards are in use. The most common standard is the ISO standard but any company can use its own special container size and also air transport containers (different layout and dimensions) and sea transport containers (resistant to salty vapours) differ from standard road and railway containers. The Hungarian Army also has containers not used anywhere else. In addition, standard containers also have special designs, they can have extra equipment such as an air conditioner, which makes it impossible to use standard loading equipment. Then there are standard but still special designs which are only practical to use with the loading and transport equipment designed specifically for them (e.g. ACTS technology). [4], [5]

2.4. Information relating to the handling and loading of the goods

Information relating to the handling of the transported goods does not only include data mentioned earlier (packaging, material, etc.) but information relating to the necessary activities accompanying the execution of the elements of the transport process. Here information is necessary which will also appear on the packaging of the goods. Such can be information and data relating to the fragility, handling position (e.g. can only be carried in an upright position) or precipitation sensitivity of the goods or whether they can be piled on top of each other and to what extent.

Information concerning handling and the design of the packaging device greatly affect the loadability and the design of the loading device and its grabbing device. It can also be important to know the grabbing points of the product, their design and strength. The same applies to the tie down possibilities of the product, and the type, amount and strength of the applicable lashing devices. In many cases the lashing of the cargo also has to be planned and organized and without the above-mentioned information, it will be difficult and inaccurate. Inappropriate lashing of the cargo is a danger to not only the product and the transport and loading vehicle but to people and other vehicles in its environment. Not to mention the time loss caused by badly planned and organized loading and lashing, especially if a large amount of cargo has to be transported in a short time.

2.5. Information relating to the special properties of the material

Cargo can have very many properties, some of which are the same for almost all types of cargo but there are some which are applicable for a certain type or device or material. Such are live animals, oversized cargo or custom made devices and products which cannot be transported with the usual methods or technologies. In some respect hazardous materials belong here, too, but their properties and the rules governing their transport have already been laid down (ADR) and these rules have to be adhered to. Special properties definitely have to be known to transport a given product.

The Hungarian Army does not transport live animals any more but in civilian life it often happens. The transport technology used largely depends on the properties of the given animal. For example there can be great differences between two horses in size (pony or draft horse) but also in value (draft horse or racehorse). Transportation of each kind requires different organization. The same can apply to the carriage of live fish. Each kind of fish has a minimal oxygen and space requirement. Transporting carp cannot be done in the same way as transporting trout.

Oversized and overweight cargo exceed the size or mass included in regulation. These devices are usually custom made and/or only a few of them are transported. The Hungarian Army has a relatively large number of such devices (e.g. tanks) but they are not carried daily. Some equipment always exceeds allowed size limits but some can be modified to be within the limits by for example dismantling certain parts. In the latter case the organizer of transport has to know about this possibility because this information can greatly reduce transport costs. [6], [7]

SUMMARY

Planners of road transport need a great deal of information to be able to plan execution as accurately as possible. In all cases this information is primarily related to the transported cargo, its properties will determine the other elements of the transport process. In order for these data to be present it is necessary to have a database, which is important from the point of view of the transportation process. Such a database must contain as much information as possible about the transported materials, equipment and products. It is not easy to determine the necessary data as more information is needed than just the amount and the outside dimensions – far deeper professional knowledge is necessary to determine and collect all essential data.

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