

Scientific Approaches to the Provision of Dangerous Goods Transportation

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Abstract – *This article described the latest one approaches to ensuring the transport of dangerous goods. Also, when dangerous goods are transported, the biggest role in providing safety traffic are including choice of a rational route and the ability to monitor a vehicle way.*

Keywords – dangerous goods, safety, road, vehicle, transport.

Introduction

Nowadays safety of dangerous goods transport is an interesting transportation planning topic. It regards road safety, goods storage, prevention and security. The key purpose is reducing the risk of hazardous accident (e.g.: harmful contamination, toxic emissions, fire and explosions) during travel or transport operations. The consequences of accidents involving dangerous goods may be very tragic for humans, especially when occur in urban areas densely populated, for environment (both for the life forms that live there and the economy which depends on it), or for property.

The international transport of dangerous goods by road, by rail or by internal water is regulated by European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) [1].

Scientific approaches in providing transportations of ADR type

Continuous global increases in the transportation of dangerous goods, transportation set-ups with a growing number of parties, and increasingly complex information flows result in growing complexity for each stakeholder to handle [2].

The transportation of hazmats is, therefore, subject to safety requirements to both their carriers and to the materials themselves. It has been recognized as important to find a balance between the safe requirements for transporting these materials, in order to protect the populations and the environment, and the economic viability of the operation [3].

It are necessary in organization the process of transportation dangerous goods, always take measures aimed at improving the technical equipment of transportation (rolling stock, containers, vehicle of mechanization the loading and unloading process); providing the safety transportation of dangerous goods by the established routes of traffic and realization training and raising the skills for the person involved in this process.

The main tasks of efficient transportation management are: routing, which allows transportation of dangerous goods to pre-selected and established safe routes [4]. A common political tool to reduce the risk of hazmat transportation is the interdiction to this transport of certain road sections identified as more vulnerable by the regulator. The carrier is free to choose the routes and manage their risk in the available network. The hazmats industry generally place safety at the centre of their business and the analysis of safe route definitely requires further studies [3].

Cost minimization is not given priority when transportation route are planning and choosing: carriers and government agencies authorized to issue permits for the transport of

dangerous goods are mostly guided by considerations of the minimum population and / or the minimum probability of occurrence of an unwanted event [5].

When the problems related to vehicles and the transportation of dangerous goods are solving we should always know the exact location of the vehicle and cargo carried, as well as the places of loading / unloading. Information about past work on specific routes must also be studied. This can allow us to manage all vehicles efficiently, as well as to avoid fires, explosions of dangerous goods or other accidents. Information about any deviations from the route and other related info must be recorded.

The rapid development of geoinformation technologies has an impact on the development of the telematics system. There are many systems that help driver and the end customer of such transportation. Transport telematics consists of the following aspects:

- transmission of information from and to the car (telecommunications);
- information processing (information technology);
- use of information for safe transportation and effective use of existing technological solutions.

Mobile positioning services provide information about the location of the mobile terminal. The end user or other person can carry the terminal, or it can be attached to the load. A wireless connection to the network is usually based on GSM or CDMA or wireless. The network based on mobile and satellite positioning technologies can determine the location of the terminal.

Road transport is supported by telepathic systems such as:

- equipment for monitoring traffic (sensors, detectors, video detectors), devices for television surveillance (cameras);
- -satellite navigation systems (GPS, GLONASS, EGNOS, GALILEO);
- derivative systems used in navigation;
- radio communication systems;
- GIS technologies;
- road info;
- electronic cards;
- monitoring of weather and measuring systems and others.

GPS is well known as a global navigation satellite system. Similar systems exist - in Russia GLONASS and the GALILEO systems are prepared by the European Commission and the European Space Agency. GPS is the basis of the current navigation systems. In fact, GPS is the only fully-fledged global satellite positioning system in the world.

Satellite positioning systems are widely used in the world, which allows us to determine the position of objects that are equipped with positioning equipment with the necessary precision. For accuracy and speed of estimation a geographical position is very important to track the object that quickly changes position (for example, car, ship or aircraft) on a digital map, especially when dangerous goods are transporting by any mode of transport [5].

Also, the main tasks are the appropriate and justified choice of rolling stock and type of packaging; specialization of departments of transport enterprises and establishments carrying out transportation of dangerous goods; ensuring timely and full information about dangerous goods properties.

The functions of control over the carriage of dangerous goods are borne by the relevant state control bodies of the countries whose territories the carriage is carried out and should aim at ensuring strict and strict compliance by all carriers with the requirements of applicable international and national regulations in the field of safety of the transport dangerous goods [6].

To solve the problem of adequate level safety of the transportation dangerous goods, a systematic approach should be applied, considering the technological process of transportation as the only complex, dynamic system, elements which constantly interact with each other. Structural elements of this system are:

- international and national legislatures;
- control bodies;
- organizations and institutions that carry out professional training of persons involved in the performance of transportation;
- industrial and transport enterprises, which carry out shipment,
- specialized fire, rescue, medical and sanitary services;
- enterprises - manufacturers of vehicles intended for the transportation dangerous goods;
- enterprises - manufacturers of large and small-sized containers that can be used for the transport of dangerous goods;
- persons involved in the transport operations and deal with the technological process of transportation.

The purpose of this system is to ensure the safty transportation of dangerous goods and to inform the population in a timely manner about the occurrence of accidents with dangerous goods, as well as to take urgent measures to eliminate their negative consequences.

For the successful functioning of the system, legislative and methodological bases are needed. That would regulate the process of transportation of dangerous goods and establish appropriate requirements for all its elements [4].

Conclusion

Improving the technical equipment of transportation, planning of safe routing, tracking the location of the vehicle and collecting transportation information, and applying the legislative and methodological framework for regulating the process of transportation dangerous goods, will allow us to balance the economic feasibility of the carriage and ensure an adequate level of safety in its implementation.

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