THE POSSIBILITIES OF SPECIFIC INFORMATION SYSTEMS UTILIZATION FOR ROAD TRANSPORT OF DANGEROUS GOODS

MOŽNOSTI VYUŽÍVÁNÍ SPECIFICKÝCH INFORMAČNÍCH SYSTÉMŮ PRO SILNIČNÍ PŘEPRAVU NEBEZPEČNÝCH VĚCÍ

Pavlína Brožová[1]

Summary: The paper deals with characteristics of individual information systems utilized for specific freight transport of dangerous goods. It is important to use appropriate information systems minimizing possible negative impacts caused by leakages by transport or by manipulations with dangerous goods, because of serious risks by road transport of dangerous goods.

Key words: IS DOK, dangerous goods, road transport, TRINS

Anotace: Článek se zabývá charakteristikou jednotlivých informačních systémů používaných pro specifickou nákladní přepravu a to přepravu nebezpečných věcí. Protože se jedná o rizikovou silniční nákladní přepravu, je důležité využívat vhodné informační systémy minimalizující případné dopady z úniků při přepravách nebo manipulaci nebezpečných věcí.

Klíčová slova: IS DOK , nebezpečná věc, silniční doprava, TRINS

1. INTRODUCTION

Especially road and railway transport are used for transport of dangerous goods in the Czech Republic. The accident frequency is multiple higher in road transport than in railway transport and for that reason accident risk of road vehicle transporting dangerous goods is also increasing. The breakdowns are also important factor by dangerous goods transport, it means that the transported good spontaneously leaks from package or vessel into surroundings. In the case of this eventuality, it is necessary to prevent leaking of dangerous goods in the most quickly way for decreasing of health risks and environmental risks. The information systems are utilized for this purpose. The leaking matter can be easily indentified and negative impacts of leaking good can be protected.

[1] Ing. Pavlína Brožová, Ph.D., University of Pardubice, Transport Faculty Jan Perner, Department of Transport Technology and Control, Studentská 95, 532 10 Pardubice, Czech Republic, Tel.: +420 466 036 202, E-mail: pavlina.brozova@upce.cz

2. THE RISKS BY TRANSPORT OF DANGEROUS GOODS

The goods with one or more dangerous chemical characteristics are transported in the case of dangerous goods transport as follows also from the name of this specific transport. Transported goods are able to be explosive, oxidizing, flammable, toxic, corrosive, irritating, carcinogenic etc. The highest health risks and environmental risks are caused by leakage of these dangerous goods.

2.1 Risks by Loading Operations

Dangerous situations able to cause leakage of dangerous goods are also occurring by loading operations like loading, reloading and unloading (1):

a) damage of packaging by manipulation and consequent leakage of dangerous good,
b) exceeding of total weight of a vehicle and of allowable axle load,
c) violating of opening prohibition of dangerous matter packaging,
d) utilizing of not-suitable packaging,
e) wrong placing of load (transported goods),
f) wrong fixing of load and wrong protection against movement of load,
g) utilizing of non-suitable vehicle for transported goods,
h) utilizing of wrongly decontaminated vehicle,
i) violating of joint loading restriction for dangerous goods,
j) violating of smoking prohibition in nearness of dangerous goods,
k) other cases.

The most occurring cases from above mentioned are damage of packaging caused by rough handling by manipulation and exceeding of total weight of a vehicle. Exceeding of allowable weight is able to worsen driving characteristics of the vehicle.

2.2 The Risks by Transport

The risk of leakage of dangerous goods is able to be occurred not only in the case of wrong placing or fixing of load, but also in the case of traffic accident.

Serious problem is constituted by traffic accidents by dangerous matters transport. The leakage of dangerous goods is able to cause permanent deterioration of:

a) health,
b) environment,
c) assets.

The traffic accidents possibly caused by faulty technical state of vehicles have to be protected, because of serious risks connected with this kind of transport. The controls are provided by the Policy of the Czech Republic and other competitive authorities. The fact that the number of controls is decreasing between the years 2009 and 2008 and the number of fines is increasing is resulting from the table 1.

Tab. 1 – Controls of vehicles transporting dangerous goods in accordance with the ADR Agreement (2008 – 2009)

	2009	**2008**	**rozdíl**
Number of controls	1149	1483	-334
Number of ascertained troubles	152	169	-17
Number of controlled vehicles	27	30	-3
Number of quaranties	8	13	-5
Quaranties in CZK	280000	251000	29000
Number of fines	124	155	-31
Fines in CZK	128500	148000	-19500
Number of complaints by regional authorities	87	88	-1
Number of complaints by police	3	4	-1

Source: (2)

3. UTILIZED INFORMATION SYSTEMS

The information systems designed for indentifying of kind of transported dangerous good, providing of correct information how to protect incidence of good after its leakage would have been an integral part of technological process for transport of dangerous goods.

3.1 IS DOK

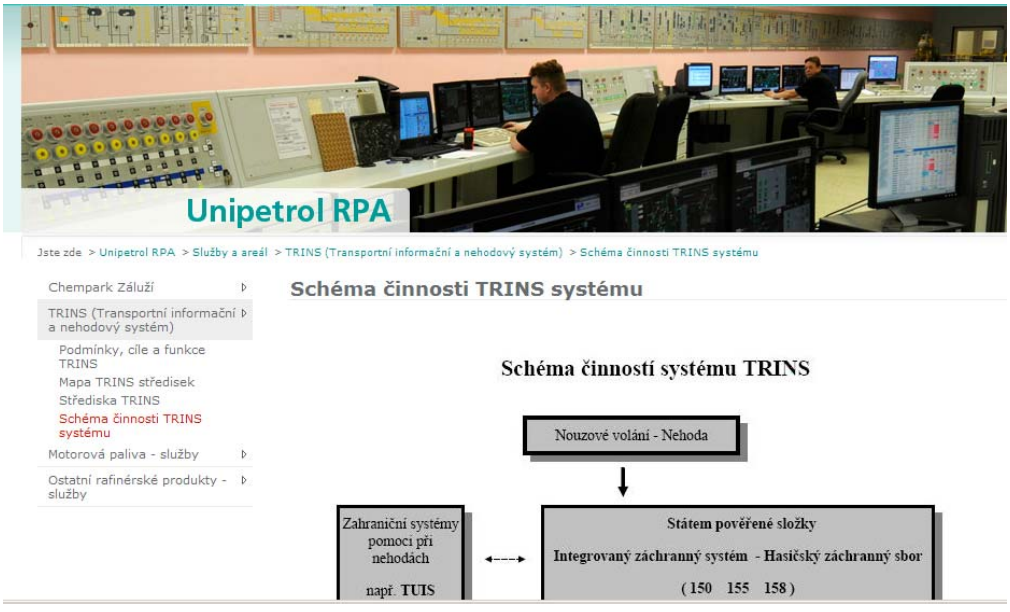
One of the well-known information systems is **Information System for Support of Preventing and Rescue Measurements in the Field of Mobile Sources of Danger (known as DOK)**. Provider of this system is the Ministry of Transport of the Czech Republic. This system is designed for two groups of users – registered users and wide public. All information about dangerous goods, sorted by safety tables or safety marks, is able to be found in this system. The legislation dealing with transport of dangerous goods and more information about transport of waste, packaging of dangerous goods including attestation, musters of transport documents, statistical summary of accidents and also links to institutions and firms dealing with production and transport of dangerous goods.

Source: (3)

Fig. 1 – IS DOK

3.2 TRINS

The Transport Informational and Accidental System TRINS is consisted of regional centres in the Czech Republic. The system provides continual help by solving of contingencies connected with transport and storage of dangerous goods. The help is provided on request of operational centres of fire brigade or of integrated rescue system. The system is consisted of three levels – phone consultation (information or consultation with specialists by phone), consultation on the place of action (sending of specialists on the place in the shortest time from asking by the fire brigade or by request on the company TRINS), practical help on the place of action (sending of forces on the place of action in the shortest time).

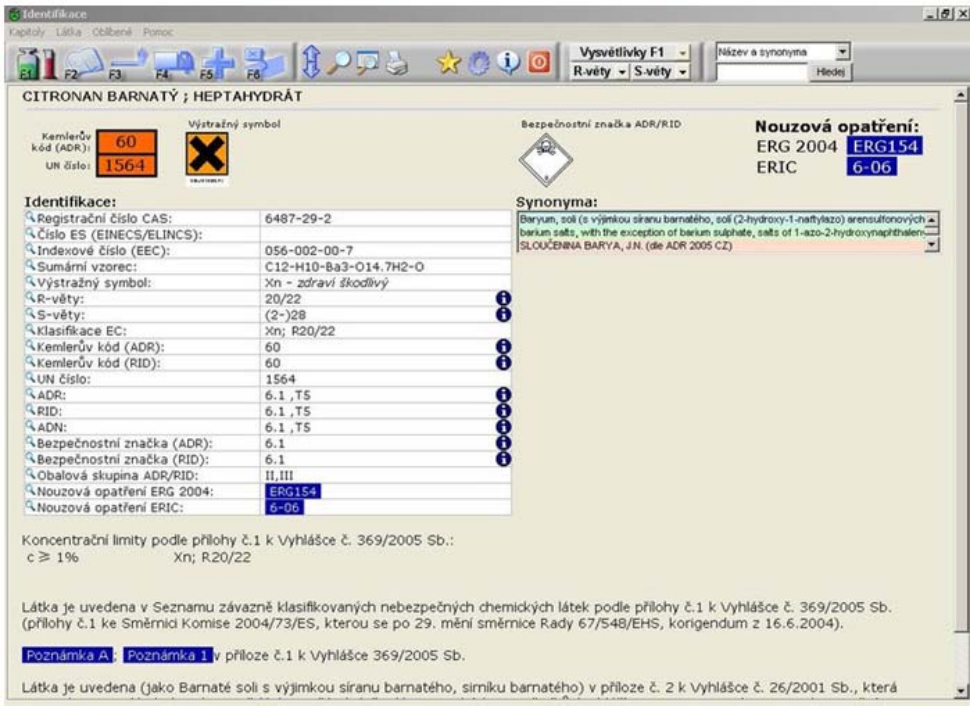


Source: (4)

Fig. 2 – TRINS

3.3 MEDIS-ALARM Database

The safety documents, instructions for case of accident and database of dangerous goods MEDIS ALARM and ADRem are able to be found on the websites of the MEDISTYL company. The MEDIS-ALARM database contains detail information about classification and characteristics of dangerous matters, fire-technical and physical-chemical characteristics of matters, transport and storing conditions, first aid rules, instructions for health treatment, toxicological and ecotoxicological information.



Source: (5)

Fig. 3 – Databasis MEDIS-ALARM

3.4 ADRem Database

The ADR Agreement is handled by the ADRem database. Complete information about requirements on transport of dangerous matters is able to be found out in this database. The database of transport documents (bills of loading) is stored in this database. The names of matters are displayed in Czech, English, French, German and all links mentioned in the program are interactive. The program is developed in cooperation with the Institute for Road and City Transport – DEKRA.

Source: (6)

Fig. 4 –ADRem diabase

3.5 ADRUN

The database of names of dangerous goods ADRUN is provided by the mentioned DEKRA Institute. The dangerous chemical matter is possible to be characterized by UN code or Czech, English, German and French name. The functions of the ADRUN database are limited, because there are accessible translations of dangerous goods names only and it is able to be integrated in some other more advanced information system.

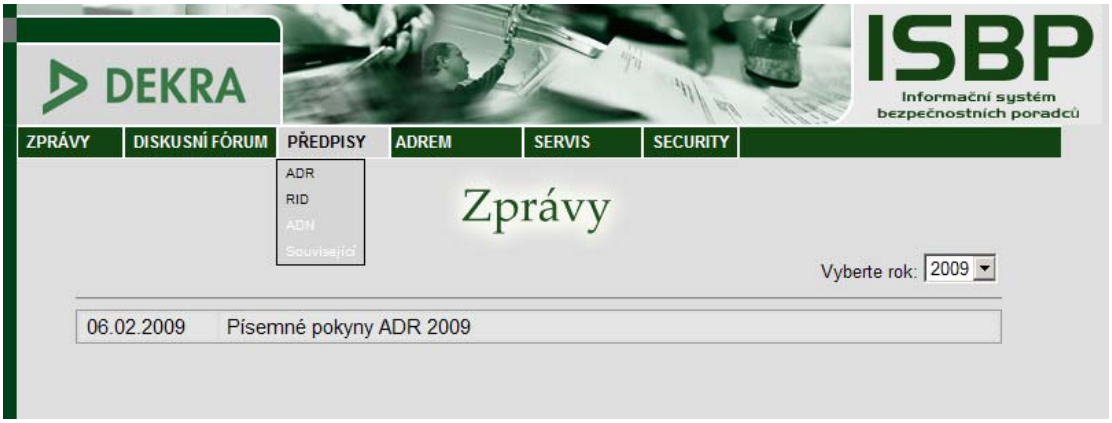
Source: (7)

Fig. 5 – ADRUN

3.6 ISBP

Information system for safety consultants (ISBP) is also operated by the DEKRA institute. The regulations ADR, RID, ADRem database and discussion group for safety consultants are accessible after login into public part of system. The discussion group is seen as a convenient supplement, because experience exchange between members of

professional public is supported in this way. This discussion group is also able to find solution of concrete problems in faster way.



Source: (8)

Fig. 6 – ADRUN

4. PROPOSAL OF COMPLEX INFORMATION SYSTEM FOR DANGEROUS GOODS TRANSPORT

There is able to be found a number of information systems designed for transport of dangerous goods. The information is distributed into this number of systems. Design of complex information system for dangerous goods transport is seen as a contribution to operability and also safety of dangerous goods transport. The information will be stored on one place with collective data basis in this case. Creation of the system structure in accordance with the possible roles of individual groups of users is presupposed.

The system will contain following functions:

a) database of dangerous goods (with translations to foreign languages),
b) characteristics chemical matters,
c) valid RID and ADR Agreements,
d) database of scientific articles dealing with dangerous goods transport,
e) all forms for transport of dangerous goods,
f) updated list of safety consultants,
g) instructions for loading, transloading and unloading operations with dangerous goods,
h) limited network segments for transport of dangerous goods,
i) hazardous network segments for transport of dangerous goods,
j) accident statistics for dangerous goods transport,
k) training possibilities for staff,
l) discussion group.

Extending volume and themes of information next to concentration of information on one place is also followed by this proposed complex information system, because of ambition to system extension to large group of professional users.

5. CONCLUSION

It is able to be said on the end of the paper that the problematic of dangerous goods transport is very comprehensive and responsibly theme. In the case of any accident or by leakage of transported matters the informedness may markedly decrease ecological impacts and also the impact on human life. The aim of this paper for that reason was to characterize individual information systems for support of dangerous goods transport in the Czech Republic.

LITERATURE

[1] BROŽOVÁ, P. *Rizika související s přepravou nebezpečných věcí v silniční dopravě.* Perner`s Contacts, 2008, 1.vyd., roč. 3, č.3, s. 3 - 7 ISSN 1801-674X.

[2] *Statistiky Policie ČR – Roční hodnocení práce dopravní policie.* [online]. Posldení revize 2010. [cit. 2010-06-05]. Dostupné z: <http: www.mvcr.cz/policie/hodnocenipolicie2010>.

[3] *IS DOK* [online]. [cit. 2010-06-01] Dostupné z : < http://cep.mdcr.cz/dok2/DokPub/dok.asp>.

[4] *TRINS* [online]. [cit. 2010-06-02] Dostupné z : < http://www.unipetrolrpa.cz/cs/index.html>.

[5] MEDIS – ALARM [online]. [cit. 2010-06-06]. Dostupné z: <http://www.medistyl.cz/db/alarm.htm>.

[6] *ADRem* [online]. [cit. 2010-06-03]. Dostupné z: <http://www.dekra-automobil.cz/index.php?file=ss.php>.

[7] *ADRUN* [online]. [cit. 2010-06-04]. Dostupné z: < http://www.usmd.cz/adrun/>

[8] *Informační systém bezpečnostních poradců.* [online]. [cit. 2010-06-09]. Dostupné z: <http://www.usmd.cz/akademie/isbp/ >.