Smart solution for area of population protection

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Abstract: - The contribution is focused on possible ways of increasing the efficiency, facilitation and rationalisation of the solution of population protection chosen subarea, namely the evacuation of population, specifically identification, register and transfer of this register. The particularised and elaborated solution of either these issues should be the integral part of the primary process of register. First of all the register of evacuated population and its transfer among the particular levels of control always played the significant role in relationship with providing both the primary needs of the population and all the other aspects of providing its emergency survival. There is emphasised mainly the preference of on-line transfer of above mentioned register and other needed data to off-line transfer.

Key-Words: - Awarness, evacuation, identification, population, protection, registration, transfer.

1 Introduction
Nowadays many countries put the great emphasis on the area of evacuation. Within the planning and the very course of evacuation it is, of course, necessary to solve many aspects that involves undoubtedly the register and the identification of the register of evacuated civilians. Although mainly the register (and related transfer) is nowadays implemented, the resources, methods and the proceeding of the register are used just in the standard manner. Certainly, concerning this topic, there could be used such tools that simplify whole system, make it more effective and of higher quality and at the same time these could contribute to increase the interoperability in this field both in the national and the international level.

2 The contemporary problems concerning the personal data protection, the identification, the register of evacuated civilians and its transfer
Within the Czech republic there is an instruction dealing with the topic of emergency survival [1].However this instruction assumes an attitude to the chosen areas as follows:
- it tries to solve the register of the evacuated civilians just by the simplest possible manner;
- it doesn’t address the identification of the evacuated civilians;
- it doesn’t solve the transfer of the register of the evacuated civilians;
- it doesn’t deal with the topic of the personal data protection concerning the evacuated population;
- and it doesn’t look for solution to the security of the transfer of evacuated individuals.
These issues are not at all marginal ones, by contrast. It is necessary to apply to these topics even by reason that the civil evacuation during the crisis situation may have the multinational character. But in fact, there exist many eventualities to solve these problems, some of them and their possible solutions and below mentioned.

3 Problem Solution
To full fill these tasks and the solution of the mentioned sphere of problems have to – in any case -corespond with the content of applicable laws and regulations of individual states affected primarily of these issues.

3.1 The register of evacuated population
The register of evacuated population is solved within the Czech republic through the simple application form that is part of the instruction [1]. Its first copy is left in the area of evacuation (emergency survival) – Level 0, the second copy is sent after filling to main register – Level III and the
third copy is sent to the local level of management – Level I. Based on the structure of the application form the authors of the article have proposed a structure of the content of functional web application – see fig. 1. Below listed in details the individual levels and web application.

![Emergency Accommodation Form](image)

**Fig 1** Form for emergency accommodation – registration of evacuated people (data are fictitious)

Basic information for registration of evacuated persons are:
- first name;
- surname and degree;
- date of birth;
- residence address;
- contact to family members;
- job – specialization;
- medical status – medical drugs which an evacuated person takes either transiently or long-termly.

It is possible to state that all these information are required for registration of evacuated persons and have their foundation. An important information will be a religious preference as well, however its provision is voluntary according the legal regulations of the Czech republic. This data has the significant value in conjunction with the providing a cleric consolation.

It is suitable to interconnect on-line this register with the identification of evacuated persons (the importance of identification see below) and to use for this purpose somewhat instruments instead of filling the form in Microsoft Word or Microsoft Excel program.

### 3.2 The identification of evacuated population

The identification is especially suitable during the stay of considerable number of people in the area of emergency accomodation, mainly for safety reasons. Above all it is concerned the unique, mainly visual determination of citizenship and validity of residence of the evacuated in the particular area. Next, the identification is acceptable e.g. during taking meals, during allocation of the means from humanitarian help, etc.

The identification may be in its essence solved on dual way. Partly through the ID cards containing a licence number, selected personal data whose type or number is limited only by the ID card size (e.g. title, name, surname, date of birth, determined area of movement, etc.), by the signature of responsible person, eventually by the conformation stamp. The ID cards is of course suitable to provide with a photography. However, this expects either to have such a photo along which many evacuated most probably won’t have or to make such photography during the registration of an evacuated person after his/her arrival to the place of emergency accomodation. However this variation expects the possession of digital camera and other software and hardware equipment needed for printing the photographs. Nowadays there are available software utilities (e.g. Microsoft Access as the simplest one) that are able to support very quickly the mix of photographs and ID cards production. It is suitable to laminate these cards from reason of any damage, eventually embarassing the falsification atempts.

The next, but more expensive way is the identification of registered evacuated person through non-contact ID systems, for example:
- smart cards;
- chip bracelets, so called non-contact key pouch of inexhaustible shapes and colors, etc.

The smart cards comparing with the chip bracelets have the advantage that there is possible to lay on the photographs of ID holder on it as on the standard cards. The usage both ID cards and bracelets or key pouches are common part of support of solution of employes entrance in the majority of institutions.

We can see also other advantages in their usage:
- effortless identity check;
- embarassing of falsification;
- simplification of the registration of accepted meals or other allowances, etc.

The number of holders $n_{ID}$ of these cards, bracelets or key pouches in the area of evacuation is not at all limited.

The number of ID card readers $n_{IDCR}$ is determined by need and technical resources of the evacuation areas, theoretically it may be higher than the number of ID card holders but is usually lesser and is given by following relation

$$n_{IDCR} < n_{ID} \quad (1).$$

The possible application of utilization is shown in bottoms of fig. 2

On the other hand this variation requires:
- the higher level of software and hardware utilities;
- the instalation of ID card readers of these non-contact ID systems to all evacuated person’s contact places;
- the connection between the reader and the control computer of evacuation place.

3.3 The transfer of evacuated persons’ data

The existing form of transfer of data of the register of the evacuated is generally the preferred form of off-line transfers, namely through e-mails, instead of on-line transfers within the internet. To this register it is possible to use the created forms – tables partly in Microsoft Word program, however it is more preferable – from the pragmatic reasons - to use Microsoft Excel program, eventually less used Microsoft Access. The mentioned programs are currently standard feature of decisive majority of institutions that would go into the solution of these issues according to valid legal regulations, namely within the Microsoft Office packet. After filling the form it is possible to simply safe and send it, then a recipient will withdraw it from the storage place (in case of power fail he can withdraw the file with the data after connection restoration), eventually the form can be printed and the distribution may be provided by any other suitable way. The disadvantage of such a way of transfer is the fact that after any change of data of evacuated persons it is necessary either to resend the whole changed form or to send the alert of any data change with that the change has to be already applied in the incoming form on the side of recipient [2].

It is also possible to implement on-line transfer of data of evacuated persons. The indisputable advantage is the fact that providing the utility of this transfer (solitary utility is of course important also within off-line transfer), see the subchapter below, which is the main condition of realization of this way of transfer, the recipient has all the time upcoming data from the register of evacuated persons available. [3].

So this transfer can be without problems provided among individual control levels (see fig. 2) that will be represented by the following:

- the tactical level (Level 0 and Level I)
  - the basic control level – the evacuation places
  - the local control level – the local crisis staff
  - the operational level (Level II)
  - the regional control level – the regional crisis staff
  - the strategic level (Level III)
  - the national control level – the national crisis staff
  - the international control level (Level IV)
  - the supranational control level – the international crisis staff

their number $n_{I}$ may be whatsoever.

- the number of the local crisis staff

- the number of the evacuated

- the number of the local crisis staff, in most cases it is however practically lesser and generally is given by the following relation:

$$n_{I} \leq n_{Z} \quad (2).$$

- the number of the national crisis staff

- the number of the national crisis staff, in most cases it is however practically lesser and generally is given by the following relation:

$$n_{II} \leq n_{I} \leq n_{Z} \quad (3).$$

- the number of the international crisis staff

- the number of the international crisis staff, in most cases it is however practically lesser and generally is given by the following relation:

$$n_{III} \leq n_{II} \leq n_{I} \leq n_{Z} \quad (4).$$

- the number of the supranational crisis staff

- the number of the supranational crisis staff, in most cases it is however practically lesser and generally is given by the following relation:

$$n_{IV} = n_{III} \quad (5).$$

All control levels have to be at the same time represented by corresponding number of hardware and software equipped computers that is equal minimum the number.

It is comprehensible that not all control levels need all data of evacuated persons for its activity. Generally it is true – the higher control level, the less number of data is sufficient for its activity, however the number of the evacuated will be always

$$\sum_{i=1}^{IV} n_i = n_{ID} \quad (6).$$
necessary and decisive, namely first of all from the reason of further decisionmaking (planning the humanitarian and other help, etc.).

**Level IV**
- **Supranational control level**
  - International crisis staff

**Level III**
- **National control level**
  - National crisis staff

**Level II**
- **Regional control level**
  - Regional crisis staff

**Level I**
- **Local control level**
  - Local crisis staff

**Level 0**
- **Basic control level**
  - Evacuation place

*Fig. 2 The scheme of evacuated population data transfer*

The essence of on-line transfer could be a server, so called master, placed for example in the regional crisis staff (Level II), eventually in the national crisis staff (Level III) where the web application
cooperating with database of central data stacking works. This server can be connected with terminal computers where the evacuated persons are registered through the personal computers, notebooks, netbooks, etc. or data stations – smart card readers, bracelets, etc. (Level 0). The local crisis staff (Level I) not only keeps summary of the evacuated but also provides especially the material needs for the evacuated situated in the evacuation place. The part of this process may also be ad hoc activated international crisis staff (Level IV) that will at the same time coordinate the issue of evacuation, e.g. during extensive crisis situations that require the evacuation of endangered or already affected persons even in the area of other country.

The simple and real example is possible to find on the web site https://appl.unob.cz/evakuace where the function is best to examine within the connection of more computers to this address in one moment. The computers used for registration of the evacuated are laid low requirements, any webbrowser that is a part of operational system is sufficient. In the environment of the webbrowser there are made the data of a person and these are immediately transmitted to the central server that safe them to a database. All evacuated places and relevant crisis staff use the same database, they have all sent items available immediately and then by the means of other software they may create such information (the files of information) that are necessary for every control level including solitary evacuation place, e.g. formatting to bus, planning food supply, etc. For connection it may be used any internet link (telephone network, cable network, wireless network, GSM network, eventually satellite network). All data communication should be protected against any monitoring and eventual misusage. On the side of server, computers and data transfer protection there may be used standard mechanisms built in operational systems of computers, only usage of several communicational channels, e.g. GSM/GPRS/EDGE/UMTS/HSDPA, requires all ready prepared utility or at least landing its quick delivery.

The evacuated person’s data transfer (thereby so also his/her registration) is nowadays basically soluble also by counting data of a person through machine readable codes from personal ID cards of newer edition or from bands of newer edition as well (including the photographs). However this way assumes that evacuated person has one of these documents along but it can not be taken into account in case of evacuation absent time. Next, this way of data transfer is limited by the need of installation of special code readers. It is also connected with the need of proper software and hardware utilities in places of emergency accommodation.

### 3.4 The security of evacuated person’s data transfer

Nowadays, as it was mentioned above, probably the most frequent way of transfer of register of evacuated persons would be carried out through the internet. However this transfer entails certain diversification that has to be taken into account and that has to be eliminated from the very beginning. Though the internet was originally designed to be effective and resistant, at first no marked security was taken into account. Not until the expansion throughout the world and the offer always new ways of its usage the security elements were applied to net protocols which it was based on. For securing the confidential or sensitive data transfer the computer network, and so the internet, should offer so called security services: privacy, integrity, autentization, nonrepudation, etc. The privacy of transmitted data is ensured at that time when noone incompetent can get acquainted with its content. The integrity means that it is possible to find out any unauthorized intervention of the transmitted data. By means of autentization we are able to pick out competent user and incompetent one by verifying his/her declared identity. The nonrepudation is instrumental to that communicating parties can not deny any of its actions. To implement security services there are practically used security mechanisms, e.g. encryption algorithms, electronical signature and hash function. Over time the internet has became especially more secure also because there were applied mentioned security mechanisms to some of its communicational protocols. To secure the electronical mail there are often used the protocols S/MIME, PGP a SSL/TLS. Protocoles SSL/TLS are also instrumental to secure web transactions – for example they enables to realize the electronical banking and to pay safely through the internet. Protocol SSH is determined to safe connection between two computers through internet. The safe connection between a computer and a corporational inner network is mostly implemented by means of virtual private network technology (VPN) and protocols PPTP, L2TP a IPsec [4].

Some legal rules of European union, e.g. the Directive of the European parliament and the Council concerning the personal data processing and privacy policy in electronical communication branch, [5] etc. again affect the issues of these data transfer.
3.5 The protection of personal datums

These data and its protection belong in democratic countries among the basic rights of their citizens. It should be observed even in case of a crisis situation.

For example, within the Czech republic this issue is first of all embodied in the Document of basic rights and freedoms [6] and also in the law on the protection of personal data [7]. This law, according to the law of European community, international laws which the Czech republic is bound with, and to fullfill the rights of everyone on protection against unauthorized invasion of privacy, regulates the rights and obligations during the processing personal datums and determine also the conditions which the transmission of personal datums to other countries is realized.

It can be stated that relevant authorities in connection with the evacuated persons may gather, process and keep only such information that they need for their activity in conjunction with the support of these people (providing the humanitarian and other help, welfare, etc.) and whose own use they are able to justify. Many regulations within the European union affect the protection of personal datums. Among the most important ones it can be mentioned, e.g. the directive of the European parliament and the Council [8], the agreement on the protection of individuals considering the automated processing of personal data [9] including the additional protocole [10] etc. All these mentioned regulations have the only one task – to contribute to ensuring the protection of these datums and to prevent its abuse.

4 Conclusion

It should be – both theoretically and practically - paid the same attention to evacuated population in conjunction with its register and identification, transfer of this register and protection of personal datums as to all other parts of this precausion. This issue may become very effective and useful support within the solution of crisis situations by eventual cohesion of the register of population that is being prepared in the Czech republic and is fully working in some other countries. There is still a straddle question – the eventual compatibility of conducting the register within the countries e.g. of the European union (there especially in conjunction with crisis situations of nonmilitary character) that is meanwhile missing. The Czech republic has a conclusion of a treaty about cooperation and collaboration during the extraordinary events, disasters, big accidents or calamities with all the adjoining states. These treaties enable the evacuation of endangered or already affected persons even to the area of neighbouring state when the above mentioned events occur. In certain circumstances the eventual mentioned compatibility of systems of register of the evacuated may facilitate the solution of this issue in a marked way.

References:


[8] The Directive of the European parliament and the Council 95/46/EC, on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

[9] The Message 115/2001, on accepting the Agreement on the protection of individuals with regard to the processing of personal data.

[10] The Message 29/2005, on conclusion of Additional protocole to the on the protection of individuals with regard to the processing of personal data and on the authorities of control and data flow through the boundaries.