

THE ROLE OF IT IN EMERGENCY MANAGEMENT: INTEGRATED INFORMATION INFRASTRUCTURE OF THE STATE AGENCY FOR CIVIL PROTECTION

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Abstract: In this article, the Chairman of Bulgaria's State Agency for Civil Protection describes recent accomplishments and plans for implementation of information and communications technologies in support of emergency management activities in a multi-agency and international setting. A particular emphasis is placed on IT and organizational arrangements to increase radiological safety.

Keywords: Emergency Management Architecture, Information Management, Command and Control, Natural Disasters, Man-Made Disasters, Radiological Safety, ECURIE.

The extensive development of information technologies (IT) in the last few decades gave rise to numerous new applications. In the areas of general protection of the population and emergency management in the event of natural or man-made disasters, advanced IT allow for the development of new and more effective implementation of traditional functions.

One example relates to the process of risk assessment and evaluation of potential hazard, which presupposes employment of advanced methods and tools for analysis and modeling. The introduction of up-to-date techniques for collecting, processing and handling data in support of the decision-making and emergency management plays a major role for the success of the preventive activities and to the prompt response to natural and technological disasters.

The objective for the setting up and functioning of the Civil Protection Information System¹ is to provide for effective collection, processing and distribution of data, analysis and assessment of chemical, biological, hydro-meteorological crisis situations, as well as situations related to traffic, fire or radiation including natural disasters, technological incidents and traffic accidents.

The Information System is structured at four levels:

- First level – National Government (through the Standing Committee for Protection of the Population in the Events of Major Natural and Man-Made Disasters /SCPP/ under the Council of Ministers; the National Situation Center at the State Agency for Civil Protection (SACP), ministries and agencies);
- Second level – district administrations;
- Third level – municipalities;
- Fourth level – peripheral (high-risk industrial or business facilities, power stations, sensitive points, research sites, observatories, warning and alert systems, etc.).

The communications infrastructure includes the existing *Matra 6501* digital communications system and establishment of 30B+D (2 Mbps) high-speed primary access to the *Integrated Services Digital Network (ISDN)* of the Bulgarian Telecommunications Company. The integration of our information system to the Network of the State Administration is also feasible. Thus, the communications infrastructure provides for speedy and reliable exchange of voice, data, text messages, geographic information and images among the ministries, central agencies and local administrations.

In this context, one of the objectives of Bulgaria's State Agency for Civil Protection is through modern and effective management and utilization of advanced IT to meet the requirements of the Bulgarian society at any time and any place.

The massive introduction of new IT in the state government, as well as the launching of e-Government as a comprehensive reforming movement to encourage Internet use by government agencies and provision of on-line services leads to:

- Change in the expectations and the functioning of the administration and the society;
- Integration of various administrative levels and organizations in one united virtual establishment.

The State Agency for Civil Protection exploits the potential of the State Administration National ATM Network (SANATMN) development. This is an integrated communications services network, fully based on optical communications to ensure high reliability and investment savings, as well as high speed data transfer through the network – 155/622 Mbits, at no cost to the SACP.

SANATMN provides:

- Free data transfer;

- Storage and use of information by all territorial structures of the Agency;
- High level of information protection and authentication;
- SACP's Regional Directorates gain a possibility to connect their local networks with the Central Administration;
- E-mail services;
- Free Internet access (for the Agency);
- Access to international and Bulgarian information systems;
- Updating the information systems and data transferring;
- Transfer of financial resources.

A number of components of the information system have already been established at the level of the Agency (SACP headquarters):

- A local computer network serving 85 users;
- Software to exchange and processing of document;
- IT training courses for the Personnel of the Agency.

In addition, each regional Directorate of SACP has connected its PCs in a local network, which in turn is connected to the optical ring of the respective regional administration. That allows for the exchange and use of the information resources of other organizations of the regional administration.

All 28 regional centers have already been connected. An ATM optical connection between the cities of Sofia, Pazardjik, Plovdiv, and Blagoevgrad has also been established. As a result, the Regional Directorates in Sofia, Pazardjik, Plovdiv and Blagoevgrad are fully connected to the Network of the State Administration. Thus, these directorates can exploit the resources of the central server, administrated by the system administrator of SANATMN.

In compliance with the *Rules on the Organization of Emergency Response and Elimination of the Consequences of Natural and Man-Made Disasters*, radio communications systems for mobile, operative and emergency communications have been built in the districts of Stara Zagora, Bourgas, Plovdiv, Kardzhali, Haskovo, Varna and Dobrich. These systems are designed to meet the needs of the Civil Protection Agency and the Standing Committee for Protecting the Population and to support the management of search and rescue (SAR) operations in the event of disasters or other emergencies.

In order to improve the organization and the coordination of SAR and recovery activities during emergencies, SACP and its regional structures need to establish radio

communications systems in the remaining regions of the country,² as well as to connect these systems to the regional/ local systems of other ministries and agencies.

The problem will be ultimately solved by setting up a comprehensive system that fully utilizes the potential of advanced technologies and radio communications standards (TETRA) and the appointment of an authorized operator of that system. The operator should be competent in national security issues. Thus, compatibility in the exchange of voice, data, geographic information and images from the disaster-stricken area would be achieved, as well as interoperability of specialized emergency teams and forces under different jurisdictions.

The tendency of extending the application of IT to a larger spectrum of human activities, e.g., research, management, planning, etc., corresponds to the increasing understanding of the need to develop and implement variety of information and communications systems in support of the overall process of prevention and protection of the population.

The Geographic Information Systems (GIS), being an integral component of the IT systems, possess great potential as a powerful tool for area measurements and registration of events in disaster locations, emergency management, statistics, search and rescue operations, environmental protection, communications, etc.

In compliance with the *International Danube River Convention*, signed in 1994, a Program on the Protection of the Danube River Environment was adopted in 1999 and a common *Emergency Notification and Alert System for the Danube River Basin* was set up. The Danube River disaster and incident warning system provides for:

- Timely acquisition, processing and transfer of information on an incidental pollution of the Danube River water with potential trans-boundary effects;
- Timely notification of the Danube states with the purpose of danger reduction, identification of the source of pollution, damage handling and elimination of further losses, and provision of information to the public.

By a decision of the Danube Secretariat in Vienna, already thirteen Principal International Alert Centers (PIAC) have been installed, respectively in Germany, the Czech Republic, Hungary, Slovakia, Slovenia, Romania, Moldova, Austria, Ukraine (2), Bulgaria and Bosnia and Herzegovina.

The basic operational unit of the system is the International Alert Center, which is responsible for collecting and processing information, decision-making and coordinating international cooperation. The technical equipment of the International Alert Center includes computer hardware and software as well as INMARSAT-C satellite transceiver.

Since 1997, the Ministry of the Environment and Waters, the State Agency for Civil Protection, and the Nuclear Regulatory Agency have been using the National Automated Radiation Monitoring System (RAMO). The system has the following components:

- Central Monitoring Station (CMS) at the Executive Agency on Environment and Waters;
- Mobile Monitoring Station;
- Regional Monitoring Stations;
- Response Cell at the Situation Center of the State Agency for Civil Protection;
- Local Monitoring Stations;
- Control Monitoring Points at the SACP and the Nuclear Regulatory Agency.

Dial-up connections and radio channels are used to provide information exchange among the components of the system. The software allows the reception of current visual operational information, updates on the evolution of the radiation levels and signal indication of change in the background radiation. Usually, ten minutes is the shortest time interval for updating the information coming from monitoring stations to the CMS server. The measurement and report interval should be shortened to two minutes if the radiation background is increased. Since 2002 the RAMO system has been integrated with the Off-Site Radiation Control System of the *Kozloduy* Nuclear Power Plant.

The projected extension of the system would include:

- Additional local monitoring stations in the south-eastern part of the country to complement the system. The aim is to register potential tritium pollution in case of release as result of the operation of *Cherna Voda* Nuclear Power Plant in Romania;
- Using the full capacity of the available doze rate meters—the RIT display boards installed at the municipalities—by connecting them to the radiation control system in a fully automated manner.

In addition, on September 11, 2003, the Council of Ministers decided that Bulgaria will join the ECURIE system. ECURIE stands for European Community Urgent Radiological Information Exchange. Under the ECURIE agreement, Bulgaria's Nuclear Safety Agency is nominated as competent body and primary point of contact, while the State Agency for Civil Protection serves as a second contact point.

The ECURIE system is based on Decision 87/600/Euratom, which provides for the early exchange of information in the event of a radiological emergency. Its function-

ing is based primarily on the exchange of coded telex messages between designated contact points. The ECURIE arrangements include routine testing of communications hardware and emergency communications procedures.

The system meets the following basic requirements:

- The system must be continuously accessible – 24 hours a day;
- It must be highly reliable;
- The system must provide for a high degree of information protection;
- The system should provide for the rapid exchange of information throughout the Community;
- The system must account for all languages used throughout the Community;
- It should allow for the transmission of one message to many contact points;
- At least a preliminary version of this system must be implemented quickly;
- The system must include suitable procedures for handling data provided to the Commission by a Member State in confidence;
- While the system must primarily provide for exchange of the information required under the Council Decision, it is desirable that such a system should have application in the context of other legal provisions of the Community that relate to the exchange of emergency (radiological) information.

Contact points have been established for all Member States and for the Commission. These contact points are accessible twenty four hours a day. Valid ECURIE messages received by the Commission will, subject to certain confidentiality provisions, be forwarded to the contact points of all Member States.

In conclusion, there is no doubt that advanced information technologies play a significant role for the success of crisis management and post-disaster recovery missions. The extended range of IT applications will facilitate the decision-making process and the efficient coordination and cooperation on both national and international levels.

Notes:

- ¹ For the functions of the State Agency for Civil Protection and other state, regional and local institutions the reader may refer to Vladimir Petrov, “The Institutional Framework of Crisis Management in Bulgaria,” in *Managing Political Crises in Bulgaria: Pragmatism and Procrastination*, eds. Kjell Engelbrekt and Markus Förberg (Stockholm: Swedish National Defence College, 2005), 27-41. Additional information is available at the website of Bulgaria’s State Agency for Civil Protections, www.cp.government.bg.
- ² Commercial-off-the-shelf technologies provide flexible and efficient opportunities that have been successfully tested in national and international emergency management exercises, conducted by SACP. For details see Stoyan Avramov, “Integrating COTS Technologies into a Scalable Mobile Emergency Command Post,” *Information & Security: An International Journal* 10 (2003): 87-96, <http://cms.isn.ch/public/docs/doc_544_259_en.pdf> (12 April 2005); Velizar Shalamanov and Stoyan Avramov, “Ruggedized Commercial IT Modules for Field C2 Posts in Coalition Operations and Emergencies,” in this volume of I&S.

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