



Name: GIES
Responsible: Col. Francisc Senzaconi
Contact: senzakof@mai.gov.ro



Name: DGFSCP
Responsible: Chief Inspector Lyudmila Simeonova
Contact: simeonova@gmail.com



Name: INRNE - BAS
Responsible: Dr. Maria Manolova
Contact: manolova@inrne.bas.bg

www.emersys.eu

INVESTING IN YOUR FUTURE!

Romanian-Bulgarian Cross Border Cooperation Programme 2007-2013 is co-financed by the European Union through the European Regional Development Fund.

Project title: "Toward an integrated, joint cross-border detection system and harmonized rapid responses procedures to chemical, biological, radiological and nuclear emergencies" MIS-ETC Code: 774

Editor of the material:
Directorate General for Fire Safety and Civil Protection (DGFSCP)

Date of publishing: June 2015
The content of this material does not necessarily represent the official position of the European Union

www.cbcrromaniabulgaria.eu



GOVERNMENT OF ROMANIA



GOVERNMENT OF BULGARIA



Toward an integrated, joint cross-border detection system and harmonized rapid responses procedures to chemical, biological, radiological and nuclear emergencies MIS-ETC Code: 774

www.emersys.eu

DIRECTORATE GENERAL
FIRE SAFETY AND CIVIL PROTECTION - MoI



Implementation of an adequate, well-structured system that provides reliable detection and real-time notification is of outmost significance for an effective and timely response in emergencies resulting from industrial accidents, and is a prerequisite to further implementation of a realistic civil protection policy.



Common borders. Common solutions.

About EMERSYS

A Decision Support Tool having access to, and using in an integrated manner, data from the entire cross-border area (regardless of physical country border) serves as a powerful tool to responsible authorities to implement countermeasures within a time compatible with that needed to protect the population. Also offers better coherence and transparency in the decision processes on local and border-crossing interventions as one input to improving public understanding and acceptance of off-site measures.

The BG-RO cross-border area concentrates the two countries' energy production capabilities based on nuclear technology (Cernavoda and Kozloduy NPPs), as well as important activities and industrial facilities having a high potential of risk due to routine handling of dangerous substances.

The recent process of technological risk identification at the border between Bulgaria and Romania (required by the SEVESO II, Directive 96/82/EC) shows that the main hazards in the cross-border area, comes from fertilizer industry, transport of dangerous substances, storing of petrochemicals, power supply and water treatment.

The necessity of implementation of core infrastructure for TIC detection in the cross-border area, resides in the requirements of fulfilling the obligation imposed by the 96/82/EC Directive (SEVESO II) and by the UNECE Convention on trans boundary effects of industrial accidents (signed by both Bulgaria and Romania).



The large part of the funds allocated has been used for the purchase of equipment and specialized software destined to DGFSCP from Bulgaria and GIES from Romania in order to improve the technical capabilities for detection, assessment and forecasting in chemical, biological, radiological and nuclear emergency situations. Intervention teams for CBRN emergency situations in the districts/counties from the Bulgarian-Romanian border shall use the same type of equipment, a joint platform for data exchange and communication shall be implemented, national plans for intervention in CBRN emergency situations shall be harmonized, as well as the coordination of their implementation. Local and national communities shall get informed periodically on the new technical, logistic and organizational capabilities in the field of intervention in case of CBRN emergency situations. The two national institutes in the nuclear field from Bulgaria and Romania ensure the theoretical and practical training of DGFSCP and GIES members, prepare methodical guides and work instructions for the use of the purchased equipment. The publishing of scientific articles in the field of intervention in case of CBRN emergency situations and in related fields is another goal of EMERSYS project (for details see www.emersys.eu), as a dissemination of results from the project.

General objective

Provide authorities from the entire Romanian-Bulgarian cross-border area with means for the coordinated implementation of European Community strategies and legislation, as well as bilateral-Conventions, regarding emergency preparedness, planning and intervention in case of chemical, biological and radiological/nuclear (CBRN) emergencies.

The EMERSYS project is dedicated to streamline coordination between emergency authorities from the BG-RO cross-border area in practical implementation of legal and political undertakings (SOVESO II, ECURIE, UNICE Convention on trans boundary effects of industrial accidents), by providing effective means for a more harmonized emergency management of the local and regional levels, based on a common perspective approach.

The project focuses on creation of a unitary emergency infrastructure for early detection and intervention related to chemical and nuclear facilities, as well as biological and radiological situations of major risk from Bulgarian-Romanian cross-border area. In the event of an emergency with off-site effects, this will enable for the rapid detection and notification of releases, the monitoring of the progression of an accident from the moment of detection, to forecasting and estimating the ongoing and the potential releases, as a function of time.

The EMERSYS project will put in place a system that joins forces, shares resources and eliminates duplication of national efforts related to CBRN events, providing thus for an economically efficient and sustainable, rapid cross-border response force, benefit of the population from the cross-border area.



Specific objectives

1. Enhance the technical capability for detection and notification of CBRN events with potential trans-boundary effect and implementation of a joint decision support tool at the level of all Directorates for Fire Safety and Civil Protection/Emergency inspectorates from the cross-border area.
2. Integrate the newly created infrastructure and existing national early-warning systems and interconnect the Directorates for Fire Safety and Civil Protection/Emergency inspectorates from the cross-border area by setting-up a platform for bilateral and on-line exchange of information related to hazardous and radioactive substances.
3. Harmonize local plans and procedures for off-site intervention in case of major chemical accidents, biological and radiological/nuclear emergencies and development of collaboration plans and protocols.
4. Enhance the emergency expertise from the cross-border area by training the operational staff.
5. Raise public awareness in the cross-border area related to technological risk.

Training courses

One of the activity planned to be implemented in the framework of the EMERSYS project “Toward an integrated, joint cross-border detection system and harmonized rapid responses procedures to chemical, biological, radiological and nuclear emergencies”, code MIS-ETC 774, is training of the operational staff.

Responsible to organize the Training Course T1 on “Chemical and Biological Emergency - theoretical aspects”, was the Institute for Nuclear Research and Nuclear Energy- INRNE-P4, Bulgaria and to organize the Training Course T2 on “Radiation Protection in Radiological and Nuclear Emergency - theoretical aspects” was the Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering - IFIN-HH - LP, Romania.

Operational staff in CBRN emergencies situation was from General Inspectorate for Emergency Situations-GIES Romania (P2) and Directorate General for Fire Safety and Civil Protection (DGFSCP)-P3 Bulgaria.

The Training Course T1 on “Chemical and Biological Emergency - theoretical aspects”, and the Training Course T2 on “Radiation Protection in Radiological and Nuclear Emergency - theoretical aspects” were held in Sofia, Bulgaria, on December 2-7, 2014, having as objective to enhance the emergency expertise from the cross-border area by training the operational staff. Its target was the staff of the emergency management responsible authorities having attributions in the field of chemical, biological, radiological and nuclear emergencies.

For a clear understanding of the specific hazards and risks associated with chemical, biological, radiological or nuclear (CBRN) emergencies and of how they are to respond to CBRN emergency situations, the following topics were addressed:



Chemical and Biological Emergencies

1. Chemical weapons

- a. Lethal agents: nerve, blood and choking agents
- b. Harassing agents: tear, vomiting agents
- c. Incapacitating agents: psychological agents, riot-control



1. Biological agents: basic characteristics

- a. Types of biological agents
 - Toxins
 - Bacteria
 - Viruses
 - Molds

2. Biological agents as a tool for terrorism

- a. Biological war types

3. Biosafety and biosecurity

- a. General strategy
- b. Protection level
- c. Proposed methods for biological protection
- d. Evaluation of biological risk
- e. Individual protection equipment
- f. Biosecurity components
 - Physical protection
 - Protection of personnel
 - Protection of information
 - Transport protection



Radiological and Nuclear Emergencies

1. Ionizing radiation - basics
 - 1.1. Introduction.
 - 1.2. Basic physics used in radiation protection.
 - 1.3. Interaction of radiation with matter.
2. Biological effects of ionizing radiation
 - 2.1. Effects of radiation at the molecular and the cellular level.
 - 2.2. Deterministic effects.
 - 2.3. Stochastic effects.
3. Dosimetric and radiation protection quantities
 - 3.1. Dosimetric quantities and units.
 - 3.2. Radiation protection quantities.
4. Radiation detection and measurement
 - 4.1. Principles of radiation detection and measurement.
 - 4.2. Radiation detectors.
5. Nuclear reactors. Nuclear accidents
 - 5.1. Nuclear reactors.
 - 5.2. Nuclear accidents.
6. Radioactive sources and radiological devices - examples and identification
 - 6.1. Identification of a radioactive source, device or transport package.
 - 6.2. Categorization of radioactive sources. Examples.
7. Radiological accidents. Case study

- 7.1. Radiological accidents.
- 7.2. Case study.
8. International and European framework for radiation protection - regulatory system
 - 8.1. Principles of radiation protection.
 - 8.2. The role of international organizations in radiation protection.
 - 8.3. Regulatory control.
9. Intervention in emergency exposure situations. Risks associated with radioactive sources. Contamination and decontamination
 - 9.1. General principles and types of events.
 - 9.2. Basic concepts for emergency response.
 - 9.3. Basic concepts for emergency preparedness for a nuclear accident or radiological emergency.
 - 9.4. Risks associated with radioactive sources.
 - 9.5. Contamination and decontamination

The Training Courses were attended by Lead Partner, Partner 2, Partner 3, Partner 4 representatives and operational staff (40 participants) from Emergency Situations Inspectorates of Calarasi, Constanta, Dolj, Giurgiu, Mehedinti, Olt, Teleorman Counties and Fire Safety and Civil Protection Directorates of Dobrich, Montana, Plevne, Silistra, Ruse, V. Tarnovo, Vidin and Vratsa Regions.

After the training session the trainees were tested and evaluated.

Training Sessions 4 and 6

The main goal was to have a better understanding of the risk concept, probabilistic safety assessment, CANDU reactor, decision support systems and their use in the evaluation of radiological consequences and countermeasures to mitigate the impact on population and environment.

The risk concept was discussed with an accent on identification, assessment, prioritization and management. Further particularization of the concept of nuclear risk was presented with examples related to nuclear energy, types of nuclear risks, International Nuclear and Radiological Event Scale (INES), Nuclear Accident Magnitude Scale (NMAS); having the objective of classification of nuclear events and the unpredictable events, facing the threat from unauthorized nuclear activities or otherwise.

Nuclear risk assessment had the objective to provide the main concept for probabilistic safety assessment (PSA), which offers a systematic approach to determine as final target the source term of a radioactive release in the environment.

Furthermore the basic information about CANDU 6 reactor was presented, followed by a PSA application of this reactor type and analyze the possible severe accidents.

The training session was finalized with theoretical and practical exercises with software tools used in Radiological/Nuclear emergencies assessment.



The purpose was to know how data and information are exchanged in the event of radiological/nuclear emergency in Europe, presentation of the formats for emergency notifications and, also, the role and the place of the computer applications. The assessment of the radiological consequences of a radioactive release from a nuclear facility or otherwise by using "Decision Support Systems" (DSS) was presented. Practical exercises with software tools (e.g. HotSpot Expert System, N-WATCHDOG Expert System, RODOS Expert System) for radiological and nuclear emergency assessments were performed; practical examples being focuses on the understanding of the results of such tools in taking the emergency countermeasures.

The "Theoretical and practical training on use of radiological and nuclear detection equipment" (Training Session 6) had the purpose to present radiological and nuclear equipment used in detection of ionizing radiation, utilization and collecting/writing data measured, analyze and submit the obtained information.

The session was focused on the principal characteristics of instruments used for the detection and the measurement of the ionizing radiation, underlining measurement of the dose and related quantities; the activity and related quantities; radionuclides identification; finding/screening the radioactive sources; alarm thresholds; intrinsic error; energy range of the detection radiation; environmental and electric power conditions for operating and storage of the instruments; legal requirements for the measuring instruments; general requirements regarding the on-site measurement; utilization the printed forms and fill with measured data.

Training Courses 3 and 5

During 23 – 28 February 2015 in Rila Hotel in Sofia training courses T3 and T5 were carried out. The subject of course T3 was "Planning for CBRN", while the T5 course had a subject "Use of CB detection equipment". This training was organized by the Institute for Nuclear Research and Nuclear Energy (INRNE) of the Bulgarian Academy of Sciences (BAS) as a Partner 4 in the EMERSYS project "Toward an integrated, joint crossborder detection system and harmonized rapid responses procedures to chemical, biological, radiological and nuclear emergencies" MIS-ETC Code 774. The project is under Romania-Bulgaria Cross Border Cooperation Programme 2007-2013 and is co-financed by the European Union through the European Regional Development Fund. Totally there were 37 trainees, from which 21 from Bulgaria and 16 from Romania. They represented the regional services and subdivisions of the Directorate General for Fire Safety and Civil Protection within the Bulgarian Ministry of Interior, the General Inspectorate of Emergency Situations in Romania and INRNE.



The T3 course was devoted to the understanding of the emergency planning in general. The principal lecturer was Lyudmila Simeonova, Head of CBRN Department, Directorate General for Fire Safety and Civil Protection, Ministry of Interior, Bulgaria, and Project Responsible on behalf of Partner 3 in the EMERSYS project. Georgi Kashinov, Vise-Director of the Department "Organization Preparation for Mobilization" in the Bulgarian Ministry of Interior was the other lecturer in T3 Course. The trainees became familiar with the main concepts in the emergency planning, as well as briefly with the Bulgarian national CBRN disaster protection plan. Besides they were informed about key points on organization and governing in the Ministry of Interior in cases of emergency situations, including those in Kozloduy Nuclear Power Plant and operational procedures in these cases, as well.

The main task of T5 course was the theoretical and practical training on use of CB detection equipment. The trainees were taught how to use this equipment in case of contamination with chemical and biological substances.



First, they were introduced to the purpose, technical data and structure of principal devices, namely, gas detector Dräger X-am 5000, system for multiple integrated sample analysis, individual preventives (CBRN protective suit Saratoga, gas-tight suit Dräger CPS 7900, full face mask for professional use Dräger X-plore 6530, air breathing apparatus Dräger PA 94 Plus basic) and to the use of these devices, as well. Lecturers were Djina Berova and Borislav Mironov from the Center for Professional Qualification in the Regional Department Fire Safety and Civil Protection in Montana, Bulgaria. The training finished with evaluation questionnaires filled by the trainees and concluding remarks have been made. Each of the trainees received a certificate for a successful termination of the courses.



EMERSYS



www.emersys.eu