The International Emergency Management Society

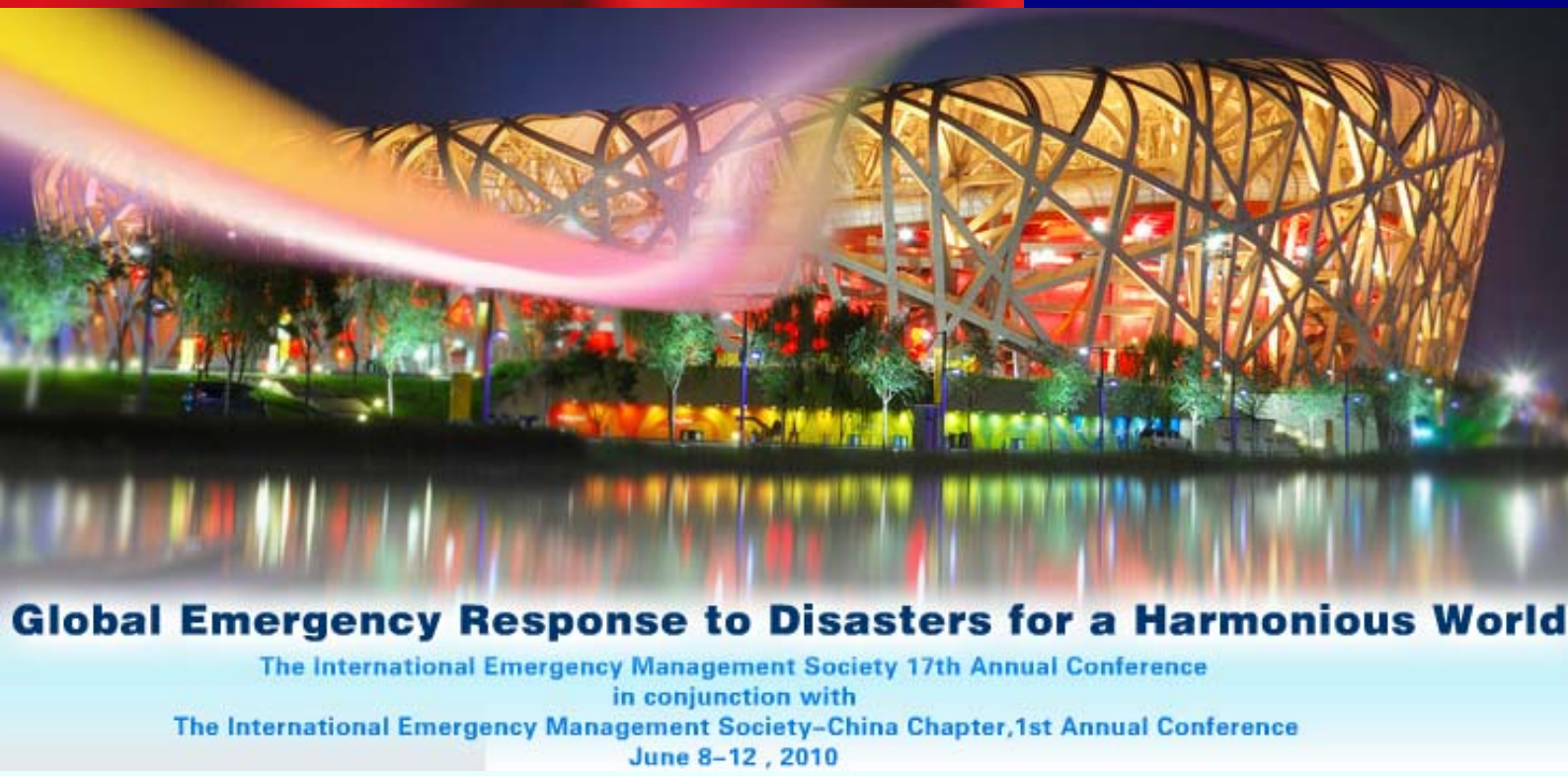
Members Newsletter – Issue 11 – May 2010

歡迎
(Welcome)

TIEMS 17th Annual Conference, Beijing, China

TIEMS 2010 Latest News / Update

Also in this issue:



A warm welcome awaits you in Beijing for the 2010 TIEMS Annual Conference

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Message from the President

Presidents Message

The volcanic activity in Iceland, and resulting ash cloud spreading over Europe hampering the air traffic, and leaving passengers stranded, has been an unlikely event for emergency managers in the region, but again demonstrates our need to look ahead for new challenges, and be prepared for such natural disasters, and do our utmost to prepare for and reduce their consequences.

The earthquake in Chile recently was one such challenge, which unfortunately resulted in us needing to postpone the planned TIEMS workshop in Santiago de Chile (13th-14th April). A new date later in the year is however already being negotiated and will be advertised once the Chilean authorities have had the opportunity to assess the situation and appropriate arrangements can be made.

The latest earthquake in China, from which there are now a reported 2000+ causalities is another tragic event for the Chinese people, who are still recovering from the major earthquake of 2008 in Whenchuan. Many TIEMS members have since been active supporting the response to devastating quake including our TIEMS host for the Beijing annual conference, Qu Guosheng, as a member of the China International Search and Rescue Team (CISAR). Despite this however the TIEMS annual conference in Beijing we are happy to confirm will still go ahead in June this year.

So how can we as TIEMS contribute to improve the alertness for such disastrous events and improve the ability of the emergency organizations to quickly move in and help? And how can we as support communities to be prepared for the potential hazards facing their community to reduce their consequences?
The upcoming TIEMS annual conference in Beijing 8th – 12th June 2010 is focusing on all these issues, and offers international experts in emergency and disaster management the opportunity to meet and exchange experiences and solutions that can improve international preparedness.

It is expected there will be more than 600 participants at TIEMS 2010 in Beijing, and with a full program of keynotes, technical papers, posters, workshops and an exhibition an event not to be missed. As well as a comprehensive program of more than 100 presentations, participants will also have the unique opportunity during the conference to visit the new China National Training Base for Urban Search and Rescue. This facility, is largest of its type in Asia offers earthquake simulation, and the chance to actively test seismic emergency rescue drills, so you can become part of the action.
To ensure your five days at the TIEMS annual conference 2010 in Beijing are memorable, a full programme of social events showing you to some of china's ancient culture, has also been developed, offering an further opportunity to get to know you new found colleagues and friends from the conference.
As in previous years a number of papers from this years proceedings will be selected for publication in a special edition of the International Journal of Emergency Management (IJEM). For the first years the conference Proceedings will also be submitted to Thompson Reuters to consider enrolling them into the Index to Scientific and Technical Proceedings, and hopefully making this a standard for the future.

The Chinese have a long experience with natural disasters, and connection with TIEMS an example being the report "Natural Disaster Mitigation – A Scientific and Practical Approach", published in December 2009, which I and several board members have actively participated in

contributing to, and is recommended reading to TIEMS members with interest an in natural disasters like earthquakes, tropical cyclones, storm surges, floods and droughts to name but a few, and mitigation strategies, and will shortly be available through our continuously improving website

Moving around the world with TIEMS annual conferences, TIEMS is able every year, to focus on one region and offer new insight to many of some of the innovative work such as that highlighted above and inviting delegates to exchange experience with the local experts of the host region. This is and the continuing activity around chapters continue to contribute to a growing international network of experts, and hope you will join us to stimulate further international dialogue on emergency management.

K Harald Drager

Editors Welcome

Editors Message

Welcome to the second edition of the TIEMS newsletter in 2010. Inside this issue, we offer members detailed information on our forthcoming event of the year, the TIEMS Annual Conference in Beijing, as well as updates from our TIEMS Romanian, Indian and Latin American Chapters.

We are also pleased to announce a Croatian - Japanese scientific cooperation in the field of disaster management, presenting the new Asian Disaster Preparedness Center.

As always the newsletter also contains some interesting articles this time on earthquakes, tidal waves and volcano eruptions, to wet your appetite ahead of our annual conference.

We hope you enjoy reading this issue, and welcome your comments, suggestions and hope this issue will motivate you to contribute to the future issues.

Snjezana Knezic

Alan Jones
Technical / Sub Editor

Global Emergency Response to Disasters for a Harmonious World

The International Emergency Management Society 17th Annual Conference
in conjunction with
The International Emergency Management Society–China Chapter,1st Annual Conference
June 8–12 , 2010

TIEMS 2010

17th Annual Conference, Beijing, China

8th – 12th June 2010

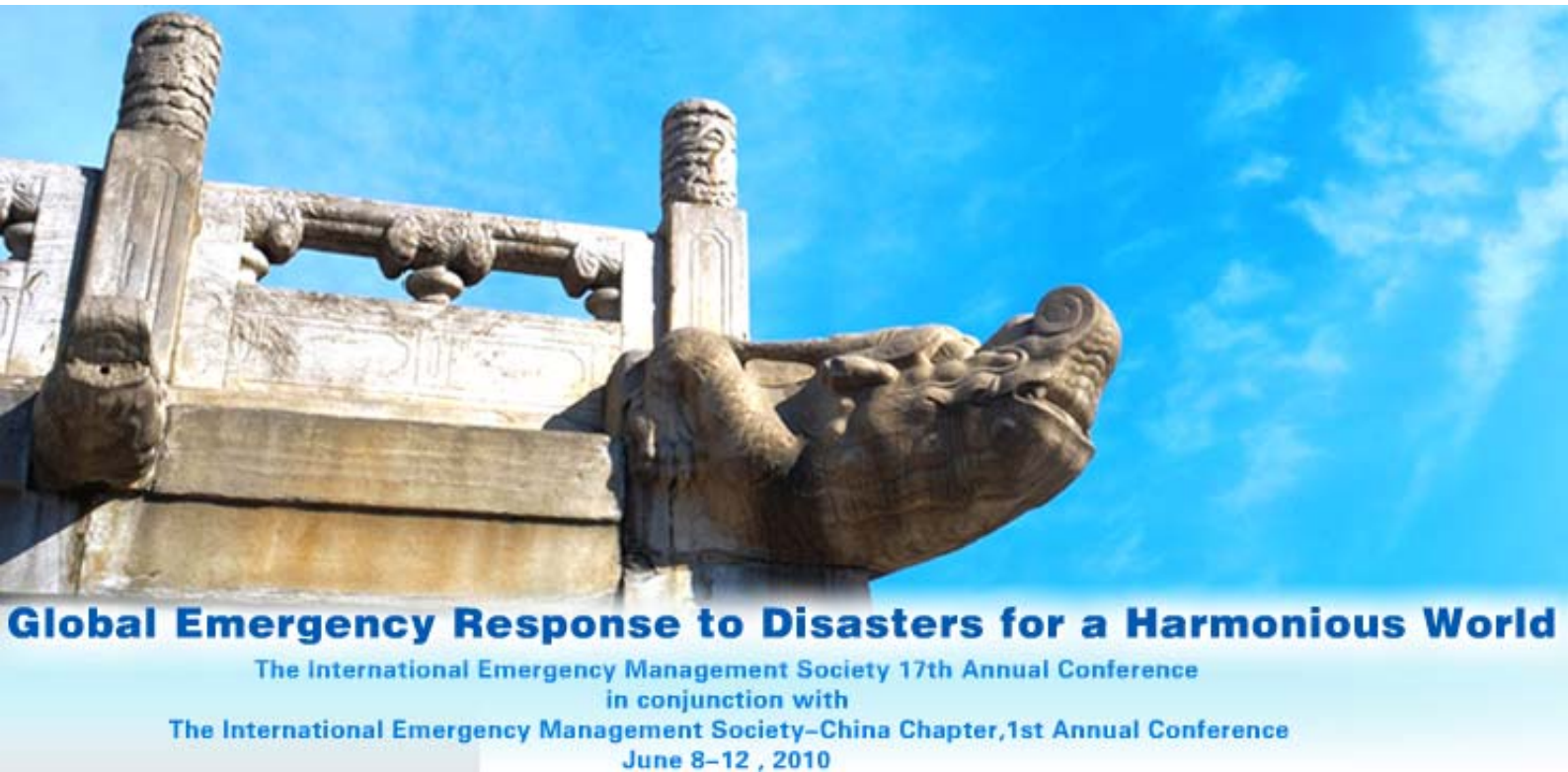
Global Emergency Response for a Harmonious World

TIEMS 17th Annual Conference will take place at Loong Palace Hotel & Resort, Beijing (www.loongpalace.com) between 8th – 12th June 2010. The event as ever, promises to be a captivating one, and we expect over six hundred participants from all over the world to attend.

The year 2010 has started with a series of natural disasters areas across the world, reminding us how important is to build a "Global Emergency Response", to ensure that international resources are truly coordinated. Each country faces its own threat, and China is no different, located in one of the most active seismic regions of the world, with more than sixty major tectonic zones. China's past is as a result plagued by devastating earthquakes. The last strong earthquake shook China on 15 April 2010 and registered 7.1 on the Richter scale, causing widespread damage along the Tibetan Plateau and took to lives of a 500 citizens.

This year, two Scientific Committees, one TIEMS International and one TIEMS China Chapter have peer reviewed over one hundred papers (52 English / 50 Chinese), and have put together a though provoking programme and conference proceedings from which participants will learn about the latest techniques, equipment and theories, and discuss important matters of interest to global emergency management professionals covering the following topics:

- Risk assessment and management / risk analysis simulation techniques
- Establishment of emergency management systems
- National infrastructure protection
- Emergency management case studies
- Response to natural disasters and emergency accidents
- Role of NGO in emergency management
  Training and drill/strategies, tactics, and tools for mass casualty incidents
- Information and communication technology in emergency
- Integrated communication solutions
- Transportation security, emergency management and technologies



- Workshop: Public Health Emergency Effective Response to Cross-border Epidemics
- Counter terrorism, fire fighting and safety
- Application of spatial technology in emergency management

This year we are also pleased to announce the following keynote speakers who will address the conference:

Terje Skavdal, Director of Asia-Pacific, UN OCHA, Thailand
"Disaster Risks, Trends and Challenges in Asia"

Shan Chunchang, Counsellor of China State Council; Director of Emergency Management Specialist Group of State Council China, China
"Organization and Operation of China's Emergency Management"

Song Jiahui, Rescue and Salvage Bureau of the Ministry of Communications, China
"The Situation and Development of China Professional Rescue and Salvage in Sea & Air Area"

Jeppe Jepsen, Motorola, Belgium
"Dedicated Spectrum for Public Safety Communication – A Global Overview"

Fang Weicheng, Academician of Chinese Academy of Engineering

Zafar Shah, District Emergency Officer Punjab Emergency Service, Pakistan
Disaster Risk Reduction Strategy for Urban Earthquake

Huang Jianfa, Chief Secretary for Earthquake Emergency Rescue, China Earthquake Administration

Young Jun Jeong, General Director, Ministry of Public Administration and Security, South Korea

Meen B. Poudyal Chhetri, General Secretary Nepal Centre for Disaster Management, Nepal
"Effects of Climate Change: A Nepalese Perspective"

Gen N C Vij, Vice Chairman, National Disaster Management Authority, India

Qu Guosheng, TIEMS Regional Director for Asia & Pacific, China
"Emergency Respond, Rescue and Recovery for Catastrophe"

Chen Xinyou, Mayor of Deyang City in Sichuang Province, China
"Emergency Response to Wenchuang Earthquake and post-disaster reconstruction"

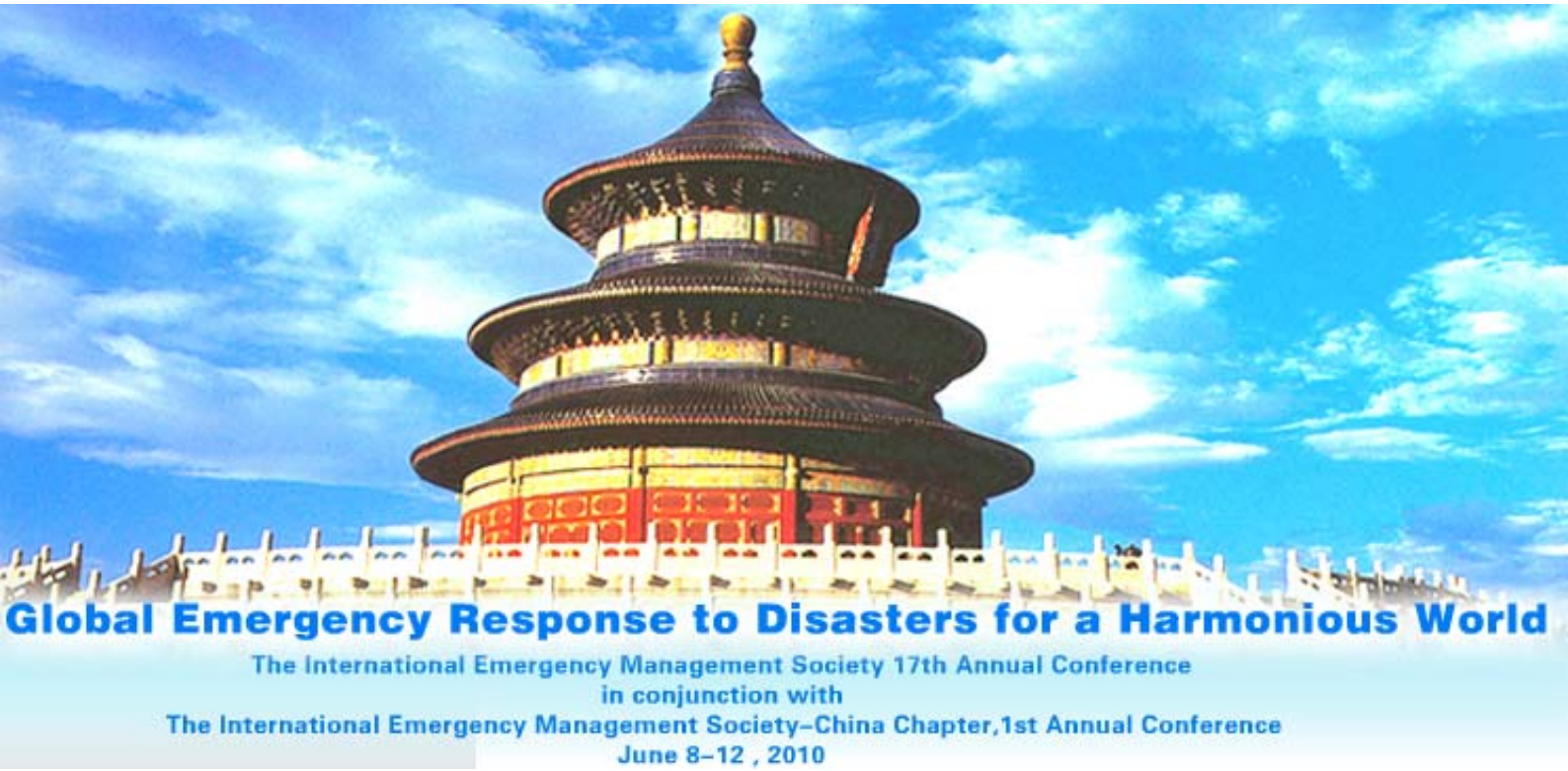
Maria Rubiera Torres, Instituto de Meteorología, Cuba
"Reducing Risk by Adaptation to Tropical Cyclones in Cuba"

We will also be welcoming keynote speakers from leaders from Chinese National Ministries, Beijing Emergency Management Office and Emergency Management Office of Guangdong. And as is tradition the program will end with an introduction to the 2011 conference from representative of the TIEMS Romania Chapter who will host the event.

This year's organisers have a wealth of experience in organisation such events having hosted five successful TIEMS workshops, so this conference promises to be a further accolade to their success.

For those bring partners and family, the program also promises an active social aspect, giving participants and guests the opportunity to relax and take in the Chinese culture. For those who want to explore China further we are also pleased to offer post Conference tours outside Beijing (see website for details).

Local organizers of the Conference are: TIEMS China Chapter, National Earthquake Response Support Service (NERSS), CEA and Beijing Zhong Ji Kexin Research Institute of Economic and Information Technology.



Risk Identification and Land-Use Planning for Mitigation of Landslides And Floods In Croatia

Croatian - Japanese scientific cooperation in disaster management:

By Ognjen Bonacci and Snjezana Knezic, University of Split, Croatia

This was the first time that a Croatian - Japanese project was submitted to the Japanese Government for bilateral scientific research projects within the "Science and Technology Cooperation on Global Issues" programme. Among 142 project proposals from all over the world, this project has been selected as one of ten that the Japanese Government will finance, to provide equipment, expert knowledge and training of Croatian scientists, over a five year period.

The project is being carried out by the Universities of Split, Zagreb and Rijeka and the Croatian Geological Survey, with Japanese partners being the Universities of Niigata and Kyoto and the International Consortium on Landslides. This is being supported and monitored by the Croatian Ministry of Science, Education and Sports and the Japan International Cooperation Agency (JICA).

Dialogue about the projects implementation started in February 2008 when a Japanese delegation visited Republic of Croatia. Project partners joined by The National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia, Ministry of Science, Education and Sports of Republic came together for a workshop to support the collaboration between the Japanese and Croatian researchers, and to establish research fields where joint activities could be developed.

During the workshop, Prof. Ognjen Bonacci and Prof. Nevenka Ozanic gave a lecture on the "Prevention of natural disasters in Croatia", which was well received and within the project, three research groups were established:

- Landslides
- Debris and flash floods
- Mapping

Group photo of project leaders at Workshop in Tokyo

Research will begin in the spring of 2010 at the Kostanjek landslide and at the basin of Great Brook (stream Črnomerec) in the area of Mt. Medvednica in Zagreb city, at the Grohovo landslide in valley of Rječina River north from Rijeka, at Slani potok stream in Vinodol valley, on landslide and torrent stream in the surroundings of Split.


Project managers, Prof. Bonacci, University of Split (right) and Prof. Marui, Niigata University (left) during the Workshop, in a sincere and friendly atmosphere

During the five-year research period, researchers will try to recognise the cause and the probability of landslides' movements, and assess the risk of newly formed landslide areas. A monitoring system will then be defined, together with early warning systems. The hydrological aspect of the research will focus on developing models for propagation of flash floods in urban areas near Zagreb, Rijeka and Split.

In its conclusion the research will bring out various scenarios of interaction between water and environment, with analysis of intensive precipitations and their influence on flash flood hydrograph formation. The risk assessment analysis of debris flow genesis will be carried out, and during the research the local population will be educated about importance these processes, early warning systems and other disasters caused by natural or anthropogenic processes.

In February 2010, working group leaders from Croatia visited Niigata University and spent time investigating landslides zones in Japan. The visit ended with a workshop in Tokyo.

The Asian Disaster Preparedness Center (ADPC)

By Hye Young (Hailey) Kim, Senior Information and Communication Coordinator

The Asian Disaster Preparedness Center (ADPC) is a leading regional non-profit organization supporting the advancement of safer communities and sustainable development. Through implementing programs and projects they seek to reduce the impact of disasters upon countries and communities in Asia and the Pacific, by:

- developing & enhancing sustainable institutional disaster risk management capacities, frameworks and mechanisms, and supporting the development and implementation of government policies;
- facilitating the dissemination and exchange of disaster risk management expertise, experience and information;
- raising awareness and enhancing disaster risk management knowledge and skills; and
- promoting regional cooperation in disaster risk management.

ADPC upcoming events and activities

Pilot Testing for the new Zoonotic Diseases Training Package 'One Health Initiative', 24-27 May 2010, Bangkok, Thailand, (esther@adpc.net)

This workshop will be an opportunity for delegates to contribute to the review and finalization of the Zoonotic Diseases Training Package. Jointly developed by the Murdoch University Faculty of Health Sciences (Australia), University of Chiang Mai School of Veterinary Medicine, and Macro International and coordinated by ADPC, the training package is designed for a broad-spectrum approach, incorporating history and overview of 'One Health', disaster risk preparedness and response to zoonotic diseases, surveillance and monitoring. It seeks to facilitate the sharing of information between the fields of animal and human health, and provide professionals with the skills to manage the threat of zoonotic diseases effectively, from Ministries of Health, Livestock/Agriculture, local governments, NGOs, UN and International Agencies.

2nd Workshop on ASEAN Defence Establishments and Civil Society Organizations (CSOs) Cooperation on Non-Traditional Security (Disaster Management) 28-29 June 2010, Bangkok, Thailand (Bill@adpc.net)

ADPC upcoming training courses

- GIS (Basic) for Disaster Risk Management, 31 May – 11 June 2010, Bangkok, Thailand
- Mainstreaming Disaster Risk Reduction into National Development Processes, 24 - 28 May 2010, Bangkok, Thailand
- Public Health in Complex Emergencies, 12 – 24 July 2010, Bangkok, Thailand
- Community Based Disaster Risk Reduction, 19 – 30 July 2010, Bangkok, Thailand
- Incident Command System for Disaster Management, 9 – 15 August 2010
- Hospital Emergency Preparedness and Response, 20 – 24 September 2010, Bangkok, Thailand
- Flood Disaster Risk Management, 10 – 22 October 2010 Bangkok, Thailand

For more information about ADPC training course, please contact: tedadpc@adpc.net

ADPC upcoming publication

Asian Disaster Management News
Published three times a year, with one thematic area per issue, this periodical serves as a channel of communication for disaster risk management practitioners and development workers in the region. The coming issues (May-August) will focus on Earthquake Risk Management

For the past issues, please check at http://www.adpc.net or contact hykim@adpc.net

For more information on ADPC, please visit ADPC website http://www.adpc.net or use the following contacts:
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TIEMS India Chapter Founded

During his stay at TIEMS 2009 Conference in Istanbul Venu Madhav Maroju expressed an interest to initiate TIEMS India Chapter. At the beginning of 2010 TIEMS International received an application that was approved in March 2010. The TIEMS India Chapter is managed by:

- Madhav Venu Maroju, President of the TIEMS India Chapter,
- Teegalapally Prasad, Secretary of the TIEMS India Chapter,
- Latha Muppavarapu, Treasurer of the TIEMS India Chapter.

After creation, the Chapter will campaign for individual and institutional membership, and intend to connect their members with existing TIEMS members and other chapters in the exchange of views and experience, and to support this plan to organise an annual workshop in Hyderabad / Mumbai.

The chapter's strategy is to create awareness and disseminate, knowledge and best practices regarding the entire life cycle of emergency management, and to achieve this intend to cooperate with TIEMS International to support the TIEMS Accreditation and Certification program.

They will actively seek to link industry, academia and TIEMS in cooperation to promote activities that meet the objectives of both the India Chapter and TIEMS International. They also intend to build a network with government agencies and partners to help influence national activities such as: policy writing, planning strategies and providing tactical support in training and operations through groups of experts and other interested parties.

Earthquakes, Tidal Waves & Volcanic Eruptions
An update from Chile

By Rolando Stein, TIEMS Director of TIEMS for Latin America and Caribbean

According to Chilean chronicles, starting with the arrival of the Spanish "conquistadores" back in the XVI century - 112 major earthquakes (EQ) measuring above 7.0 on the Richter scale have struck Chile to date, the first recorded in 1552.

Photo courtesy of James Guppy

Thirty-two of these events have generated devastating tidal waves. One which notably made history being in the southern city of Concepción on February 20, 1835, when an earthquake (measuring 8.3 on the Richter scale) and creating a tidal wave, was personally experienced by Charles Darwin, then on a scientific mission around South America on board the "HMS Beagle". Only weeks before this event he had described the magnificent mountain ranges surrounding the Chilean scenery and meditated on the enormous forces of nature, and the eons required to raise "these colossal masses".

Nature was ready to give Darwin a helping hand in his observations: on January 19, when he witnessed the eruption of the Osorno volcano. The young scientist must have thought that Chile was the most adequate place in the world to confirm the validity of his theories.

Chile has an inventory of 2000 volcanoes, 500 of which have erupted during their lives, and 60 having recorded activity within the last 450 years (approximately 300 eruptions). The latest was the Chaiten volcano, in May 2008 that forced 4500 inhabitants of the town to be evacuated.

Earthquakes and tidal waves have also caused us devastation including one recorded on May 22, 1960, that struck Valdivia which reached 9.5 on the Richter scale, as is considered up to now the world record, and resulted in displacement of some 20 meters.

More recently (February 27) came the devastating earthquake measuring 8.8 on the Richter scale, and which resulted in a tidal wave and some 300 aftershocks, felt across 700 kilometres from north to south. The key region affected is where the most populated cities of Chile are situated, including the nation's capital Santiago, with its 5 million inhabitants. Again, the area most severely hit was Concepción, which "moved" some 10 meters, while other places "climbed" over 3 meters. Apart from these big cities, hundreds of modest towns and villages by the sea coast - including the famous "Robinson Crusoe" island - were overrun by tidal waves.

Photo courtesy of U.S. Geological Survey

The damages have been estimated at US$30 billion, equivalent to10% of Chile's GDP, the most devastating calamity that has ever hit our nation. Many countries and institutions, public and private, sent immediate help – like search and rescue teams, prefabricated houses, emergency hospitals, schools, medicines, besides experts – in assistance of the victims. Chileans shall forever remember their dedication and generosity.

As Peter Yanev, of the New York Times wrote, "this was the most important mega earthquake in the last hundred years that has hit a developed country with strict building codes."

What seems a miracle is that this catastrophe claimed less than 500 lives, despite the fact it was 700 times more violent that the one that struck Haiti, where nearly 300.000 people died.

Photo courtesy of hdur

Surely, this was due to the fact that the construction laws in Chile, starting with the Chillán earthquake back in 1939 - which took 6000 lives of a total 20 thousand inhabitants - became quite demanding. After the recent experience, it is already being discussed that "shock resistant foundations" technology will be required for certain buildings. Those few which already had these foundations saw their vibrations reduced by seven fold, by comparison to those buildings without them.

I was in Santiago early that morning and would like to share this experience with you.

My wife and I live on the 19th floor, and at 3.37 am were sleeping peacefully. Suddenly we were awakened by the barking of our dog, some 15 seconds before the shaking started. At first we stayed in bed– perhaps it will be a minor earthquake, I thought – but as it intensified I got up and tried to get my video camera to film this event, just as I had done with the one of March 3, 1985.

This time, however, the intensity of the earthquake did not allow me to do so. I was hardly able to get up and reach the adjacent balcony – holding tight to window frames - and from there contemplate, feel and hear the unleashed fury of nature. It was now pitch dark, except for few lights from the emergency generators, added to the blue explosions of breaking electricity cables in the horizon. Most impressive of all was the immense hoarse roar that seemed to come deep down from the center of the earth, as if being released by some sort of a planetary boiler. On a higher sound tone, I could also hear pictures, glasses, lamps, dishes, bottles, pot and pans, all crashing to the floor, mixed with the groans of our shaking building.

At this stage, perhaps one minute or so from the start of the quake, I had no doubt that this was really going to be a major one. As the movements increased, I thought that our building would fall apart, that this was the end. My wife – unable to get up because of the force of the quake – had quietly accepted the fact that we would collapse, but this she would do with dignity… in bed. The entire incident only lasted about two minutes and, fortunately, we survived it unscathed.

By our bedside we always keep a flashlight, so we made a short tour after the quake had stopped to evaluate the damage. Some dividing walls had cracked, heavy furniture was displaced to the middle of a room, the kitchen was a mess, broken glass everywhere, but nothing structural appeared damaged. Outside, sirens started to wail

and vehicles moved, perhaps going in search of family and friends. The blackout continued for some hours; during which time there was also no running water, communications systems and the only link with the outside world was our portable radio. A couple of hours later, exhausted, we both went back to sleep.

Early next morning, with no elevators available for precautionary measures, I went down the stairs to learn if the building – 18 years old - had had suffered structural damage: and fortunately there was none, although according to the architects it swung during the quake, some 20 centimetres from side to side. The tall neighbouring buildings had no serious damage either.

On a quick stroll around the block, it impressed me to see a number of pigeons just sitting in the grass, ignoring me as I passed by, as if afraid to fly. If the psychological effects of the quake had taken its toll with birds and dogs – my dog was shaking and not at all happy - it seems that it was a lot worse for humans: the following days the Health Department reported that the sale of antidepressants and sleeping pills had increased by 40%. People felt more emotional and needed to discuss, even with strangers, their experience. For weeks we had the impression that the earth was moving under our feet, just like the sensation one has back on firm land after being at sea, and expecting another quake. The number of visits to psychologists has not been disclosed.

Photo courtesy of Anexo14

But even if my neighbourhood was not severely damaged, in other areas of Santiago some 45,000 homes were severely hit and 15,000 will have to be demolished. Estimates are that 2,500,000 Chileans have lost their homes and many industries, schools, hospitals, churches have been completely destroyed.

With this rich “history of natural disasters” it should not be surprising that earthquakes, tidal waves and volcano eruptions qualify Chile as a special and privileged laboratory for scientists the world over, who come here to study and to understand, not only our exciting geography and challenging environment but, also, the mysteries and intricacies of our planet.

This was well understood by the TIEMS authorities and explains why we had organized, well in advance of the quake, a Workshop in the Diplomatic Academy of Chile on “Prevention, Mitigation and Recovery from Natural and Technological Disasters”. It obviously, had to be postponed among many other reasons because the venue, our old Diplomatic Academy building, also suffered severe damages.

We are already working to reorganize the workshop in November 2010, and will no doubt include some of the issues that arose from the recent quake, both its positive and negative aspects and the many hard lessons we have learnt.

A final note: Chileans were greatly affected by this catastrophe not only because of loss of family and friends, but also in emotional, psychological and material aspects. Yet, as has happened throughout our history, we are certain we shall once again recover and will be able to rebuild a better and safer country together with a brighter future.

With this positive attitude in mind, we shall be prepared to welcome you all at our renewed TIEMS workshop before the end of the year.

Asia-Oceania Resilience 2010
2-day Conference

5th - 6th October 2010
Singapore

Venue PARKROYAL on Kitchener Road

Fees SGD **495** (IAEM Members) for 2 days

SGD **645** (Non IAEM Members) for 2 days

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Risk area estimation and consequence based analysis using 3D terrain modelling

Case study: an accidental phosgene release scenario near Râmnicu-Vâlcea, Romania

By Nicolae Ajtai, Zoltán Török, Alexandru Ozunu, Babeş-Bolyai

Introduction

Phosgene (Cl2CO) gained its notoriety in World War I as a chemical weapon, and is currently used as a chemical reagent and is a basic component in organic synthesis.

Industrially, phosgene is produced by passing chlorine gas and purified carbon monoxide through a bed of porous activated carbon, which serves as a catalyst.

Corrosive to exposed tissues; inhalation of phosgene vapors can result in a pulmonary edema and chemical pneumonia. Non-flammable, but on contact with moisture reacts violently and decomposes to toxic compounds, including chlorine.

Due to its high toxicity, storage is strictly controlled, usually in confined areas with ventilation using a neutralization system. In spite of these safety measures however accidents do occur, for example when a phosgene pipe ruptured on September 8, 1994, in Yeochon, Korea, resulted in multiple injuries and 3 deaths. (CRRNE, Lung-Damaging Agents, Phosgene, 2009)

Implementing Seveso III in Romania

Romania, as a recent member of the European Union has specific goals to achieve in order to meet EU standards. One major goal is represented by the environmental and industrial sector's ability to achieve specific standards.

A major guideline is represented by the Seveso Directive, which is applicable to any establishment where dangerous substances are present or likely to be produced as a result of an accident. The list of named substances covered by the directive was reduced from 180 to 50, but is accompanied by a list of categories of substances, which in practice broadens the scope.

Directive 2003/105/EC (Seveso III) extended the scope and applicability of the Seveso II Directive to cover the processing and storage of minerals containing dangerous substances. For establishments which subsequently fall within the scope of Directive 96/82/EC, it has been shown necessary in Seveso III to introduce minimum periods for notifications and the establishment of major accident prevention policies, safety reports and emergency plans. (SCAD Plus, Major Accidents involving Dangerous Substances, 2009)

This approach also facilitates the public's access to information, and gives the public a more important role in the decision-making process. The operator and the authorities must actively raise awareness regarding potential hazards concerning the site and surroundings through campaigns and similar dissemination methods. Romania has a total of 281 Seveso facilities. (Ozunu and Anghel, 2007)

Therefore reliable data must be obtained in order to evaluate the risk factor with high accuracy. The method presented is through a simulation of a phosgene release and dispersion.

Our site meets the qualifying phosgene quantities required of the Seveso Directive, therefore is considered to be a Seveso objective.

Consequence based risk analysis

Generally, risk assessment methods begin with the identification of hazards and

vulnerabilities, frequency and consequence analysis of each of these vulnerabilities and hazards. Consequence based risk analysis as an approach starts with the identification of the major consequences by analyzing the potential accident scenarios and the effects of the accidents upon the environment, human factor and structures. The process then searches for combinations of hazard and vulnerability that could result in the most serious consequences (TNO, Purple Book, 1999).

The advantage of the consequence based risk analysis is that it will show how the qualitative threat, vulnerability and consequence information can be combined to derive a qualitative value for risk and offer an easy-to-understand graphical way to present risk assessment results. (American Institute of Chemical Engineers, 1989)

Simulation

The model used in the simulation of the chemical accident with phosgene release and dispersion is the SEVEX (SEVeso EXpert) complex 3D terrain dispersion model.

In SEVEX are included three modules:

1. The SEVEX-Meso is a complex 3D terrain and meteorological model which solves the Navier-Stokes equations, considering the terrain roughness (the topography of the terrain), the land use of the terrain (five categories: water, forest, urban, grass-land and the mixture of the previous four) and the solar radiation and heat transfer between the ground and the atmosphere.

2. The SEVEX-Toxic module is a Lagrangian 3D dispersion model that simulates the passive transport and dispersion of toxic and flammable material.

3. The SEVEX-Source module simulates different types of releases, effects and consequences of accidents. (ATM PRO, 2009)

These three modules combined in SEVEX View software compute the worst-case realistic conditions of an accident. SEVEX View is the only software that considers both the SEVESO directives of the European Commission, and U.S. EPA guidelines, and was built to simulate major industrial accidents, so the model is designed for impact zones from 1 to 18 km (Ozunu et al, 2007).

Case study

The site located at a height of 150 m above sea level, and 10 km from the city of Ramnicu-Valcea on the banks of the Olt River and a terrace 7 meters above Govora Lake. The facility itself is 2km long and 1.5km wide, covering 2.143.852,3 m2, with buildings covering 645.573,8 m2.

The site is surrounded by hills with a maximum altitude of 450 m, (mean absolute altitude = 150 m).

With the building of the dams on the Olt valley, the surface covered by water increased, resulting in an increase of the relative humidity in the site's area, with a mean of 76%. The total annual precipitation in the area is 710,5 mm.

The wind circulation, both direction and speed, are influenced by the area's landscape. The Olt Valley has an obvious funneling effect, the highest wind frequencies occurring from the north (10.2%) and south (13%). The atmospheric calm situation has the highest occurrence rate (37.4%). The mean wind speed varies between 0.8 and 2 m/s. On the predominant wind direction we find Lake Govora and Stolniceni and Stupărei villages. The dominant atmospheric stability conditions are class D (neutral), E (slightly stable) and F (stable).

Technical specifications

The storage vessel has the following technical characteristics: length, L = 6 m, diameter d = 2.6 m, maximum capacity of storage equal to 37.64 tons of phosgene at 20oC storage temperature, 85% filling level and at 3 bar service pressure. The storage tank is located underground, in an enclosed concrete room with ventilation leading to neutralization system.

We have two possible release scenarios:

1. The first release scenario takes into consideration catastrophic rupture of the storage vessel, followed by the release of the entire quantity of liquefied phosgene

2. The second scenario consists in a 10 minute continuous release of phosgene with a transient release of 0.9 tons of phosgene from a ruptured pipe

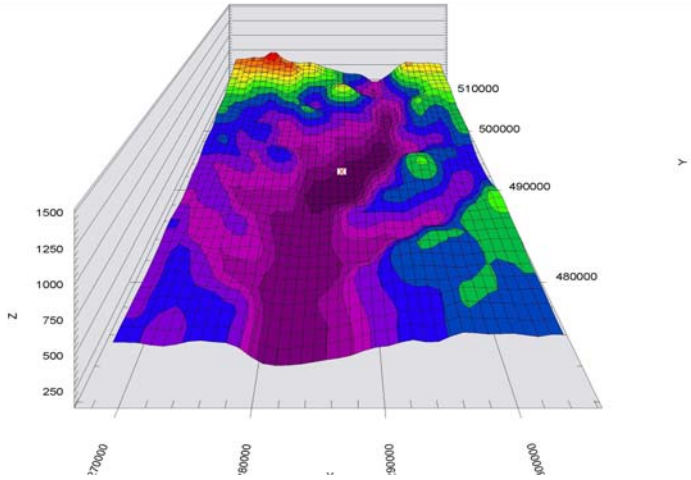


Fig. 1
37x37 km 3D representation of the area

Results and discussions

We performed the simulation of the accident, considering the meteorological "worst case scenario" for the two types of release, for daytime, with a complete cloud cover, a 70% relative humidity, stability class D, a ground temperature of 19oC was calculated, air temperature of 20oC, and for nighttime with no cloud cover, a 90% relative humidity, stability class F, a calculated ground temperature of 10.13oC, air temperature of 10oC.

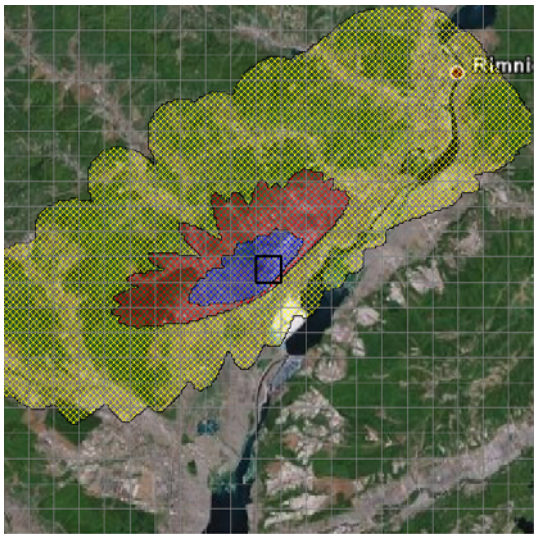
In all simulation cases a map with 37 km x 37 km area was used. The simulation considers the complex topography and the land use of the terrain, calculating the wind direction and velocity for every 1 km x 1 km square.

The wind speeds for 36 directions were computed, in every 10o, from 0o to 350o. For this reason, the overall area of danger is estimated based on a discrete set of result, so called plume fingers.

Three different concentration levels were selected, 17 ppm for LC50 (lethal concentration 50 % kill) dangerous concentration indoor (evacuation of population is necessary), 5 ppm for IDLH (immediately dangerous for life and health) and 0.2 ppm causing temporary affections (avoiding exposure is advised), representing the dangerous concentrations for 30 minutes exposure.

The graphical representations show the concentration levels indicated above, which could occur during 60 minutes in low wind condition and 2 m/s synoptic wind conditions.

The meteorological simulation results regarding the wind directions are confirmed by the local measured data (see Fig 2-9).



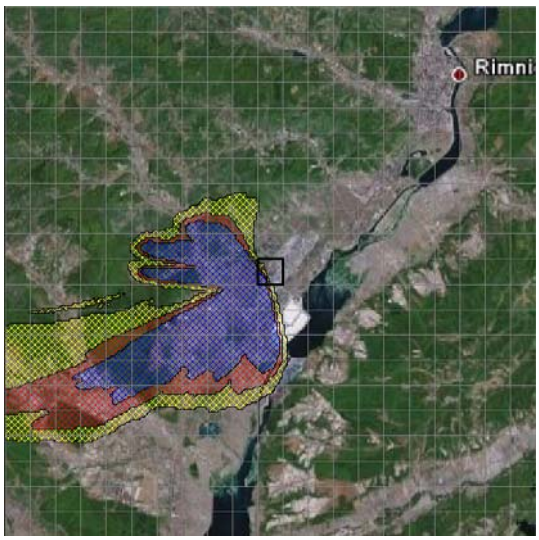


Fig. 3

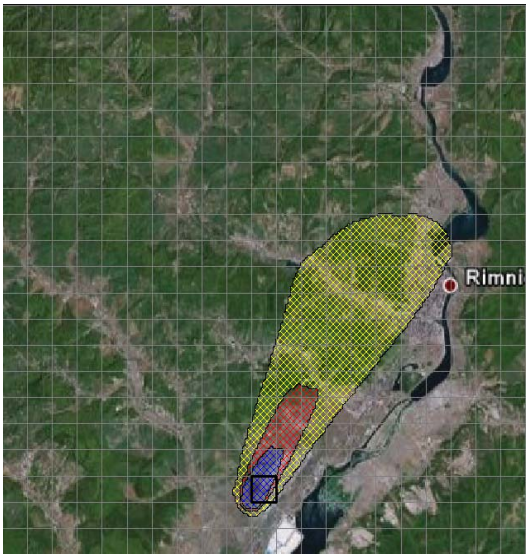


Fig. 4

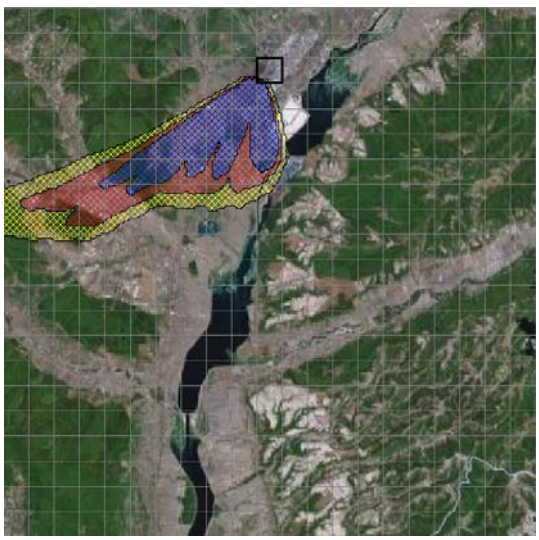


Fig. 5

Fig. 2 - Low wind daytime dispersion
Fig. 3 - Low wind night-time dispersion
Fig. 4 - 2 m/s synoptic wind from S, daytime

Fig. 5 - 2 m/s synoptic wind from N, night-time

Risk	Orders	Criteria
None	No change in behaviour	C < 0.2 ppm
Temporary diseases Superficial injuries	Avoiding exposure advised	0.2 < C < 5.0 ppm
Permanent injuries out door	Self-confinement exclusion	5.0 < C < 17.0 ppm
Danger indoor	Evacuation	17.0 < C ppm

Catastrophic release of phosgene

10 min transient release of phosgene

Fig. 6

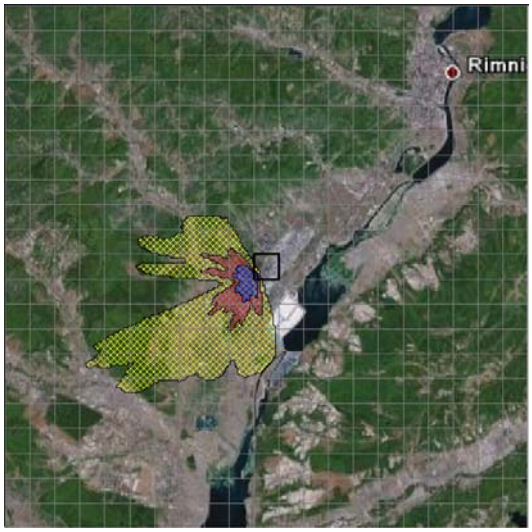


Fig. 7

Fig. 8

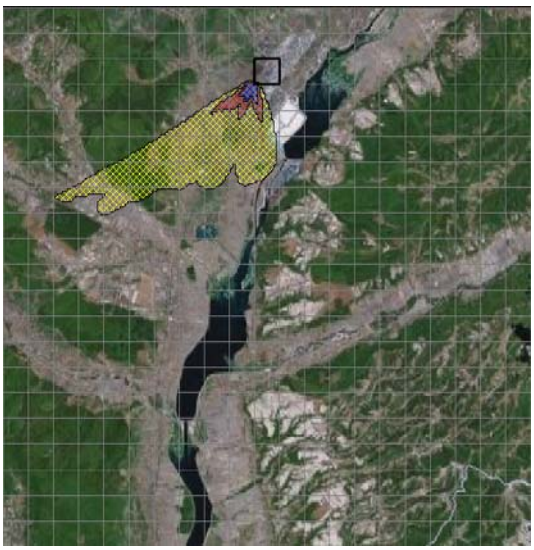


Fig. 9

Fig. 6 - Low wind daytime dispersion
Fig. 7 - Low wind night-time dispersion
Fig. 8 - 2 m/s synoptic wind from S, daytime
Fig. 9- 2 m/s synoptic wind from N, night-time

Risk	Orders	Criteria
None	No change in behaviour	C < 0.2 ppm
Temporary diseases Superficial injuries	Avoiding exposure advised	0.2 < C < 5.0 ppm
Permanent injuries out door	Self-confinement exclusion	5.0 < C < 17.0 ppm
Danger indoor	Evacuation	17.0 < C ppm

The daytime simulation for catastrophic release (Fig. 2) shows that the villages of Negreni and Buleta will be the most affected, being covered by the high concentration cloud with concentrations exceeding 17 ppm(LC50). The second danger zone corresponds to concentration levels between 5ppm (IDLH) and 17ppm (LC50), covering Govora, Barsesti, Vulpesti, Scarisoara villages with a total population of 6297 inhabitants and also reaches Ocnele Mari city with a population of 3.578 inhabitants. The third concentration zone with concentrations under 5ppm covers a large area reaching Ramnicu-Valcea with a population of 120.363 inhabitants. (Casa de Asigurari de Sanatate Valcea, Populatie, 2009)

In the night-time simulation for catastrophic release (Fig.3) the high concentration cloud covers a much larger area and develops to the west and south-west affecting Negreni, Buleta, Mihaesti, Arsanca, Magura, Rugetu, Viisoara, Cosani with a total population exceeding 10 000 inhabitants. The danger zone corresponding to the second concentration level covers Capu Dealului, Tatarani, Munteni, Manailesti, Firijaba. The zone with concentrations under 5 ppm is considerably smaller than in daytime conditions. Due to the fact that the high concentration area covers a much larger area, the nighttime scenario is considerably more dangerous. (Casa de Asigurari de Sanatate Valcea, Populatie, 2009)

Considering the 10 min transient release scenario, the only potentially dangerous situation for the surrounding population might occur during low wind conditions at night-time(Fig. 7). The other three scenarios (Fig. 6, Fig. 8, Fig. 9), only poses danger to the workers inside the facility's boundaries.

Regarding the fact that the most common meteorological conditions present in the area, involve a 2m/s wind from the north at night-time and from south at daytime, simulations representing these situations were also taken into consideration. The most dangerous situation is catastrophic release under these conditions (Fig. 5).

Conclusions

The Sevex concept is to represent the danger zones where these concentrations might occur during the dispersion period,

therefore the exposure time is not so relevant, the focus should be on the dangerous concentration levels that might occur in a “worst case scenario” situation.

The simulations show that the situation could become extremely dangerous to the nearby inhabitants, therefore an efficient external emergency plan must be developed and according o the Seveso III Directive, the population should be informed about the hazards involved, emergency individual and collective measures, warning and evacuation plans.

In order to achieve this, high quality data is required, following the principle: “good quality data leads to good decisions”. With the use of high performance software like SEVEX, we can aid the Romanian stakeholders and decision makers with information they need in order to develop efficient plans and policies.

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June 2010

Understanding Risk
1st – 6th June, 2010
Washington, DC
What is risk? Can we measure it? If we understand it, can we manage it better? These are the fundamental questions the Understanding Risk community seeks to address and discuss in an online community forum.

http://community.understandrisk.org

TIEMS 2010 – 17th Annual Conference
8th – 12th June 2010
Beijing, China

TIEMS 17th Annual Conference will devote itself to continual improvement of our ability, both nationally and internationally to avoid, mitigate, respond to, and recover from emergencies and disasters.

www.tiems.org

October 2010

IAEM's Asia-Oceania Resilience
5th – 6th October 2010
Singapore, China

Bringing together, for the first time in Asia, security, emergency management, crisis management, business continuity management, risk management, professionals from 29 countries to learn about products and services that support corporate and community resilience.

http://www.iaem.com.sg/Asia-Oceania-Resilience-2010.htm

IAEM 58th Annual Conference & EMEX 2010
30th October – 4th November 2010
San Antonio, USA

The IAEM Annual Conference provides a forum for current trends and topics, information about latest tools and technology in emergency management and homeland security, and advances IAEM committee work.

http://iaem.com/events/Annual/intro.htm

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