Activities Report

On the Collaboration Agreement between the International Strategy for Disaster Reduction of the United Nations and the Directorate General Joint Research Center of the European Commission

5 – 6 November, 2003

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ABOUT THE

COLLABORATION AGREEMENT

Entry into force:
21 February 2003

End:
31 December 2006

Partners:
European Commission DG Joint Research Centre,
Institute for the Protection and Security of the Citizen (DG JRC)
and
United Nations International Strategy for Disaster Reduction (ISDR)

Aim: to set out a framework for collaboration to carry out research in the field of ***vulnerability reduction*** and ***risk management***.
Vulnerability reduction and risk management for the reduction of the impact of natural and other related disasters is the subject of mutual interest in which ISDR and DG JRC have complementary competencies.

Areas of collaboration:

- relationship between natural and technological hazards (natechs)
- socio-economic consequences of disasters.

Activities

With the purpose of promoting research in the field of disaster reduction, vulnerability and risk management a number of activities have been realized under the Collaboration Agreement.

1. NEDIES Workshop: In Search of a Common Methodology on Damage Estimation

The NEDIES Workshop "In Search of a Common Methodology on Damage Estimation was carried out in Delft, The Netherlands on 23 - 24 May 2003. The workshop was co-organized by DG JRC within the framework of the NEDIES project (http://nedies.jrc.it), and the University of Twente, The Netherlands. The UN/ISDR was represented at this workshop by the Asian Disaster Reduction Center, who is member Working Group 3 on Risk, Vulnerability and Impact Assessment of the Inter-Agency Task Force on Disaster Reduction. A presentation was given, entitled "How to estimate the Economic Loss? - Example from a Tokai Earthquake."

2. Participation in the Euro-Mediterranean Forum on Disaster Reduction

The UN/ISDR invited Alfredo C. Lucia, Head of Unit of the Technological and Economic Risk Management Unit of the Institute for the Protection and Security of the Citizen, Directorate General of the Joint Research Centre of the European Commission, to participate in the Euro-Mediterranean Forum on Disaster Reduction, which was held in Madrid (S) on 6-8 October 2003, and was co-organised by the Council of Europe, the UN/ISDR Secretariat, and the Spanish Ministry of Interior. As a result, the Declaration of Madrid proposes the organization of a conference under the auspices of the United Nations (ISDR, UN-HABITAT,OCHA, UN/ECE), the European Commission and the Council of Europe EUR-OPA Major Hazards Agreement on the topic of land use policy and risk prevention focusing on floods, forest fires and industrial risks, to be held in the first half of 2004 and before the Second World Conference on Disaster Reduction (January 2005). In addition, the NEDIES activities of the JRC were also presented by Javier Hervas De Diego during the technical session of the Forum, on "Initiatives for Improving Cooperation in the Euro Mediterranean Area." Hervas De Diego also chaired the "Social Vulnerability and Impact of Disasters" session of the Technical Meeting on the "Legal, Economical and Social Aspects of Disasters" as a follow-up of the NEDIES workshop on Socio-Economic Assessment of Disasters, Delft, 23-24 May, 2003.

3. NATECHS

Rationale behind collaboration on Natech Disasters

A natech disaster is caused by a natural hazard triggering a technological disaster. In Europe, there are many vulnerable installations close to a river or in earthquake prone regions and are thus, potentially prone to flooding or strong ground shaking. The recent floods across Europe in the summer of 2002 were an example which showed the potential danger of a natech disaster occurring near populated areas. This was the case in the Czech Republic and in Germany where rapid response from the Civil Protection Authorities prevented disaster from striking.

Because of the threat to society and the environment of this domino effect, the NEDIES project has launched a research activity in this area to assess the state-of-the-art of natech management in the EU and Candidate Countries, as well as to identify needs and assist actors and stakeholders in identifying and prioritizing strategies for natech risk reduction.

a. Secondment of Scientific Expert in Natechs to the EC/JRC

A scientific expert in Natechs, Ana Maria Cruz, Ph.D, was seconded by the UN/ISDR to the EC/JRC to carry out work envisaged in the Collaboration Agreement between the European Commission and the International Strategy for Disaster Reduction of the United Nations No. 20466 – 2003 – 02 S0SC ISP CH.

Ana Maria Cruz participated in the development of a workshop on Natechs held in Ispra (described below), and is collaborating in the preparation of a report on the state-of-the-art in natech disaster management in Europe, based on experiences from Europe, Japan and the United States.

b. NEDIES Workshop on: Analysis of Natech Disasters (Natural Hazard Triggered Technological Disasters).

The NEDIES workshop on "Analysis of Natech Disasters (Natural Hazard Triggered Technological Disasters)", co-organized by the UN/ISDR was carried out at the Joint Research Centre of the European Commission in Ispra, Italy, on 20-21 October, 2003. The workshop was attended by 13 representatives from Member States, Accession and Candidate Countries, plus USA and Japan. The objectives of the workshop included:

- to create awareness of the potential for joint natural and technological disasters (natechs);
- to assess the state of the art in natech risk reduction; and
- to identify and propose a set of key strategies for future natech risk reduction

The workshop included plenary sessions and parallel working sessions during both days. There was an opening session by the JRC and the UN/ISDR, followed by keynotes from invited speakers from several countries. The keynotes included a report on emergency response during the recent blackout in Italy; a presentation by the seconded expert on natechs following the Turkey earthquake of August 1999; the impact of the recent earthquake in Hokkaido, Japan, in September 2003 on an oil refinery; the state of the art in natech management in the United States; and experiences from the Netherlands on floods management. The workshop also included presentations by representatives from participating countries on natech risk management in their countries. These presentations were followed by a day and a half of parallel working sessions, where the country representatives worked together as a group to address a series of questions concerning natech disaster impacts, vulnerability, and risk reduction. The results of the workshop were a set of recommended key strategies to natech risk reduction.

Workshop on Natechs
Agreed Key Strategies for Future Natech Risk Reduction

- ***Emergency planning***, including prevention and mitigation, and response planning specifically for natechs at all levels of government.

- ***Education*** of the public, government agencies involved in emergency management, as well as decision-makers on the potential of natech disaster impacts, and natech risk reduction. For example, development of written material on natechs prevention and preparedness measures, training of emergency responders in specialized areas (e.g. hazmat fire fighting, hazardous materials response training), training of medical personnel at hospitals for treatment of patients exposed to toxic chemicals, etc.

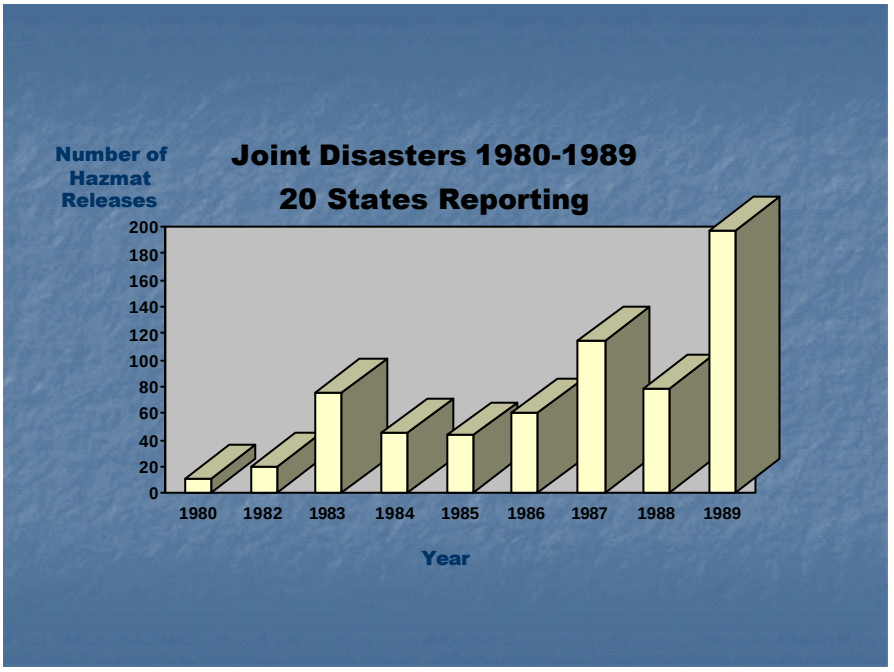
- ***Public participation*** in natech risk reduction planning. Many country representatives felt that natech risk management should incorporate much public participation in order to better understand a) the local population's perception of the level of the natech risk and b) the level of natech risk they are willing to accept, and public commitment to natech risk reduction policies.

- ***Industry risk management,*** which specifically address the potential impacts of natural hazards on their installations. For example, modifying the SEVESO Directive (82/501/EEC) and ADR Framework Directive (94/55/EC) to include natural-hazard triggers was proposed as one of the main strategies that could be adopted to achieve this. Additional risk management actions which can be promoted to make plants less vulnerable to natechs were also discussed including: the use of redundant safety systems, natural hazard-resistant designs, the provision of guidelines to inform industry about natech planning, and requiring the strategic placement of hazardous substances inside a plant.

- ***Land use planning***, as an important technique for separating residents and hazardous facilities; and *risk mapping*, possibly tied to a centralized information center, to facilitate natech risk reduction.

BACKGROUND ON NATECHS

JOINT NATURAL AND TECHNOLOGICAL DISASTERS (NATECHS) IN THE USA



Natech events in petrochemical plants:

Marsh & McLennan (1997) review the 100 most costly incidents of property damage losses in the hydrocarbon-chemical industry in the world over a 30 year period.

- 8% of incidents are natech events
- 13% of all losses occurred during startup and shutdown
- Vapor cloud explosions caused the most damage

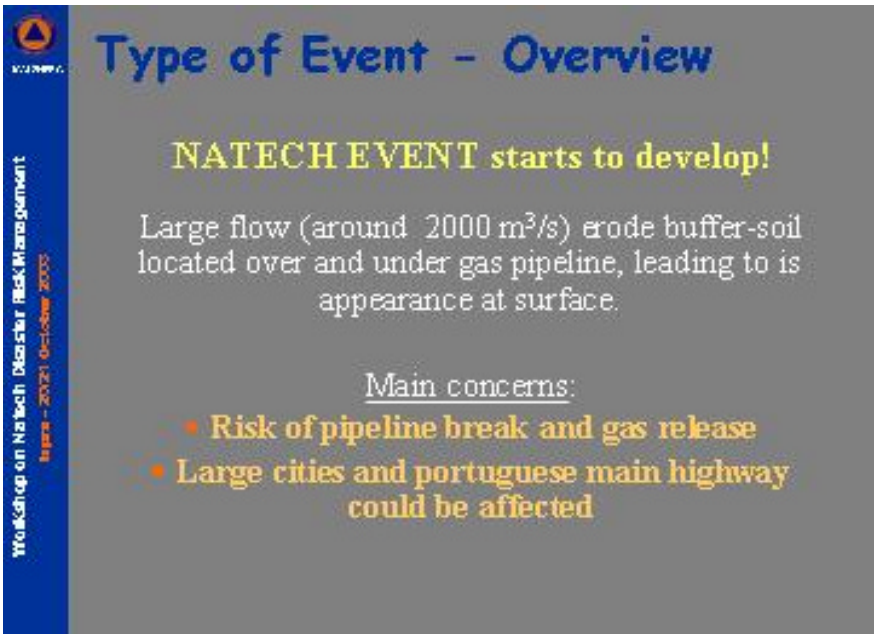
GAPS IN NATECH RISK REDUCTION IN THE US

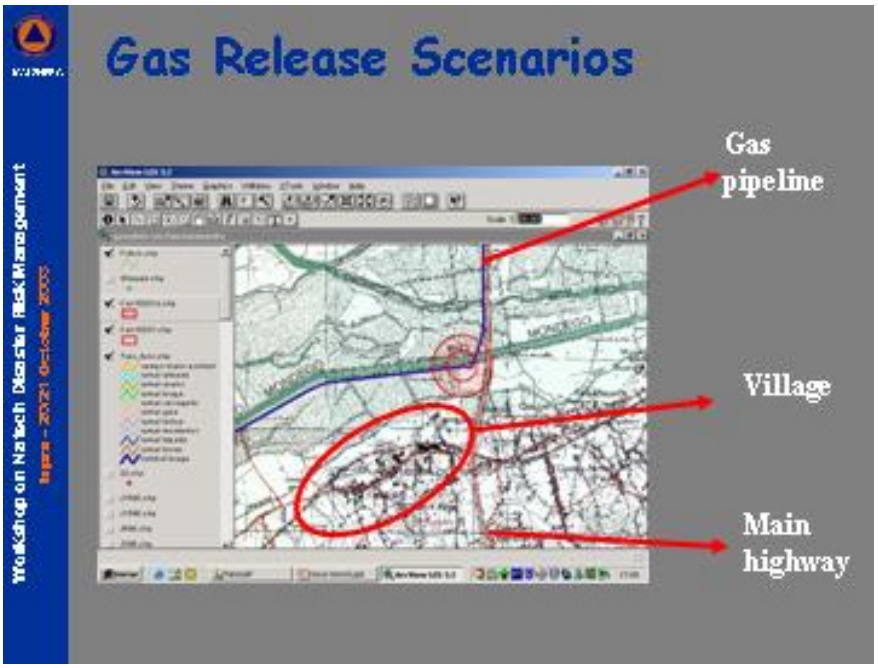
- Data is lacking (need centralized reporting, data is closely held by industry, little sharing between countries)
- Probabilities of natechs occurring have not been calculated - would complement similar data for other hazards.
- Vulnerability assessments left to industry to perform – difficult to verify information.
- Industry vulnerability assessments do not include natural hazard triggers -> preparedness, mitigation, and response plans do not consider natech needs.
- Older facilities do not meet current design standards.
- Community mitigation and response plans do not incorporate simultaneous disasters.
- Design standards can be exceeded. Are they strict enough?

Potential Effects of these Gaps

- Large earthquake, powerful hurricane, properly sited tornado, etc. could trigger catastrophic release.
- Emergency response teams will not have an appropriate response plan to activate.
- Emergency response capabilities will quickly be overwhelmed should simultaneous releases occur.
- The public will not know how to prepare or respond to the joint event.
- Mitigation measures designed for "normal" operating conditions will fail.
- Cascading disasters may occur.

LESSONS FROM PORTUGAL





MAI-SNBPC

Workshop on Natech Disaster Risk Management

Ispra – 20/21 October 2003

Lessons Learnt

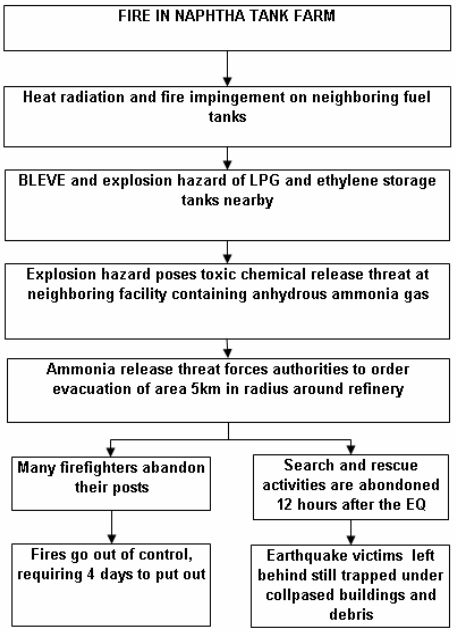
- Focus on the role of the Emergency Management Authority as the main coordination organization for Civil Protection Operations
- Focus on the role of Civil Protection as an interface between scientific knowledge and operational issues
- Focus on the need of risk scenarios and updated geographical information
- Focus on the need to update emergency plans
- Improve articulation with organizations specialized in providing meteorological data (winds) and gas dispersion models
- Improve articulation between Civil Protection authorities at local, district and national level
- Importance of emergency solutions: dykes recovery and pipeline stabilization (implantation of concrete footing to prevent floating)

LESSONS FROM TURKEY

The magnitude 7.0 earthquake in Turkey on August 17, 1999, triggered unprecedented multiple and simultaneous hazardous materials releases, causing havoc on emergency response operations to earthquake victims. Examples of the hazardous materials releases include:

- The leakage of 6.5 million Kg of toxic acrylonitrile (ACN) contaminating air, soil and water, and threatening residential areas
- The intentional air release of 200,000 Kg of ammonia gas to avoid over pressurization and explosion.
- The release of 1.2 million Kg of cryogenic liquid oxygen caused by structural failure.
- Three large fires in the crude unit, naphtha tank farm and chemical warehouse at Turkey's larges oil refinery consuming more than 180,000 m^3 of fuel.
- Liquefied petroleum gas release causing a fire that kills to truck drivers

CONSEQUENCES OF THE FIRES FOLLOWING THE TURKEY EARTHQUAKE ON THE COMMUNITY

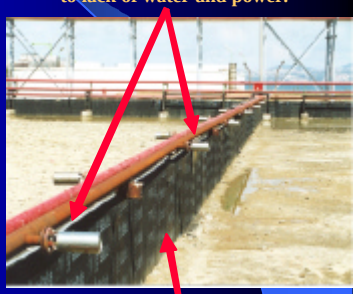


Problems identified:

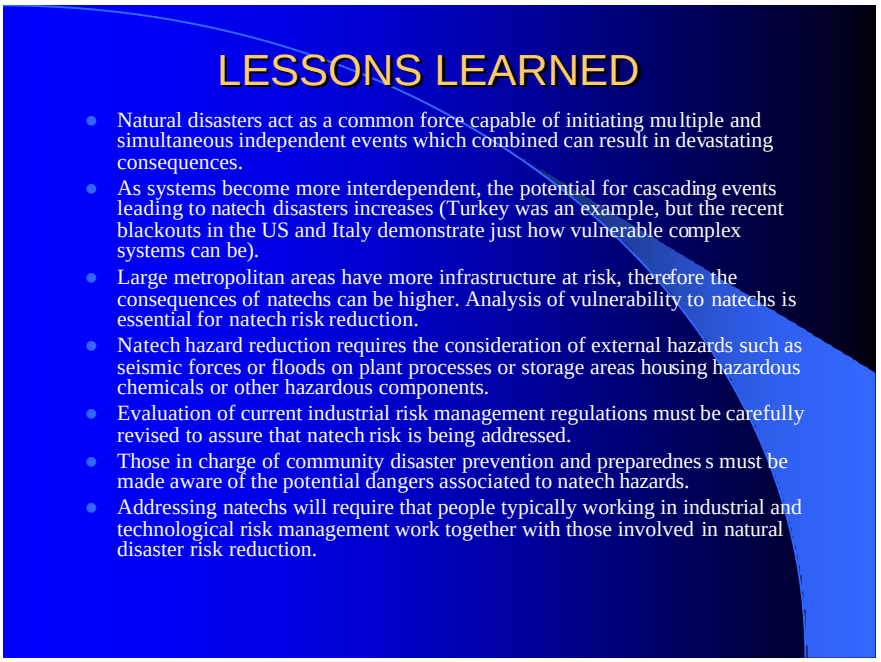
Problems identified:

- Seismic design considerations were generally not applied to safety and mitigation measures.
- Safety and mitigation measures was based on the availability of lifelines.
- Emergency response (ER) plans for hazmat releases considered one hazmat incident at a time.
- The proximity of the industrial facilities to urban areas affected not only nearby residential areas, but also neighboring communities.
- The natech disasters posed additional health and psychological problems to an already devastated population.
- Local emergency management officials were unprepared to respond to multiple hazmat releases.

Automatic foam sprayers available at AKSA at time of earthquake, but useless in containing ACN release due to lack of water and power.



Containment dike liner installed after the earthquake.



4. Other Collaboration between UN/ISDR and DG JRC

DG JRC has also collaborated in other ISDR initiatives since 2001:

- Contribution to "Natural Disasters and Sustainable Development: Understanding the links between development, environment and natural disasters" - Background Paper No. 5 for the World Summit on Sustainable Development (UNISDR, 2002)
- Member of Ad-hoc Discussion Group on Drought Vulnerability
- Member of Working Group 3 on Risk, Vulnerability and Impact Assessment of the Inter-Agency Task Force on Disaster Reduction
- Contribution to the global review of disaster reduction entitled LIVING WITH RISK
- Contribution to the 2002 United Nations World Disaster Reduction Campaign on Sustainable Mountain Development
- Participation in various Inter-Agency Task Force Meetings of the ISDR.

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