

## Second of Two Parts

# Emergency Telecommunications for Citizens in the EU: Communications between Authorities, Early Warning and Alerting Citizens

OLIVIER PAUL-MORANDINI

In the context of emergencies and disasters, emergency telecommunications cover communications from citizens to authorities, between authorities, from authorities to citizens and between affected citizens. This article covers the existing situation in all the areas mentioned above from a citizen's perspective and contains some proposals for action in view of ensuring further developments in this field. Part two deals with communications between authorities and from authorities to citizens and contains some proposals for action.

**A**lmost every emergency arising from everyday accidents requires the intervention of two or even three emergency services. Ambulances must help victims and the police have to regulate traffic around the scene of the accident, or must start investigations in case of criminal acts. Fire-fighters are often required to liberate victims from wrecked cars or from debris. They are the real protagonists in the case of fires—where the other emergency services are also required. All these interventions require communications between the emergency services involved. This becomes imperative in case of major incidents and disasters covering wide areas and necessitating the intervention of emergency services from different local or regional authorities or even (in the case of disasters with a European or international dimension) of multi-national, multi-discipline teams.

Today, it is well known that intercommunication between different emergency services in most of the EU Member States (in fact all over the world) is (in most cases) impossible in case of large scale joint operations in the context of major incidents or disasters. The main reasons given are the use of old radio systems operating in different frequency bands, the difficult or even impossible intercommunication between the relatively newer digital communication systems TETRA, TETRAPOL, GSM-BOS, etc., as well as the lack of common protocols and conventions at EU level for the communication between emergency services (TETRA, TETRAPOL, GSM-BOS sites).

The author does not consider himself to be a specialist in this field, as he lacks the appropriate technical knowledge. He has noted, however, that the publicly available documents with lessons learned from the September 11, 2001 disaster in New York, and the July 7, 2005 attacks in London, strongly underline the fact that the response of emergency services was hindered by multiple failures of communication systems and processes, as well as by technological limitations. The same documents stress the fact that emergency services urgently need improvements in telecommunications and technology capabilities to be able to face efficiently such events in the future (McKinsey, 2002; Commission 9/11, 2004; London Assembly, 2006). What would be the case if a similar disaster struck other EU countries? What about civil protection units coming together on the scene of a major emergency or

disaster within or outside the EU in the context of the recently upgraded Community Civil Protection Mechanism (EC Civil Protection site)? Fortunately, the EU has taken action in this field, although this has been done with considerable delay.<sup>1</sup> In 2001, the Council decision establishing the Community Civil Protection Mechanism provided (article 4b) that the European Commission shall *establish and manage a reliable common emergency communication and information system (CECIS) to enable communication and sharing of information between the monitoring and information center and the contact points designated for that purpose by the Member States* (Decision 2001/792/EC). The CECIS was fully operational in 2007.

In parallel, a report by a Group of Personalities in the field of Security Research published in 2003 by the European Commission recognizes the fact that a European Security Research Program (ESRP) should focus amongst others *on interoperability and connectivity as key elements of cross-border and inter-service cooperation* (EC—Security, 2003). In this context the EU has launched such a specific European Security Research Program with the interoperability of control and communications systems amongst its main priorities (MEMO/116 2005). Furthermore, until recently, emergency services have not been able to organize themselves at EU level in order to speak with one voice and establish their current and future requirements concerning emergency telecommunications. Since 2002, several attempts by unofficial groups of Public Communications Officers have been made to establish a common view and procedure (ETSI, 2005). Finally, in June 2006, the Forum for Public Safety Communication Europe was launched with the financial support of the 6th Community Framework Program for Research and Technological Development (PSC Forum site).

Several elements compromised the move of emergency services to the Information Society age and the progress of several projects aiming at the establishment of the emergency telecommunications environment of the future (MESA site). The abovementioned lack of a common approach from the professional users was one of them. Another was the fact that national industries have been trying to set the agenda in this field while unsuccessfully trying to impose it at the EU level. Furthermore, several issues concerning the efficient and effec-

tive coordination of emergency services on the basis of interoperable telecommunications systems are beyond the scope of standards setting bodies or technological fora. They include, amongst others, the use of common verbal and non-verbal communication protocols and conventions, the implementation of quality criteria for the services provided and the obligation for periodic evaluation by independent bodies.

The creation of the PSC Forum will certainly contribute to the establishment of a better understanding between industry and emergency services and will help the outcome of several EU-funded projects aiming at the use of TCP/IP and WiMax technologies by emergency services. Such projects include the following: U-2010 (Ubiquitous IP-centric Government & Enterprise NGN Vision 2010), ORCHESTRA (Open Architecture and Spatial Data Infrastructure for Risk Management), WIDENS (Wireless Deployable Network System), WIN (Wide Information Network) and DeHiGate (Deployable High Capacity Gateway for Emergency Services). Of course, well-established older technologies will contin-

ue being installed for some time, but WiMax systems will increasingly challenge them (for example, the new State-wide Wireless Network to be installed in the State of New York—SWN site—and the Citywide Mobile Wireless Network installed in New York City).

Another important issue in this area is the availability of bandwidth for advanced applications. The European Commission in its recent proposals for the reform of the European telecommunications regulatory framework, although ignoring the important issue of interoperability, seems to be taking good care of the bandwidth issue (COM 697, COM 480 2007).

### Authorities Communicating with Citizens

In case of an imminent disaster (approaching chemical or nuclear cloud, threat of a terrorist attack, upcoming tsunami or extreme weather conditions, etc.), authorities need first to be warned through risk-specific, regional networks and then rapidly alert large populations via telecommunications networks (radio, TV, sirens, GSMs, etc.) in order to guide them to safe areas until the danger is

over. Several international conferences on early warning systems for the reduction of natural disasters, have confirmed that effective early warning depends upon multi-sectoral and interdisciplinary collaboration among all concerned actors (EWC'98, 1998; EWC II, 2003; EWC III, 2006). Several major disasters hit the world in the last decade and unfortunately, many people were lost because of the lack of efficient early warning and alert systems.

Warning and alert systems and practices for citizens vary in the different countries of the EU. Siren and other audible alarm signals are provided for in several policy areas (safety in the workplace, nuclear and chemical plants, wartime alerts, dam-breaking alerts, etc.) and they are not standardized or harmonized. Test arrangements for such systems also vary between Member States. Additionally, Member States and local authorities have experimented with various new systems (intelligent sirens, mobile telephones, RDS car radios), but no generalized citizen-oriented solution has ever been proposed or implemented.

At the same time, EU citizens are clearly concerned about early warning and alert. According to the European Commission (Eurobarometer 51.1p 1999) a significant percentage of EU citizens (65.2 percent) feel unsafe when in another EU country for various reasons (they do not know the risks in the country, do not speak the language, feel that the emergency services are less well-organized, feel that signals and instructions are different, etc.). It is evident that special alarm arrangements are needed for non-residents in case of many types of potential accidents or disasters. Such an alarm may concern cross-border accidents or non-residents present in tourist areas. The possible risks include nuclear power plants, chemical factories (Seveso and non-Seveso), transport of dangerous goods (by highways, ports, railroads, pipelines), dams, areas prone to avalanches, landslides, floods, extreme weather conditions and volcano eruptions as well as hotels and other public places (fire risk, terrorist attack, etc.). With millions of tourists from the EU visiting high risk areas all over the world every year, this issue does not only concern the EU Member States but all countries accepting large numbers of EU tourists, as well as countries outside the Union, the citizens of which visit Europe every year.

The EU has already been made aware of the problems but without taking concrete action. The issue has been extensively discussed in the context of the Civil Protection activities

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mainly at a workshop on the technological aspects of modern warning and alarm systems (organized by the Finnish Ministry of Interior in the context of the major project on the information to the public—see MoI Finland, 2000), as well as in the context of the major project entitled “From Emergency to Crisis” (MoI Germany, 1999). The main conclusion of these actions was that alarm signals should not be linked with the type of the emergency (nuclear, chemical, natural etc.) but with the behavior expected by the population. More specifically, one signal should induce citizens to go indoors and stay there while another should incite them to evacuate closed spaces. These and other projects also concluded that warning and alert should be provided through multiple vectors (Volkmar Held, 2001), i.e. use of audible alarm signals and modern telecommunications networks (mobile telephones, pagers, RDS, digital radio and television, etc.) especially for people with disabilities. Supplementary information to the public could then be conveyed through classic communication channels (radio, television) or modern networks (mobile telephones, internet, etc.).

Several pieces of EU legislation cover the obligation for the provision of warning and alarm. Unfortunately, they fall under the responsibility of different policy areas and consequently their implementation remains uncoordinated. Directive 92/58/EEC on safety and health signs at work applies to safety in the workplace (in the policy area of Employment and Social Affairs). In its Annex VII it provides for a continuous acoustic signal for evacuation.<sup>2</sup> It also provides in its Annex I for regular check of the signaling devices. As the leisure area of one person usually is the work area of another, this directive could be applied in general for the warning and alarm of people in public places.

In another context, the Seveso II Directive 96/82/EC, which applies to a subset of chemical plants (in the policy area of Environment), provides for the inclusion of the organization of alert and intervention around the so called Seveso installations. It also provides that emergency plans should include arrangements for early warning of incidents, alert and callout procedures, as well as arrangements for providing the public with specific information relating to the accident and the behavior which it should adopt.

In another field, Directive 89/618/Euratom, which was adopted after the Chernobyl nuclear disaster, provides for the information of the public in case of radiological emergencies. This directive which applies to all types of nuclear installations and transport (and falls within the policy area of Energy) provides for information about emergency measures envisaged to alert, protect and assist the general public in the event of a radiological emergency.

Directive 2002/20/EC regulating the attribution of licenses for the operation of all types of electronic networks and services provides that Member States may establish specific terms for operators concerning the use of networks “during major disasters to ensure communications between emergency services and authorities and broadcasts to the general public” (see also COM 697, 2007). A special decision (Decision 676/2002/EC) covers issues pertaining to the allocation of radio spectrum (both these legal acts fall in the policy area of Information Society).

In 2005, the European Commission mandated ETSI to work on the implementation of Cell Broadcast (CB) for GSM networks, in the con-

text of ETSI’s EMTEL group (INFSO-COCOM site). Furthermore, CHORIST, a specific EU-funded project addresses the issue of population warning and alert on the basis of information from heterogeneous sensors and/or multiple agencies.

*Improvements Needed*

To better protect its citizens, the EU could use the previous acts as a solid legal basis for a European initiative in the field of warning and alert. Such an initiative would establish a legal obligation to warn, alert and inform citizens, in their own language, in case of an imminent disaster, by all available telecommunication means (radio, TV, GSM, siren, etc.). Information in this context would also cover the issuing of instructions about expected behavior in all possible cases of major disasters (nuclear, chemical, natural, terrorist, ...) even the obligation to ensure (simple and comprehensive) training well before the disaster. Finally, the initiative could ensure the implementation of quality criteria for the service provided.

Additional justification for such an initiative may be provided by the widening perception of the terrorist threat, the natural risks present in the European region (floods, storms, avalanches, etc.), the numerous EU citizens moving around feeling unsafe, the need for the approximation of legislations and the conclusions of several projects financed by the Community budget in the fields of Civil Protection, Research, Information Society, etc. The initiative may aim at the generalized use of the two existing audible signals (one for evacuation, one for confinement) and the testing of warning systems all over the EU on the same day (e.g. on February 11, which links with EENA’s proposal for the establishment of this day as the European Day of the single European emergency call number 1-1-2). It could also aim at the implementation of multilingual capabilities in special dissemination systems (RDS and digital radios, digital TVs, cell broadcast of messages), the coordinated use of communication networks for warning and alert of people with disabilities and the follow-up information of populations concerned. Finally, it could provide for specific measures for tourists and other non-residents as well as for the collaboration with broadcasters and NGOs (environmental, search and rescue, medical, etc.) who play a key role in warning and informing the public (see **Emergency Telecommunicators and Radio Amateurs sidebar, page 67**). The initiative could be periodically evaluated in view of taking further actions at Community level.

Of course, launching such an initiative means that several Commission services need to pull their act together and think in a creative way with their priorities aimed at serving the citizens. Maybe this is easier said than done—but the political clout of such an action would certainly be very important for the college of the Commissioners. This could be done in the context of the recasting of the Civil Protection Mechanism (Decision 2001/792/EC) although the final text adopted did not take into account the specific proposals of the European Parliament to establish a system for the early warning and alert of citizens in disaster prone areas. Several members of the European Parliament aware of this launched a written declaration which was signed by more than 410 members of the European Parliament, requesting the establishment of such a pan-European early warning and alert system for citizens (EENA site).

**Communication between Affected Citizens**

In case of personal emergencies and/or major incidents or disasters, citizens expect, above all, to be offered the possibility to communicate with their relatives, either to inform them that they are well or to get reliable

Table 1

When in danger within the EU, call for help the single European emergency call number 1-1-2

**THIS NUMBER CAN SAVE YOUR LIFE!** Report problems to the Citizens’ Corner at [www.eena.org](http://www.eena.org)

Table courtesy of EENA

## Emergency Telecommunications and Radio Amateurs

*An essential component not to be ignored.*

According to the International Amateur Radio Union (IARU),<sup>1</sup> assistance in emergency and disaster situations has a long tradition in the Amateur Radio Service. In recent years, the importance of this activity has increased further and has, in fact, also become a major argument in the defense of the Amateur Radio bands and in the protection of this valuable resource against potential interference by new technologies. In some countries, the role of the amateur radio service in case of emergencies and disasters is well established and organized or even institutionalized. In a large number of countries, however, hams can perform this important public service only in an improvised manner if and when a disaster occurs, something that may seriously affect the efficiency of what radio amateurs can contribute.

Radio amateurs have contributed over the years in situations covering all the aspects of emergency telecommunications mentioned in the main article.<sup>2</sup> They have been requesting assistance in case of accidents occurring in remote or isolated areas. They have facilitated the communication between emergency services in areas totally devastated by major disasters.<sup>3</sup> They have helped convey the message of authorities to remote or isolated regions and finally they have ensured that relatives from/at isolated areas were kept informed about the well-being of their relatives and friends. Using classical or satellite enabled equipment, radio amateurs have proven themselves indispensable in emergency and disaster situations.

### Notes

1. [www.iaru.org/index.html](http://www.iaru.org/index.html)
2. [www.rsgb.org.uk/emergency/newsboard.htm](http://www.rsgb.org.uk/emergency/newsboard.htm)
3. [www.aricc.org/](http://www.aricc.org/)

information about their condition. However, network availability and capacity have proven insufficient in several cases of major incidents and disasters to ensure such contacts. Instead, special telephone numbers may be established for relaying information through the access of centrally constituted files with names of victims and/or survivors. Additional initiatives may also include the information and training of citizens (especially youngsters, see OASP site) about the behavior they are expected to adopt in case of such events.

## Important Horizontal Developments

In May 2006, Senator Hillary Clinton proposed a new Federal Interoperable Communications and Safety Act in the U.S. (FICS, 2006). This act, which was never enacted into law, provided for a new Undersecretary for Emergency Communications and an Office of Emergency Com-

munications. The act provided for a National Emergency Communications Strategy to achieve redundant, sustainable and interoperable emergency communications systems, and required State and local governments to develop State-wide Interoperable Communications Plans. It provided for a national assessment of the interoperability capabilities

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at all levels at least every five years, as well as the creation of an Emergency Preparedness Center and the establishment of a National Alert System within a three-year deadline. This was the first time emergency telecommunications received such a high priority and the EU should implement something similar taking in account, of course, Europe's legislative and administrative traditions and structures.

In June 2006, the London Assembly published a report on the response to the bombings of June 7, 2005. The Report dealt in particular with communications issues and pointed out that *while the people involved performed outstandingly, the emergency communication systems and equipment that we're supposed to support them did not. Furthermore the report also pointed out that there is an overarching, fundamental lesson to be learnt from the response to the 7 July attacks, which underpins most of our findings and recommendations. The response on 7 July demonstrated that there is a lack of consideration of the individuals caught up in major or catastrophic incidents. Procedures tend to focus too much on incidents, rather than on individuals and on processes rather than people. Emergency plans tend to cater for the needs of the emergency and other responding services, rather than explicitly addressing the needs and priorities of the people involved* (London Assembly, 2006).

### Conclusions and Proposals

Emergency telecommunications concern, above all, the safety and security of citizens. With the mobility created by the internal market within the EU, the European Institutions should make serious efforts to ensure greater harmonization at EU level in this field. Work already undertaken should be encouraged and continued, while action should be initiated to cover new needs. Above all, the EU should declare its strong political commitment for improvements in this field and declare it a priority, something that is not the case today. Ensuring better and reliable emergency telecommunications in the EU means that procedures for the development of requirements and processes in specific areas need to be officially endorsed through multi-disciplinary, multi-sectoral, multi-services groups representing governments and working with the interests of citizens and victims in mind. Improving the 1-1-2 service chain, establishing rules for the interconnection and the interoperability of systems used by emergency services, ensuring that all EU citizens (residents and travelers alike) will be promptly

warned in case of an imminent disaster, are all highly political issues.

As a first step, the Council of EU Ministers should consider the issue in view of formulating a clear political mandate at the highest possible level. In parallel the European Parliament could continue playing a prominent role by keeping this issue on its agenda, as it has already done so on several occasions. Emergency telecommunications should be treated in a horizontal, interdisciplinary intersectoral and inter-services way within all European Institutions (Parliament, Commission and Council). The objective should be the adoption of binding legal acts for the organization, intercommunication and interoperability of emergency telecommunication services and systems for all emergency services/authorities, functioning in the context of commonly agreed quality levels. Some EU countries (e.g. Belgium) have already established structures and systems and are moving towards this direction. In other EU countries (UK, Netherlands, Scandinavian countries, Germany), providing high quality emergency services is already a legal obligation. Of course, given the investments involved and the rapid technological advances, decisions should be based on sound analyses of costs and benefits for citizens, emergency services and related industries.

Should the EU consider the creation of a special agency for Emergency Telecommunications? Should Emergency Telecommunications for European Citizens be one of the priority themes to be dealt with in the future European Electronic Communications Market Authority or within a not so useless Civil Protection Agency? Should the Commission set up a special task force to deal with Emergency Telecommunications in a horizontal and holistic way? These are questions to be replied at the highest political level, in view of the EU's pledge to serve its citizens.

Finally, the field of Emergency Telecommunications needs its own big periodic conference and exhibition where administrators and politicians, professional and final users, emergency services and private companies will be able to discuss their experiences, their needs and their products, in a horizontal and neutral way. Such an event could constitute a common discussion platform which will set requirements and help exchange best practices to enable the field to develop further in order to better serve citizens and the idea of Europe. As mentioned in part one of this article, EENA has already contributed in this direction by setting up an advisory board

with the participation of citizens, Members of the European Parliament, professional users (namely NENA, WADEM, WHO, IAEM, etc.) and industry representatives. Its objectives for 2008 include launching projects to inform and educate citizens on the 1-1-2, promotion of the allocation of increased budgets for the emergency services and the setting up of several 1-1-2 excellence centers in the EU.

### ENPM

*Olivier Paul-Morandini is the Founder and President of the European Emergency Number Association, a not-for-profit association (Brussels, Belgium). For more information on EENA, e-mail info@eena.org or visit the Web site at www.eena.org. An abridged version of the first part of this article was published in the June 2005 issue of the European Journal of Navigation (see www.gtc.nl).*

### Notes

1. "The Council of Ministers has repeatedly underlined the necessity for using data banks (1987), advanced telecommunications systems (1989, 1990) including aerospace resources (1990 - 1). The Council also considered desirable a system to make more effective use of existing specific information and to improve technical co-operation between rescue teams helping in emergencies outside their own countries or regions (1990 - 1). In 1994 the Council considered that the experience acquired in data transmission between Member States had demonstrated the need to set up a committee of users within the existing permanent network of national correspondents, arrangements to guide any new initiative in this field (1994)." See Council Resolutions in the field of Civil Protection—Developments since their adoption, Commission Staff Working Paper—SEC (2000)136 dated 24.01.2000 (EC Civil Protection site).

2. However, this is in contradiction with the ISO 8201 standard (Acoustics—Audible Emergency evacuation signal), which provides for a three pulse temporal pattern followed by an off phase.

### References

- COM 697 (2007) final—Proposal for a Directive amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and services, and 2002/20/EC on the authorization of electronic communications networks and services, Brussels, 11/13/2007.
- COM 480 (2007) final – Proposal for a Decision of the European Parliament and of the Council on the selection and authorisation of systems providing mobile satellite services (MSS), Brussels, 8/22/2007
- Commission, 9/11 (2004) The 9/11 Commission report, especially pages 336, 338, 339, 414; available at www.9-11.commission.gov.
- Decision 2001/792/EC—Council Decision of October 23, 2001 establishing a Community mechanism to facilitate reinforced cooperation in civil protection assistance interventions (2001/792/EC, Euratom) (OJ L 297, 11/15/2001 p. 7). An upgraded version of this decision was adopted in October 2007 and will be published in the Official Journal of the EU shortly.
- Decision 2007/162/EC—Council Decision of March 5, 2007 establishing a Civil Protection Financial Instrument (2007/162/EC, Euratom) (OJ L 71, 3/10/2007 p. 9).
- Decision 676/2002/EC—Decision No 676/2002/EC of the European Parliament and of the Council of March 7, 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision) (OJ L 108, 4/24/2002 p. 1).
- Directive 89/618/Euratom—Council Directive 89/618/Euratom on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency (OJ L 357, 12/7/1989 p. 31).

Directive 92/58/EEC on the minimum requirements for the provision of safety and/or health signs at work (OJ L 245, 8/26/1992 p. 23).

Directive 96/82/EC on the control of major-accident hazards involving dangerous substances (OJ L 10, 1/14/1997 p. 13) as modified by Directive 2003/105/EC of the European Parliament and of the Council of December 16, 2003 (OJ of December 31, 2003); consolidated version available at [http://ec.europa.eu/environment/seveso/pdf/unoff\\_cons\\_version\\_96\\_82\\_incl\\_amend.pdf](http://ec.europa.eu/environment/seveso/pdf/unoff_cons_version_96_82_incl_amend.pdf).

Directive 2002/20/EC of the European Parliament and of the Council of March 7, 2002 on the authorization of electronic communications networks and services (Authorization Directive) (OJ L 108, 4/24/2002 p. 21).

EC—Security (2003) Research for a Secure Europe: Report of the Group of Personalities in the field of Security Research available at <http://europa.eu.int/comm/enterprise/security/>.

EC—Civil Protection site at <http://ec.europa.eu/environment/civil/>. Also contains pages on the single European emergency call number 1-1-2.

EENA site—European Emergency Number Association at [www.eena.org](http://www.eena.org).

ETSI (2005), Public Safety User Requirements & Technology Solutions Workshop, February 23 – 24, 2005, available at <http://portal.etsi.org/workshops/Home.asp>.

Eurobarometer 51.1 (1999), Europeans & the environment, European Commission, Brussels EWC 98 (1998), International IDNDR Conference on Early Warning Systems for the Reduction of Natural Disasters, Potsdam. Documents and conclusions available at [www.gfz-potsdam.de/ewc98/](http://www.gfz-potsdam.de/ewc98/).

EWC II (2003), Second International Conference on Early Warning, Bonn. Documents and conclusions available at [www.ewc2.org](http://www.ewc2.org).

EWC III (2006), Third International Conference on Early Warning (EWC III), Bonn. Documents and conclusions available at [www.ewc3.org](http://www.ewc3.org).

FICS (2006)—Proposal for a U.S. Federal Interoperable Communications and Safety (FICS) Act, available at [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109\\_cong\\_bills&docid=f:s3172is.txt.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_bills&docid=f:s3172is.txt.pdf).

GSM-BOS site: [www.vodafone.de/bos](http://www.vodafone.de/bos) (in German). Info-Cocom site—Communications Committee at <http://forum.europa.eu.int/Public/irc/info/cocom1/home>.

London Assembly (2006)—Report of the July 7 Review Committee, London, June 2006, available at [www.london.gov.uk/assembly/index.jsp](http://www.london.gov.uk/assembly/index.jsp).

McKinsey (2002) Increasing FDNY's Preparedness, (see special chapter Improve communications and technology capabilities), available at <http://nyc.gov>.

MEMO/116 (2005) Security Research in the 7th Framework Programme prioritised amid high expectations, Press release, 4/7/2005, European Commission (available at <http://europa.eu.int/rapid/>).

MESA site at [www.projectmesa.org](http://www.projectmesa.org). Mol Finland (2000), Report of the Workshop on Information to the Public—Warning and Alarm System, Technical Aspects, Finland (available at <http://europa.eu.int/comm/environment/civil/>).

Mol Germany (1999), Final Report, Project From Emergency to Crisis—A Challenge for Civil Protection, Akademie für Notfallplanung und Zivilschutz im Bundesamt für Zivilschutz, Bad Neuenahr-Ahrweiler 1999 (available at <http://europa.eu.int/comm/environment/civil/>).

New York City (2006), Mayor Bloomberg announces selection of Northrop Grumman to build High Speed Wireless Data Network for Police Officers, Fire-fighters and other City workers, PR-326-06, 9/12/2006 (available at [www.nyc.gov](http://www.nyc.gov)).

OASP site—According to information made available from Greek authorities after the 1999 earthquake, many children indicated to their parents what they were expected to do on the basis of the extensive training programs conducted over the years by the Greek Earthquake Planning and Protection Organization (EPP0)—see [www.oasp.gr](http://www.oasp.gr).

PSC Forum site at [www.publicsafetycommunication.eu](http://www.publicsafetycommunication.eu), [www.psc-europe.eu](http://www.psc-europe.eu).

SWN site at [www.ofc.state.ny.us/ofc/swnindex.htm](http://www.ofc.state.ny.us/ofc/swnindex.htm).

TETRA MOU site at [www.tetramou.com](http://www.tetramou.com).

TETRAPOL site at [www.tetrapol.com](http://www.tetrapol.com).

Volkmar Held (2001), Technologische Möglichkeiten einer möglichst frühzeitigen Warnung der Bevölkerung (Kurzfassung); Technological Options for an Early Alert of the Population (Short Version) Schriftenreihe der Schutzkommission beim

Bundesminister des Innern Herausgegeben vom Bundesverwaltungsamt—Zentralstelle für Zivilschutz im Auftrag des Bundesministerium des Innern, German Ministry of

Interior, Bonn—available at [www.bbk.bund.de/dn\\_027/nn\\_402296/SharedDocs/Publikationen/Publikationen\\_20/Forschung/Band\\_2045.html](http://www.bbk.bund.de/dn_027/nn_402296/SharedDocs/Publikationen/Publikationen_20/Forschung/Band_2045.html).



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