

United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA)

Evaluation of the OCHA (DRB) Project on
Emergency Telecommunications
with and in the Field

Ryszard Struzak



United Nations
New York and Geneva
July 2000 Rev. 1 (September 2000)

1. *Preface*

This evaluation report reviews activities of the United Nations Office for Coordination of Humanitarian Affairs (OCHA) undertaken in the framework of "***Project on Emergency Telecommunications with and in the Field*** [DPR 121 (29)]", including those of the Working Group on Emergency Telecommunications (WGET). The report identifies major results achieved through the project as well as limitations and restrictions encountered. It also suggests (in Section 9) issues for consideration in further OCHA work on a coordinated approach to the use of telecommunications in the service of humanitarian assistance in the field.

The report takes into consideration primarily the present situation; however the overall review of past work covers the period since the First Conference on Disaster Communications held in 1990. The research leading to this report was done in the OCHA headquarters in Geneva; more detailed research would require field visits, which was not foreseen in the terms of reference of this evaluation. Although the report draws from opinions of various experts, it is only the author who takes the full responsibility for the contents of the report.

Acknowledgements

This report could not be possible without the contribution of numerous persons involved in humanitarian assistance and emergency telecommunications, who have provided necessary information and support. I would like to express my sincere gratitude to all of them.

Ryszard Struzak^{*}
ryszard.struzak@ties.itu.int

Geneva, 31 July 2000

* See Annex 1 - About the Author

2. *Executive Summary*

In the field, reliable communications is often a matter of life or death...

1. “Project on Emergency Telecommunications with and in the Field” is based on, and draws from, the collective experience and wisdom of members of the Working Group on Emergency Telecommunications. They identified the most important issues to be solved first, they applied appropriate ways to find solutions, and they achieved the best results possible. The Tampere 1998 Convention on Emergency Telecommunications is the most important achievement of the project (see Section 7). However, the ratification process is slow and should be speeded up (see Section 8).
2. The Tampere Convention created a new legal environment. Consequently, the OCHA's role and involvement in emergency telecommunications in the field should be re-examined in consultation with other partners in humanitarian assistance. The resources allocated to those activities should be adequate to the tasks undertaken. Feasibility of a joint OCHA/ITU unit, working on emergency telecommunications issues, and exploiting the combined resources of the two organizations, should be examined.
3. The major problems related to emergency communications in the field and still waiting for practical solutions, are as follows:
 - The problem of safety and security in the field
 - The problem of ad-hoc telecommunication services for the affected population
 - The problem of restoring normal telecommunication services to the affected population after the disaster.
 - The compatibility of equipment used in the field by various partners in international humanitarian assistance
 - Further development of OCHA's telecommunication capabilities in support of its FSCU, MCDU and UNDAC, and other UN partners (e.g. INSRAG) activities, as well as activities of other partners.
4. It is suggested to focus future efforts on creation and operation of a global emergency telecommunication/ information infrastructure, accessible 24 hours a day from any place on the earth (see Section 9).

3. Contents

1. Preface
2. Executive Summary
3. Contents
4. Glossary
5. Methodology
6. Background and Mandate of the Project
7. Main Achievements of the Project
8. Constraints/ Weaknesses of the Project
9. Further Activities for Consideration
10. Annexes
 - Annex 1. About the Author
 - Annex 2. Terms of Reference for the Evaluation of the OCHA (DRB) Project on Emergency Telecommunications with and in the Field DPR 121 (29)
 - Annex 3. List of Persons Consulted
 - Annex 4. Questionnaire (E-mail)
 - Annex 5 The Mandate of the Project on Emergency Telecommunications with and in the Field DPR 121 (29)
 - Annex 6. The Working Group on Emergency Telecommunications - Terms of Reference and Participants
 - Annex 7. Major activities of the Project
 - Annex 8 Telecommunication Coordination Officer
 - Annex 9 Financial Statement of the Project
 - Annex 10 Minimum Security Communications Standards
 - Annex 11. Inter-Agency Cooperation - the Mozambique 2000 case
 - Annex 12 Written Contributions/ Comments Received and additional material
 - a. A Sokolov: Computer Videoconferencing System Through Telecommunication Channels of Limited Bandwidth
 - b. Broadband LEO SkyBridge Network (www.europe.alcatel.fr/telecom/space/systems/skybridge)
 - c. Broadband LEO Teledesic Network ([www. teledesic.com](http://www.teledesic.com) [III Technology])
 - d. NIIR: Implementation of Videoconferencing System in Ukraine
 - e. Y Zoubarev: Space Multimedia Systems

4. Glossary of Abbreviations

ARRL	American Radio Relay League, Hartford CT
CPSC	Center for Public Service Communications, Washington DC
DARC	German Amateur Radio Association
DHA	Department of Humanitarian Affairs, UN (predecessor of OCHA)
DoS	US Department of State, Washington DC
DRCF	Disaster Relief Communications Foundation, UK
FAO	Food and Agriculture Organization of the United Nations, Rome
FCSU	Field Coordination Support Unit
FEMA	Federal Emergency Management Agency
GDIN	Global Disaster Information Network
GII	Global Information Infrastructure
GPRS	General Packet Radio Service
GPS	Global Positioning System
HALO	High Altitude Long Operation Network
HAP	High Altitude Platform
HF	High Frequency
HPM	High Power Microwaves
IAPSO	Inter Agency Procurement Services Office, Copenhagen
IARU	International Amateur Radio Union, International Secretariat, Hartford CT
IASC	Inter Agency Standing Committee, UN
IATCG	Inter-Agency Telecommunications Coordination Group, UN
IAWGET	Inter Agency Working Group on Emergency Telecommunications
ICET-98	Intergovernmental Conference on Emergency Telecommunications, Tampere, Finland, 1998
ICRC	International Committee of the Red Cross, Geneva
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Cross and Red Crescent Societies, Geneva
IIC	International Institute of Telecommunications
IMT	International Mobile Telecommunications
INSRAG	International Search and Rescue Advisory Group
IOM,	International Organization for Migration, Geneva
ISCC	Information System Coordinating Committee, UN
ITU	International Telecommunication Union, Geneva
LEO	Low-Earth Orbiting
LMDS	Local Multipoint Distribution Service
LOS	Line-of-Sight
MCDU	Military and Civil Defence Unit
MSF	Medecins Sans Frontieres, Brussels
NGO	Non-Governmental Organization
NOAA	National Oceanographic and Atmospheric Agency, USA
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
ODA	Overseas Development Administration, Foreign Office, London
PAHO	Pan American Health Organization, Washington DC
POP	Point of Presence
PTC	Pacific Telecommunication Council
PSWNP	Public Safety Wireless Network Program, USA
SDR	Swiss Disaster Relief Unit, Department of Foreign Affairs, Berne
SIG-TAG	Special Interest Group - Telecommunications Advisory Group
SRSA	Swedish Rescue Services Agency, Ministry of Foreign Affairs, Stockholm
TC	The Tampere Convention 1998 on Emergency Telecommunications
TCO	Telecommunications Coordination Officer
TCP/IP	Transfer Control Protocol/ Internet Protocol
UHF	Ultra High Frequency
UN	United Nations
UN (DAM)	United Nations Department of Administration and Management, New York

UN (DPKO)	United Nations Department of Peace Keeping Operations, New York
UN (OCHA)	United Nations Office for the Coordination of Humanitarian Affairs
UNDAC	UN Disaster Assessment and Coordination
UNDP	United Nations Development Programme, New York
UNDRO	Office of the United Nation Disaster Relief Coordinator (predecessor of DHA)
UNEP	UN Environment Programme
UNHCR	Office of the United Nations High Commissioner for Refugees, Geneva
UNICEF	United Nations Children's Fund, New York
UNOG	United Nations Office at Geneva
UNOV	United Nations Office at Vienna
UNRWA	United Nations Relief and Works Agency, Vienna
UNSECCORD	UN Security Coordinator
UNV	United Nations Volunteers Programme
URL	Uniform (or Universal) Resource Locator
URSI	International union of Radio Science, Brussels
US	United States of America
USAID/OFDA	US Office of Foreign Disaster Assistance, Washington DC
VHF	Very High Frequency
VSAT	Very Small Aperture Terminal
WAP	Wireless Applications Protocol
WB	The World Bank
WFP	World Food Programme, Rome
WGET	Working Group on Emergency Telecommunications
WHO	World Health Organization, Geneva
WMO	World Meteorological Organization, Geneva
WTDC	World Telecommunication Development Conference (ITU)
WV	World Vision, Washington DC

5. *Methodology*

1. Following the Terms of Reference for the Evaluation of the OCHA (DRB) Project on Emergency Telecommunications with and in the Field (see Annex 2), this evaluation report is based on records of activities under the project (including those of the Working Group on Emergency Telecommunications). It takes into account also various publications related to telecommunications in disaster mitigation and response operations, and the following views:
 - Views of UN entities
 - Views of humanitarian organizations not belonging to UN
 - Views of individual experts
 - Views of the management of OCHA, the administrative services involved and the auditors presently reviewing OCHA projects
2. To give the possibility to comment on the project, a questionnaire was distributed via email among all Members of Working Group on Emergency Telecommunications on 7 July 2000, inviting them to contribute to the evaluation process. In addition, all participants of the 12 July 2000 Inter-Agency Meeting were informed about the evaluation process and the questionnaire, and were invited to submit comments and proposals.¹
3. The list of individuals consulted is presented in Annex 3. Interviews, and especially telephone interviews, were found cumbersome, as no special preparation for the interviews was possible within the time limits allowed. A number of persons preferred first to have the draft evaluation report in hand and then they would make their comments. Consequently, I sent this manuscript to the persons listed in Annex 3. Written contributions received are annexed to this report (Annex 12).
4. During this evaluation, it was not possible to obtain views of auditors reviewing OCHA projects mentioned in the terms of reference (Annex 1, item 4) and formal financial statement from the financial services were not available.

¹ One person told that the questionnaire was unclear. The answer was that it repeated exactly the formulations from the original terms of reference for the evaluation of the project. A special preparatory meeting could be organized to discuss the questionnaire and clarify all potential doubts, but this was not foreseen in the terms of reference and time schedule.

6. Background and Mandate of the Project

1. The UN **Office for Coordination of Humanitarian Affairs (OCHA)** is mandated to mobilize and coordinate the collective efforts of the international community, in particular those of the United Nations system, to meet in a coherent and timely manner the needs of humans exposed to suffering and material destruction in disasters and emergencies. This involves reducing vulnerability, promoting solutions to root causes and facilitating the smooth transition from relief to rehabilitation and development². OCHA, created in 1998 as the successor of DHA and UNDRO, carries also two other tasks: development of humanitarian policy, and advocacy of humanitarian concerns. In addition to these functions, OCHA was responsible for the International Decade for Natural Disaster Reduction (IDNDR), designated in 1989 by the UN General Assembly Resolution 44/236. It also hosts the Secretariat of the Inter-Agency Standing Committee (IASC). The IASC comprises the UN agencies with humanitarian mandates, the World Bank, the Red Cross Movement, and NGO consortia. OCHA considers itself as a key body, but its concept of an overall-lead agency is questioned by some partners in humanitarian assistance as unworkable in practice³, basing on their experience, and especially in view of the "coordination vacuum" suffered during the Kosovo crisis⁴.
2. OCHA is expected to coordinate, harmonize, cooperate, consult, negotiate, and assist all those involved in humanitarian affairs. It includes facilitating the access to various specialized databases necessary in emergencies but distributed among various entities, often located at different continents. And all that is to be done without delay, in the field, in a disaster environment. Clearly, none of these activities is possible without reliable telecommunications; in the field, communications is often the question of life or death. To complete the picture, I have to add that the use of telecommunications by UN agencies and by non-governmental entities involved in humanitarian assistance has been a difficult and sensitive issue, with potential implications of political and technical nature. In spite of the globalisation trends, our world of today is fragmented, and each sovereign country has its own system of laws, regulations, standards, and practices. Governments are often unwilling to allow importation and use of wireless telecommunication equipment by foreigners. One reason is potential interference of radio waves among incompatible applications. As a consequence, using telecommunications with and in the field often necessitates in difficult and time-consuming negotiations.

² Mission Statement; OCHA in 2000; United Nations, New York and Geneva, 2000

³ World Disasters Report 2000; International Federation of Red Cross and Red Crescent Societies, p. 42

⁴ World Disasters Report 2000; International Federation of Red Cross and Red Crescent Societies, p. 115-116

3. Emergency Telecommunications has been conceived to satisfy the needs of humanitarian assistance before, during and after emergencies. *"In all emergency operations, high-risk decisions must be taken early on, often based on unverifiable government estimations. Facts change wildly from day to day. Search and rescue, medical relief, food aid, shelter and rehabilitation issues all [have] to be assessed and prioritised almost simultaneously."*⁵ In rescue and relief operations, tight time limits, combined with surrounding post-disaster chaos and the limited resources available, impose the highest demands on the management, logistics, and coordination efficiency. The necessity of rational use of available resources in uncertain conditions often require a series of consecutive assessment, analyses, and decisions, all in a very short time. Quick action is imperative, as each delay translates directly into loss of life and/or property. Only a reliable two-way exchange of information between cooperating people can make it possible. More and more often, rescue and relief operations require expert consultations, often not available in the field at the time when they are needed. In addition to the voice and facsimile messages, high resolution aerial or satellite photographs, thematic maps, measurement results, videotaped scenes, computer simulations, computer databases, computer software, etc. need to be exchanged. When more than one organization is involved in the process, all formats and protocols possible can be used.

4. This was the rationale why the **“Project on Emergency Telecommunications with and in the Field”** was launched. The tasks were outlined first in the recommendations of the 1990 Disaster Communication Conference, detailed in the Tampere Declaration of 1991 and endorsed by the World Telecommunication Development Conference and the ITU Plenipotentiary Conference of 1994. Creation of an appropriate instrument was considered the most urgent and most important issue. Martin Griffiths, then Director of DHA in Geneva, summarized: *“Principal among our tasks is the need to develop and detail practical steps for facilitating the rapid deployment and effective use of communication equipment for emergency operations by reducing and, where possible, removing regulatory barriers and strengthening cooperation between states”*⁶. He specified the following major issues to be addressed by the project:
 - Custom clearance procedures and duties
 - Restrictions on possession and use of equipment
 - Removing inappropriate restrictions on the dissemination of information
 - Type-approval procedures and operating licenses
 - National rules concerning temporary assignment of radio frequencies
 - Entry, exit, and transit for personnel, equipment and property
 - Direction and control of assistance
 - Confidentiality of information
 - Privileges, immunities and facilities
 - Claims and compensations.

The mandate of the project is given in Annex 5.

⁵ World Disasters Report 1999, p. 52

⁶ Griffiths M, Director DHA Geneva: Remarks to the IAWGET, 16 November 1994

7. Main Achievements of the Project

1. The **Tampere Convention on Emergency Telecommunications** is the most important achievement of the project. It is the result of various activities, starting with the UNDRRO Conference on Disaster Communications, Geneva 1990, and culminating with the Intergovernmental Conference on Emergency Telecommunications, Tampere, Finland, 1998, (ICET-98) that finally adopted the convention (see Annex 7) The Tampere Convention "*provides the framework for the use of telecommunications in international humanitarian assistance, removes regulatory barriers, and protects providers of telecommunication assistance while safeguarding the interests of the host country*"⁷. It satisfied the requirements (often contradictory) of all parties interested, being the best compromise possible at the time of its adoption.
2. Article 2 of the convention sets general rules and defines the role of the **UN Emergency Relief Coordinator** as the operational coordinator for the convention, especially as concerns the telecommunication assistance (Art. 8) and regulatory barriers (Art. 9). Cooperation among States and with non-State entities to facilitate deployment and use of telecommunication equipment to predict, monitor, and provide information concerning natural hazards, health hazards, and disasters is covered by Articles 3 and 4. Article 6 sets rules on how to request, provide and terminate the international assistance. The privileges, immunities and facilities afforded to persons acting pursuant the convention are defined in Art. 5 and rules on payment or reimbursement of costs - in Art. 7. Article 16 states that the UN Secretary General is the depositary of the convention. Such an instrument, regulating the provision of telecommunication resources for disaster mitigation and relief operations, has been created for the first time since the initiation of the UN humanitarian assistance. Without the effort of OCHA and its predecessors, the Convention would not exist. Now, test of life will show its true value.
3. The Tampere Convention is applicable by **reference** in all bi-lateral and multi-lateral agreements even between and with states that are not yet party to the treaty.
4. The Tampere Convention is a pilot treaty setting rules of protection of non-state-entities engaged in disaster rescue and relief activities. It creates a **new legal environment** for all entities involved in humanitarian assistance activities, including non-state entities, such as private-sector enterprises, and defines new responsibilities of the UN Emergency Relief Coordinator, specified in Articles 2, 3, 4, 6, 7, 8 and 9 of the convention.
 - a. To discharge the responsibilities resulting from the Tampere Convention, it is suggested that emergency telecommunications issues with and in the

⁷ Excerpt from "Tampere Convention 1998", Published by the ITU

field continue to be among the major OCHA's responsibilities included into its statutory functions. This suggestion is in line with opinion of WGET that "...strongly recommends that the United Nations Emergency Relief Coordinator maintain continuity in the United Nations efforts in support of emergency telecommunications, especially with respect to the Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations"⁸.

- b. It is suggested further that the working relations between OCHA and other entities involved in humanitarian assistance be reviewed, taking into account the provisions of the convention and the need for efficient utilization of the limited resources available.

5. The **Working Group on Emergency Telecommunications (WGET)** mechanism was created and widely used throughout the project⁹. The WGET is a subgroup of the Inter-Agency Standing Committee (IASC) and serves as the Steering Committee of the OCHA project on emergency communications. It is an open forum created to facilitate the use of telecommunications in the service of humanitarian assistance by all international partners involved. It comprises seventeen UN entities, including the ITU, major NGOs, and the ICRC, as well as of experts from the private sector and academia. Its terms of reference and composition are given in Annex 6. Its documents have a non-binding, advisory character. The group has played an important role in coordination of activities among various entities and in preparations of Tampere Convention and in exchange of relevant information. The members have valued the group's activities and are of the opinion that it should keep its informal open character with minimal institutionalisation¹⁰. However, there may be situation in future where more formal working methods would be needed to assure a legal status of WGET decisions/recommendations.

- It is suggested that the activities of the working group be continued. Its terms of reference, internal structure, and working methods, should be reviewed to fully reflect the responsibilities of the UN Emergency Relief Coordinator as the Operational Coordinator under the Tampere Convention.

6. OCHA maintains the **WGET Secretariat**. Its services have been valued by the group: "*The WGET recognizes the excellent work accomplished by DHA, Geneva, as the Secretariat for the WGET, and requests DHA to continue in this function, which facilitates the exchange of information and the coordination among WGET participants.*"¹¹

- It is suggested that OCHA continue the secretarial support of the working group.

⁸ Resolution of the 6th Plenary Meeting of WGET

⁹ The group started as Inter Agency Working Group on Emergency Telecommunications (IAWGET) in 1994

¹⁰ Minutes of 4th WGET Meeting item 7

¹¹ Resolution of the 6th WGET Meeting, and Resolution of the 4th WGET Meeting

7. The OCHA **ReliefWeb** has proven its great utility as electronic clearinghouse for the WGET members. (In fact - for all those needing timely information on humanitarian emergencies and natural disasters, designed specifically to help the humanitarian community improve its response to emergencies). Among other documents, it contains minutes of WGET meetings and archive, available for those authorized. However, during my research, some documents could not be found where they were supposed to be, and other documents were incomplete or out-of-date. It might be because some documents were submitted as paper copies only (as it might be the case of report on a pilot study sponsored by UN, ITU, and ICO¹²), or because the material was maintained by external entities that did not inform the OCHA Webmaster about the changes they made, as it might have also happened to missing images.
- It is suggested that OCHA continue posting information relevant to emergency communications at the ReliefWeb keeping it, as much as practicable, complete, updated, well organized and easy-to-find. The ReliefWeb is a powerful interface between OCHA and the external world; its public part is visited four million times a month. In addition to its basic informative functions, it creates the image of the OCHA.
 - To facilitate the work and to improve transparency, it is suggested that the documentation posted contain not only minutes of meetings, but also the yearly plan of meetings. The draft agenda and complete sets of documents considered at the meeting should be available on the Web ahead of the meeting date (e.g. two weeks), to allow participants some time for preparation. The recommendations/ decisions of the group should be posted in a separate section. This would require the WGET members' contributions to be delivered in electronic format, and OCHA may wish to issue appropriate instructions. The membership list should contain full addresses of the members.
 - It is suggested that the WGET members should maintain a link to the WGET website, in line with the WGET proposal¹³.
8. Another result of WGET activities that should be mentioned here is the agreement concerning the concept and duties of **Telecommunication Coordination Officer**. The tasks of the coordination officer are given in Annex 8.
9. The agreement has been reached on standard telecommunication **frequency channels**^{14 15} for safety and security and for on-site coordination. Mozambique is an application example (see Annex 8). These frequencies have been agreed internally, among the WGET members. However, they are not protected under international Radio Regulations. As a consequence, they may unintentionally be

¹² Minutes of the 8th WGET Plenary Meeting, p. 8, Item 10,

¹³ Minutes of the 8th WGET Plenary Meeting, p. 8, Item 16

¹⁴ Frequencies for the Common Safety and Security Channels for International Disaster Relief Operations agreed by the Fifth WGET Plenary Meeting, Geneva, 20/21 May 1997 – [www. Reliefweb.int/wget/5CHAN.html](http://www.Reliefweb.int/wget/5CHAN.html) (7 July 2000)

¹⁵ Proposed Standard Safety and Security Channels in Bands Allocated to the Mobile Service; WGET Document 4; 6 April 1999; www.reliefweb.int/wget/8DOC4.html (7 July 2000)

interfered in the field by other users of radio, not necessarily known or easy to identify. It can make these frequencies practically useless at least during the initial phase of an emergency action. An international recognition should be sought via the ITU World Radiocommunication Conference mechanism¹⁶.

10. The OCHA activities in the project have been closely tied with those of the **International Telecommunication Union (ITU)**. OCHA represents UN in major ITU conferences and maintains link between these two organizations. As the specialized UN agency dealing with telecommunications standardization, regulation, and development, the ITU has played a special role in the OCHA project on emergency telecommunications. Its Radio Regulations (RR), reviewed and up-dated every two years at World Radiocommunication Conferences (WARC), is the central treaty on international uses of radio. The first regulations concerning emergency telecommunications are dated 1912, well before the whole UN system was created. The ITU World Telecommunication Development Conference (WTDC), Buenos Aires, 1994, supported (via its Resolution No. 7) the 1991 Tampere Declaration. The ITU Plenipotentiary Conference, Kyoto, 1994, endorsed the OCHA approach in its Resolution 36. The ITU WTDC, Valletta, 1998, endorsed the OCHA draft convention. The ITU contributed to the preparations of the Tampere Convention and, after its adoption, the ITU Plenipotentiary Conference, Minneapolis 1998, urged (via its Resolution No. 36, initiated by OCHA) all Member States to work towards its ratification. In its Resolution No. 98, the conference appealed to ITU Member States to ensure that humanitarian personnel could use telecommunication resources required for their safety and security in an unhindered and uninterrupted way. The World Radiocommunication Conference 2000, Istanbul (Turkey) reviewed Resolution 644 and adopted Resolution [GT Plen-2/5] on global harmonization of spectrum for public protection and disaster relief. The ITU has developed regional presence and working arrangements that might be useful in discharging the new responsibilities of OCHA related to emergency telecommunications.

- It is suggested that the exiting close relations between ITU and OCHA be continued and strengthened. For that purpose, they may wish to create a common OCHA/ITU working group to review the tasks and to identify areas of common interest where a joint work and/or resource sharing would be practical and to propose specific actions/ projects.

11. The work towards increasing the **awareness** of international cooperation facilitating the use of telecommunications in humanitarian assistance was an important element in the project. It included a series of conferences and workshops at various levels and training programmes (see Annex 7). Now, after the Tampere Convention, this kind activity needs to be continued taking into account the provision of the convention. Here, sharing information about the conclusions drawn from past events would be of great benefit to all.

- It is suggested that this activity be continued, taking into account the tasks generated by the Tampere Convention.

¹⁶ I was informed that this has already been initiated

12. The project offers expertise to FCSU/MCDU and maintains, in cooperation with UNOG, a HF radio data network. The latter provides cost-effective links to field offices of several agencies, including OCHA, WHO and UNDP. That should be continued.
13. It seems that there are some initiatives planned in parallel with the OCHA project, as the UN Secretary General has recently announced: *“I am pleased to announce the launch of a new disaster response programme, which will provide and maintain mobile and satellite telephones as well as microwave links for humanitarian relief workers”*¹⁷. That new programme lead by the Ericsson Corporation is not yet reflected in the documentation of the project in hand, and there may be other similar cases.
- It is suggested that all initiatives concerning the emergency communications be communicated to the WGET secretariat and relevant information be posted on its Web site.
 - It is suggested that OCHA make efforts to assure that the private sector activities in emergency telecommunications are appropriately coordinated as any parallel-uncoordinated actions lead to waste resources.
 - It is suggested that OCHA produce and publish on ReliefWeb information on desired features to be recommended for the equipment used by the UN and other entities involved in humanitarian assistance in the field. It could then be used as guidelines in selecting appropriate systems, in the development of new systems and services, and in standardisation work.
14. In summary, the **“Project on Emergency Telecommunications with and in the Field”** is based on the collective experience and wisdom of the WGET members. They identified the convention creating the necessary legal framework as the most important issue to be solved first. They applied an appropriate way to find solutions, and they achieved the best results possible. The whole humanitarian assistance community and - more importantly - all the people hit by disasters will benefit from their work, I believe. Nevertheless, there is still a lot to do, as detailed in the following sections.

¹⁷ We the peoples: the role of the United Nations in the twenty-first century. Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000, item 347

8. Constraints and Weaknesses of the Project

1. Someone familiar with the UN Chart, but not familiar with all inherent limitations build in the UN mechanism, might conclude that after ten years the OCHA project did solve once forever all the problems of emergency telecommunications in the field. However, it would be a false conclusion. The main reason is that the tasks and budgets of UN entities are treated separately from each other, which makes the effective work difficult. The UN Secretary General addressed recently that dichotomy once more: in spite of grandiose programme set for the UN, its total budget for UN core functions (\$1'250 million) is “*about 4 per cent of New York City annual budget*”¹⁸. The human resources involved in the OCHA project on emergency telecommunications consist of about 0.2% of total human resources of OCHA (only one person - 50% time of one professional UN staff plus 50% time of one consultant on a temporary contract). Also, extra-budgetary requirements of the project were below 1% of those of OCHA¹⁹. The financial report is given in Annex 9²⁰. The relative size of the resources engaged indicates that that emergency communications is really not seen as a key factor contributing to the success or failure of OCHA field operations, in spite of public declarations at various levels.
 - It is suggested that the OCHA's role and involvement in, and resources allocated to, the issues of emergency telecommunications in and with the field be re-examined in consultation with other partners in humanitarian assistance. Feasibility of a joint OCHA/ITU unit working on emergency telecommunications issues, and combining resources of the two organizations, should be investigated.
2. The **ratification process** of Tampere Convention is slow. During the two years that have passed since the convention was open for ratification, only four countries have ratified it, whereas thirty ratifications are required by June 2003 for entry into force. Additional promotional efforts are needed to assure reaching the main goal of the project, although countries may sign it in the last minute. A possible scenario could include the following suggestions.
 - It is suggested that OCHA implement the Plan of Action (see Annex 5). In particular:
 - Additional explanatory material should be prepared, containing appropriate data sheets and copies of selected articles about emergency telecom-

¹⁸ We the peoples: the role of the United Nations in the twenty-first century. Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000, item 353

¹⁹ OCHA in 2000. Activities and extra budgetary requirements, p. 3, 4, and 95, Relief-Web 12 July 2000

²⁰ The financial report was unavailable at the time of writing this evaluation. In this connection it is suggested that more attention should be given to improve the financial control/ reporting/ tracking of OCHA activities.

munications and the convention, including an example of model agreement to be developed (TC Art. 3.4a)

- The WGET members should be urged to lobby through their organizations' channels, using the promotional material mentioned above.
- Special meetings should be organized for the heads of diplomatic missions and journalists, especially those from disaster-prone countries. The material mentioned above could be useful there.
- A series of promotional visits/ seminars should be organized in various countries. Members of parliament, and local activists in humanitarian organizations should be invited, in addition to the government representatives. It might work well in disaster-prone countries (and especially before elections, if ones are planned in the meantime). The material mentioned above could also be useful there.

3. International agreements are necessary to create a legal framework enabling people to operate freely, but it is insufficient, and must be complemented by other elements. In any coordination activity, the information required by the cooperating partners must be available where it is needed, when it is needed and in the usable format. Because of unforeseeable nature of disasters, such an information exchange must be possible between headquarters and any point on the globe, 24 hours a day. The problem is, however, that such a **global emergency telecommunication system does not exist**, and had never been attempted. The existing Global UN Telecommunication Network connecting regional offices is not easily accessible in the field. A number of telecommunication systems were demonstrated and discussed at the WGET meetings; however, none has satisfied the needs^{21 22} of disaster communications. In our fragmented world, the integrating/ converging trends compete with separating/ diverging ones, and there is some opposition against globalisation, visible at various demonstrations. Political division and mutual distrust combined with a fear of foreign dominance kept telecommunication sector monopolized in all countries. Wealthy societies developed telecommunication networks to satisfy their own needs, and had no incentives to extend them over poor regions unable to return the investments. Moreover, the communication technology necessary to implement such an idea at an affordable cost was unavailable until recently. As a consequence, the current emergency telecommunications is a patchwork of various technologies, protocols, and equipment, not always working together smoothly. And it is so because they were not designed to work together; they were created originally with other applications in mind. This fragmentation creates serious problems in the field that only new technology can solve at a reasonable cost; the issue is discussed further in the following section.

4. One serious problem still waiting for a practical solution is **security and safety in the field**. In 1977 alone, 65 UN staff members were killed while on duty, 55 'disappeared', 47 were abducted and held hostage, and many more were subject

²¹ Minutes of the 7th WGET Plenary Meeting, Item 9

²² Minutes of the 8th WGET Plenary Meeting, p. 8, Item 11

to assault, abuse, and rape²³. Earlier this year, the whole UN peacekeeping troops had to surrender to Sierra Leone rebels because they “*were unable to call for help for lack of radio equipment*”²⁴. The incapacity to assure safety and security of field staff is humiliating the OCHA, the whole UN system, and all of us. This situation cannot be tolerated; it deserves serious consideration²⁵.

5. Several entities have been involved in the safety and security issues, including Security Council, Information Systems Coordinating Committee (ISCC) its Sub-Group on Telecommunications for Safety and Security, Special Interest Group - Telecommunications Advisory Group, and a number of international conferences. Although it is probably beyond the terms of reference of this evaluation, I would like to remind here an old truth that good coordination requires a single coordinating body. It is especially important in view of a large number of entities involved in humanitarian assistance: in the Kosovo crisis, for instance, there were 200 agencies competing²⁶. Multiplying bodies involved in coordination not necessarily accelerates the work or improves its quality; on the contrary, might be counterproductive. The safety and security sub-group (see Annex 10) is producing guidelines for the UN Field Security Handbook. But no Handbook can provide the necessary communications, safety and security in the field. All international treaties and agreements are unable to do so, either. As mentioned earlier, they are necessary but insufficient. The Vienna Convention on UN privileges and immunities is in force since 1946. The 49th session of the UN General Assembly was addressing issue, so did 1994 Ad-hoc Interagency Meeting; as well as the UN Security Council of 19 June 1997, etc. What is the net result? We witness an increasing wave of killings, kidnappings, and similar acts of violence. Agreements, conventions, and appeals to ensure the safety and security of UN personnel and personnel of humanitarian organizations involved have been insufficient till now. Can a new agreement or appeal change the situation? A good will, capacity to control of all elements indispensable for implementation of agreements and instant reliable telecommunications are necessary, and most often they are lacking in the field. Instant access to reliable telecommunication network from any place at any time is an element necessary to make any improvement in the safety and security of the personnel in the field.
6. Closely related to personal safety are problems of **privacy, safety and security of information**, and equipment, such as vehicles, for instance. The open character of radio communications and vulnerability of computer systems implies severe privacy and security problems. It might be unimportant in the case of natural disasters, but might be critical in the case of civil wars and unrests. Mes-

²³ Farrell G: Saving the Lives of Those who Save Lives; Global Communications Interactive 1998, p. 48-49.

²⁴ Hoyos C: Once-bitten UN Peacekeepers Shy Away from Trouble; Financial Times, 4 July 2000

²⁵ Some administrative action has already been initiated, see Russler D (Ms), Deputy UN Security Coordinator: Memorandum to All Security Focal Points on the Report of the Ad Hoc Inter-Agency Meeting on Security, 21 June 2000

²⁶ World Disaster Report 2000, International Federation of Red Cross and Red Crescent Societies, p.19

sages can be intercepted, and computers can be paralysed for terrorist purposes. The recent “Love me” virus attack was a sample of what may happen. **Electromagnetic attacks** create potential danger even greater than the viruses^{27 28}. They consist in criminal uses of intentionally generated high-power microwave (HPM) radio waves to disrupt or to damage at distance the operation of electronic devices and systems. Telecommunication equipment, computers, or electronic security systems are examples of highly vulnerable systems to such attacks. For instance, a GPS receiver can be jammed, or a running vehicle can be stopped instantly on the road by irradiating it from distance by electromagnetic waves. Most of all components necessary to build electromagnetic weapons of that kind can be found on the open market, in an easy reach of terrorists²⁹. In view of increasing number of cases of such attacks on civilian objects, the 1999 General Assembly of International Union of Radio Science (URSI) issued a resolution on the problem³⁰. The issue of equipment safety in the field should not be underestimated, either. The dangers could be reduced by application of appropriate technical and operational means, but never eliminated. The field operations staff should be aware of these problems, appropriately trained and assisted when needed. However, with the existing telecommunication technology, it is practically impossible to improve the personnel safety, in my opinion, and potential solutions are discussed in the next section.

- It is proposed that issues of safety and security of personnel, equipment, and information in the field be given necessary priorities in OCHA activities. It should involve all partners in humanitarian assistance, and appropriate preparedness guidelines and action plans should be elaborated.

7. **Shared use of telecommunication** equipment by various entities involved in the field should strongly be encouraged and facilitated. However, the existing arrangements not always work as expected. The application of new technology would be a radical solution here, but even with today’s equipment there seems to be space for improvements. Here, Mozambique case can be quoted as a good example (see Annex 11)

- It is suggested that OCHA establish a joint financing mechanism and costs sharing at headquarters level, thus bypassing some of the local problems in the field. This would include agreements on simplified billing procedures necessary for shared use of expensive emergency telecommunication facilities in the field by the various entities involved.

²⁷ Gardner R: Electromagnetic terrorism. A real danger; EMC 1998 - Proceedings of Fourteenth International Wroclaw Symposium on Electromagnetic Compatibility, Wroclaw (Poland), June 23-25, 1998, p. 10-14

²⁸ Wik M: Global information infrastructure - Threats; Global Communications Interactive 1999, p. 30-40

²⁹ Wik M: Revolution in Information affairs; Global Communications Interactive 1999, p. 2-26

³⁰ Gardner R: Requirements for mitigation in intentional electromagnetic interference; EMC 2000 - Proceedings of Fifteenth International Wroclaw Symposium on Electromagnetic Compatibility, Wroclaw (Poland), June 27-30, 2000, p. 466-468

- It is suggested that OCHA ensure that emergency telecommunication costs are systematically included explicitly in the consolidated inter-agency appeal process³¹.
8. The problem of **telecommunication services for the affected population** could not be solved satisfactorily in most cases. The capacity of ad-hoc telecommunication networks created to coordinate relief activities in the field is insufficient to satisfy also the communication needs of the population. I believe, a satisfactory solution of that problem could be offered only by the application of new technologies, such as described in the following chapter for instance. Another problem is related to finances. Food and shelter are offered at no charge to the affected population during humanitarian actions, but no telecommunication services. This policy deserves a review in the 21st century, claimed as the era of Global Information Society.
- It is suggested that OCHA initiate action aiming at including telecommunication services to affected population in the list of items offered at no charge³².
9. **Restoring telecommunication services** to the affected population after the disaster strike is another problem of fundamental significance^{33 34} waiting for a practical solution. The new technology is capable of solving that problem - missing is political will and financial support.
- It is suggested that OCHA initiate appropriate action of UN agencies humanitarian entities involved, including the World Bank, ITU, and the private-sector business, aiming at establishing common policy and projects related to the restoration of telecommunication services to the affected population after the disaster strike.
10. Despite considerable funds invested in disaster response, the international community has been slow to recognize the need for consistent, authoritative objective and detailed **data collection** on disaster occurrence, its effects and costs, and on related **research** activities. The World Disasters Report 2000 states: “[the international community] *has not been willing to invest the capital and authority necessary to allow any one institution to take on the role of prime providers of verified data*³⁵.” As a result, the available data being “*at best patchy*”, cannot serve as a firm basis to draw quantitative conclusions on emergency communication issues and global strategy.

³¹ Draft minutes of the 9th WGET Plenary Meeting, item 6w

³² It is in line with the WGET opinion, see Draft minutes of the 9th WGET Plenary Meeting, item 6m, 6n

³³ Draft minutes of the 9th WGET Plenary Meeting, item 6l

³⁴ Struzak R: Building information infrastructure in rural areas; Global Communications Asia '97; p. 227-233

³⁵ World Disasters Report 2000, International Federation of Red Cross and Red Crescent Societies, p.159

- It is suggested that OCHA propose inclusion of emergency telecommunications issues in systematic research and studies on various aspects of disaster occurrence and response.
11. The 21st century will be that of integrated **computer and broadband telecommunications**, according to expert opinions. The **Internet** is becoming a world-wide standard, providing multimedia connectivity and compatibility at the protocol level for communications at headquarters level for all partners in humanitarian assistance. Recently, the Secretary General said: "*The Internet [...] makes it possible for us to hold interactive global electronic conferences, which not only save airfares, hotel bills and conference costs, but can as easily and cheaply host 10'000 participants as 10. Within the Secretariat, we can substitute electronic 'meetings' for many face-to-face ones, thereby making far more efficient use of staff time...*"³⁶. However, "[u]p to now, [...] the United Nations has scarcely tapped the potential of the Information Revolution. [...] We need to update and upgrade our internal information technology capacity." As concerns the emergency telecommunications, he added: "*Finally, the Information Revolution has the potential to radically improve the efficiency of our field operations. Wireless communications work even under the worst conditions, including natural disasters and emergencies.*"³⁷
 12. The potential mentioned above, however, needs to be fully recognized and exploited. Multimedia communications stop at the headquarters interconnected via broadband cables or terrestrial microwave links. Current emergency communications with and in the field bases on old narrow-band technologies, created to transmit mainly voice messages over restricted areas only. In 1995, WGET considered the use of Internet in field operations, but found it not fully suitable for operational communications especially in the initial phase of an emergency, when real-time exchange of information is most essential.
 13. The WGET noted that "*limitations for its full utilisation from the field are often set by the limited bandwidth usually available on respective communication links*" which made it impractical and "*cumbersome*". A limited number of access points to the Internet in disaster-prone areas were considered as another obstacle. Now, the situation changed. We see a phenomenal growth of Internet services, and improvement of their quality, accompanied by new developments in radio technology, such as LEO satellite networks, Local Multi-point Distribution Service (LMDS)³⁸ General Packet Radio Service (GPRS), Wireless Application Protocol (WAP), "BlueTooth", High Altitude Platforms (HAP), High

³⁶ We the peoples: the role of the United Nations in the twenty-first century. Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000, item 345

³⁷ We the peoples: the role of the United Nations in the twenty-first century. Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000, item 346

³⁸ Nordbotten A: LMDS Systems and their Applications; IEEE Communications Magazine, June 2000, p. 150-154

Altitude Long Operation networks (HALO)³⁹, 3rd Generation IMT-2000, or “Software Radio”. Even today, a simple email service can offer “*considerable savings*”⁴⁰. The provision of Internet Points-of-Presence (POP) interconnected via satellite terminals⁴¹ is possible. The Internet Protocol could solve difficulties due to **incompatible communication** equipments and protocols that “*hampered inter-agency radio communication*” discussed recently at the IASC meeting^{42 43}. However, to benefit fully from Internet in the field, a broadband wireless network is necessary.

- It is suggested that OCHA adopt Internet Protocol as recommended protocol interfaces for the emergency communications.

³⁹ Colella N et al.: The HALO Network; IEEE Communications Magazine, June 2000, p. 142-148

⁴⁰ Minutes of 2nd WGET Meeting, item 6 (3.2)

⁴¹ Minutes of 2nd WGET Meeting, item 6 (3.2)

⁴² Rushby J, Head Telecoms Unit/ITTS: Memorandum to H Zimmermann, WGET Secretariat, on HF data radio protocol compatibility, 28 June 2000

⁴³ Minutes of the 7th WGET Plenary Meeting, Item 9

9. Further Activities for Consideration

1. Emergency telecommunications should not be considered in isolation. It is a vital part of disaster management, and “*disaster management must be envisaged in a holistic manner, as a continuum from prevention to preparedness, mitigation and response*”⁴⁴. Most nations have built their national disaster mitigation, preparedness, response, and recovery systems separately to satisfy their own needs, and are operating them individually. However, in the age of globalisation, when “everybody depends on everybody else”, the concept of separate systems is becoming out of date. The separate systems need to be united and extended over national borders to cover the whole planet because the impact of disasters can easily extend beyond the borders and exceed the recovery capacity of any single country. The 1986 Chernobyl nuclear explosion has shown that neither political borders, nor the wealth counts, and that disaster can hit rich and poor with no difference. Even the distance does not count when winds disseminate radioactive particles over the continents. Some of the substances released during nuclear accidents in Canada, USA, UK, USSR, East Germany, Russia, and Japan will need hundreds and thousand of years to disappear, triggering various diseases in the meantime⁴⁵. Cooperation and joining resources is thus in the best interest of each member of the human family. Instead of a number of separate national networks, it is much more cost-effective to build/ update/ operate a common world wide network that could satisfy not only the national needs but also the needs of organizations involved in international humanitarian assistance. A common **Global Disaster Relief System** is desperately needed, combining resources available in various countries, and operating as efficiently as fire brigades in Tokyo or Los Angeles, but on the global scale. Our efforts should focus now on building such a system, and on operating it in a rational manner. It would require much efforts and resources to build the necessary legal framework and physical infrastructure.
2. Certainly, humanitarian assistance is possible using any technology. In acute situations, a primitive, low-tech approach may even be more effective than high-tech one. For instance, donkeys were used instead of originally planned helicopters during the 1999 Hindu Kush earthquake⁴⁶, and simple HF radio amateur equipment often works well where sophisticated satellite-based communications fails. However, as the experience gained during the International Decade for Natural Disaster Reduction showed, disaster mitigation is a global problem and global problems require global solutions that only high technology can offer. Telecommunications are crucial here. *“The key issue to emerge is the need for*

⁴⁴ Statement of Ms Carolyn McAskie, Emergency Relief Coordinator; see the Summary Record and Conclusions of the First Meeting of Inter-Agency Task Force for Disaster Reduction, Geneva, 27-28 April 2000

⁴⁵ World Disasters Report 1999, International Federation of Red Cross and Red Crescent Societies, p. 93-96

⁴⁶ World Disasters Report 1999, International Federation of Red Cross and Red Crescent Societies, p. 82

*greater cross-agency disaster preparedness at the field and regional levels. Within this framework, lessons to learn include [...] effective, self-sufficient and compatible communications from field to headquarters*⁴⁷. - such is the conclusion of experts of the International Federation of Red Cross and Red Crescent Societies⁴⁸. In this context, it was not clear to me why the emergency telecommunications have not been included explicitly in the list of eleven priority areas for the future work of the Inter-Agency Task Force for Disaster Reduction⁴⁹. In my opinion, a physical wireless telecommunication infrastructure, accessible 24 hours a day from any place is a necessary element of disaster management on local, national, regional and global scale, deserving the highest priority. It would be a **Global Disaster Relief Communication and Information Infrastructure**⁵⁰, an integral part of an upgraded UN Communications Network, future generations of global systems, and Global Information Infrastructure (GII) heralded at the 1994 development conference in Buenos Aires.

3. Looking at the UN Chart and OCHA's mission statement, it seems natural to expect that OCHA take a lead role in the world in that area. But is OCHA willing and/or capable to undertake that task? The technology is at reach; missing is political will and financial support. The US delegation to the ITU 1995 World Radiocommunication Conference in Geneva proposed an "Internet-in-the Sky", a Low-Earth Orbiting (LEO) broadband satellite system capable to solve most of technical and operational problems hampering today's emergency telecommunications. Impressed by the bold idea, the conference included LEO systems in the Radio Regulations and allocated a frequency band of 500 MHz required for their operation. It was probably for the first time in its long history that this treaty-making body acted so quickly. The reaction was positive: "*Very few people doubt that the LEOs are by far the most important development in disaster telecommunications in the near future. [...] One thing that I know is that if they work as promised, and cost as little to operate as promised, then they could make everything else obsolete overnight!*", wrote Mark Wood⁵¹.

4. Indeed, the new technology offers wireless bandwidth-on-demand high quality services everywhere on the globe, 24 hours a day, at a reasonable price. The capacity allows for transmission of thousands of 1Mb-computer files in a second⁵², carrying data, voice, sound and image. The ability to handle multiple channel rates, protocols and service priorities provides the flexibility to support a wide range of applications including the computer LAN interconnect, Internet and

⁴⁷ Serving all entities involved

⁴⁸ World Disasters Report 1999, International Federation of Red Cross and Red Crescent Societies, p. 76

⁴⁹ Summary Record and Conclusions of the First Meeting of Inter-Agency Task Force for Disaster Reduction, Geneva, 27-28 April 2000, p. 2

⁵⁰ The infrastructure discussed here is of "hardware" type. It should not be mixed with the "Global Disaster Information Network", a body whose proposed functioning resembles that of the existing WGET (see www.gdin-international.org/about_policy.html)

⁵¹ Wood, Mark: Disaster Communications; Disaster Relief Communications Foundation, 1996 (www.reliefweb.int/library/dcl/dccl.html)

⁵² Farserotu J, Prasad R: A survey of Future Broadband Multimedia Satellite Systems, Issues and Trends; IEEE Communications Magazine, June 2000, p. 128-133

corporate intranets, multimedia communication, wireless backhaul, etc. with access speeds thousands times faster than today's standard analogue modems. Although optimised for two-way fixed-site terminals, the new LEO satellite technology is able to serve transportable and mobile terminals in open space, such as those for land-transport, maritime and aviation applications. Except for user terminals (and a few operation-control stations distributed over the planet), some systems may not need any earth-based structure to operate. With appropriate equipment redundancy, they are thus completely insensitive to disasters.

5. New technologies open new vistas. I am convinced that it is only question of time when a LEO satellite global system will satisfy fully the needs of humanitarian assistance community. My vision of possible future global emergency communication infrastructure is as follows. It would consist of two parts interconnected via radio waves. One part would be a global satellite-based "Internet-in-the-Sky" permanently accessible from any place and shared with a number of other applications. Another part would be terrestrial. It would be a set of temporary, dedicated transportable cells (base stations) created ad hoc, following the local needs. In time-critical missions, helicopters could be used to deploy them in the field. They could incorporate GSM, LMDS, and/or HAP base stations interconnecting phones, computers, personal assistants, cameras, sensors, etc., used over the operational field. Such an ad-hoc network would include one or more terminals interconnected to the external world via the satellites, using the today's VSAT-based or new LEO satellite technology.
6. The Federal Emergency Management Agency (FEMA) in the USA has already a fleet of mobile communication centres that combine VSAT terminals and HF/VHF/UHF and CB radio, radio repeaters, LOS microwave links, landline connections, offering teleconferencing, full broadcast television, etc.⁵³ However, in cases where terrain obstacles blocked communications, many of that equipment was of no use.
7. Satellite technology could help in some cases. New developments in signal processing make it possible to better use current capabilities of radio channels. The Annex contains a description of a system of interactive multimedia links from a central point to a number of mobile stations, or among mobile stations, using VSAT satellite terminals and standard personal computers. It was used for the first time in 1999 elections in Ukraine to save time, budget and resources during the election campaign. The candidates sitting at the central TV studio were able to participate in live discussions with thousands of voters hundreds kilometres away across the country. The voice and picture were transmitted with sufficient quality and reliability in both directions (from and to the studio) using channels of limited capacity (25 to 512 Kb/s). The deployment time of such a mobile station was 30 minutes or so.
8. Both, the LEO- and VSAT-based networks can work only when the terminal and the satellite "see" each other. The VSAT terminals communicate with geostationary satellites that are at 36'000 km distance, and can be seen only from a part of earth surface. The LEO satellite constellations are at lower distances of 1'500

⁵³ See www.fema.gov/r-n-r/mers04.htm

km or so, and are visible practically from any point on the earth. Due to smaller distance, a LEO-satellite terminal requires much less power than VSAT terminal to produce equally strong signals at the satellite (only about 0.2%⁵⁴). It means smaller power consumption, size, weight, and cost - vital features of equipment to be used in the field. The same concerns the LEO satellites: they can be smaller, lighter, and less expensive. Also, the cost of putting a satellite on its orbit is lower for a LEO system, because of the shorter distance and smaller mass of satellite. The signal latency is also much smaller in LEO systems than in geostationary ones (~4%), making real-time broadband communications practical.

9. The proposed future global "Internet-in-the-Sky" would assist greatly the disaster relief. It would enable new methods of coordinating the many faces of disaster assessment and response, and better use of limited resources available. Field manager would be able to exchange timely multimedia information with all those involved: medical doctors, specialized experts, databases, simulation programs, etc., from vehicle and from office, 24 hours a day, using his/her standard laptop computer and/or personal assistant. It would enable virtual "tele-presence" and participatory decision-making based on knowledge gathered from wherever in the world it might be located. The equipment used in the field could have build-in authentication mechanism allowing its use by authorized individuals only (e.g. identified by their fingerprints or voices). It would solve the problem of misuse and illegal access to the resources. The computer and telecommunication resources available within such a network would allow an automatic position tracking of persons, vehicles and equipment. The positions could be displayed in the form of graphical symbols on a computer-generated map that could include also other information relevant to the mission. The maps could be analysed in the field and at the headquarters in the same time, easing consultations at distance.
10. The capability of easy and inexpensive transmitting high-resolution maps, satellite photographs, etc. will make practical their use in the field operations. High-resolution (<10m) satellite images and digital model of the earth surface are available via Internet. A global inventory of such material and free access to it would be beneficial. However, a legal question may arise, concerning the use of such material, in view of intellectual property.
 - a. It is suggested that OCHA clarify the issue of intellectual property and initiate work towards elimination of all potential obstacles in making use of such material in humanitarian actions.
11. Automatic generation and processing of distress/ emergency alert signals would be possible, contributing to the safety and security in the field, requested for so long by so many⁵⁵. For that purpose, the field staff at risk could be equipped with a small (vehicle-mounted, wearable, or hand-held) personal terminal with a

⁵⁴ In the light-of-sight propagation model, and with the same antenna gains, the signal intensity ratio equals the distance-ratio squared; $(1500/36000)^2 \sim 1/625$ or 0.16%

⁵⁵ Russler D (Ms), Deputy UN Security Coordinator: Memorandum to All security Focal points on the Report of the Ad Hoc Inter-agency Meeting on Security, dated 21 June 2000

fingerprint-capture device⁵⁶. The terminal would be connected by radio waves with pre-determined individuals. A simple touch of a “red button” on the terminal would generate distress emergency alert signals initiating the rescue process with maximum discretion possible, which is crucial in case of terrorist attacks. The distress signal would carry the geographic position and the fingerprint of calling person. The fingerprint would be compared with the information stored in the personnel database to identify the victim, and his/ her personal data would be extracted from the database. Now, when the victim and his/her current position are known, the rescue operations could start. The necessary information would automatically be distributed among the local manager, the headquarters, the nearest rescue team on duty, family, etc., and each would receive only what he/she needs and is authorized to receive. For instance, health history and previous treatment would be addressed to the medical services only. Alternatively, the system could be programmed to send periodically a test message and wait for answer; if the answer would not come within a predetermined period, the rescue team could be alarmed automatically⁵⁷. Or, the position and path of the field staff member could be continuously tracked and registered automatically in a database. Alert could be generated if he or she moves outside a predetermined tolerance area, and appropriate action could be initiated automatically. Moreover, an integrated miniature camera could discreetly take pictures of persons and things in the environment and transmit them automatically to the headquarters. In the case of terrorist attacks, such film/photographic evidence could facilitate identification of terrorists involved and their possible judgment in the court. A simplified version of that system would consist in attaching a dedicated radio to the equipment of interest, to facilitate fleet management.

12. Because of its permanent presence and universal accessibility, the future system would also play an important role in timely warning and in effective disaster preparedness. Moreover, its enormous transmission capacity would enable rapid post-disaster recovery. Helicopters could deploy terrestrial stations and user's equipment replacing the damaged telecommunication infrastructure by new wireless one (or creating it from zero in regions without telecommunications). Full telecommunication services could be offered to the population in hours or days after the disaster.
13. No such universal global emergency communication/ information infrastructure exists or has been attempted. Its implementation would thus involve development of new hardware and software, and financial investments. However, most of the elements required are available, waiting to be integrated. The US Vice President Al Gore declared: "*... we now have at hand the technological breakthroughs and economic means to bring all the communities of the world together. We now can at least create a planetary information network that transmits messages and images with the speed of light from the largest city to*

⁵⁶ Phillips J et al.: An Introduction to Evaluating Biometric Systems; Computer, February 2000, p. 56-

⁵⁷ Note that it would solve the problem of UHF/ VHF common safety and security frequency channels, mentioned in another section of this report.

the smallest village on every continent."⁵⁸ There are two major broadband LEO systems under development: Teledesic (see Annex) and SpaceBridge (see Annex), both were originally expected to enter into service in the years 2001 – 2002. The first broadband LEO satellite was put on the orbit in 1998 for testing purposes⁵⁹.

14. To exploit fully potential benefits offered by this technology, the specific requirements of humanitarian assistance field staff must be known by the developers before their systems enter into the operational phase. It may cost nothing to include many features of special significance for the field staff at the conception phase. However, adding any new feature at a later stage usually involves very high additional costs, if it is possible at all. Translating the user's requirements into technical specifications of the system is usually the most difficult, time-consuming and error-prone task. Ideally, the future user and system designer should work together from the very beginning.

15. As mentioned, new technologies require investments. But the existing systems cannot continue for long time, and their replacement also requires investments. The Public Safety Wireless Network Program (PSWN) study⁶⁰ indicated that the existing public safety LMR equipment in the USA does not assure inter-agency interoperability and needs to be replaced by new equipment. The replacement costs were estimated for about \$18 billion⁶¹. This estimate does not include operating and maintenance expenses. It also does not account for the additional costs associated with system architecture changes that would help achieve interoperability, spectrum efficiency, or system security. What to say of other countries less developed than the USA? Iridium, launched in 1998, was the first LEO system that offered (narrow band) instant services at any (open) place on the earth, 24 hours a day. It evidenced that the new technology is sound. In spite of that, Iridium did bankrupt. That bankruptcy changed the attitude of financial market, and can change the future of broadband LEO satellite technology. In fact, all projects under development might be cancelled. For instance, Teledesic system would require a \$9 billion investment⁶²; other systems cost similarly. Although emergency telecommunications would use only a small part of the capacity of the system, it would be unrealistic to expect that poor countries would contribute significantly to projects of such dimensions. Rich countries must take the whole burden. To put it in a perspective: \$34 billion⁶³ - about four times the cost of complete LEO satellite network - was collected in a recent (April 2000)

⁵⁸ Vice President Al Gore on the Global Information Infrastructure. Remarks by the Vice President Al Gore to the International Telecommunication Union Development Conference in Buenos Aires, Argentina, 21 March 1994; Global Communications Interactive '97, p. x - xxiv

⁵⁹ Struzak R: Internet in the sky: tests have started... ITU News 6/98, p. 22-26

⁶⁰ Boston Baseline - PSWN Program Symposium Compilation Report August 1997 - December 1999 (available via Internet PSWN home page)

⁶¹ \$15.4 billion in local LMR equipment, \$1.7 billion in state LMR equipment, and \$1.2 billion in federal LMR equipment

⁶² It is about 9% of the total amount of estimated damage due to the disasters in the years 1990-1999, see World Disasters Report 2000, p. 168

⁶³ www.spectrumbauctions.gov.uk/auction/text_sums/websum2e150.html (17/7/2000)

auction of five licences for 3rd generation radio communication services in a single (developed) country. The Apollo project costs were twice as high. It contributed to the morale of a nation and pride of sending the first man to the Moon to put its national flag there. It would take a year and an average contribution of about 3 dollars a month from every US citizen⁶⁴. If only a half of the population of high- and upper-middle-income countries⁶⁵ would be equally generous, enough money could be collected in six months to cover the cost of LEO satellite-based “Internet-in-the-Sky” offering more practical benefits to themselves and - at no extra cost - to the whole humanity. Would they be willing to do so?

16. There are various mechanisms possible to finance the future global disaster relief communication and information infrastructure outlined above. For instance, it might be a profit from the TELECOM expositions organised regularly by ITU, it might be private foundation, it might be regular governmental contributions taken from all taxpayers, it might be a tax imposed on telecommunication operators only, it might be a percent of contributions paid for insurance against disasters, it might be a duty on notification in the international frequency register in ITU. The USA alone may wish to consider creating such a system by their own, to replace its national infrastructure. Then, it may wish offer all UN family an access to it, closing once forever all discussions about the US debts in that organisation. Finally, one can imagine that a portion of income from auctions of licences to use the radio frequencies that are considered by many as “*common heritage of mankind*” is used for that purpose. In view of permanent governmental budget difficulties in almost all countries, involvement of private sector investment is critical for the success of any project of such dimension. However, private investors require secure framework that only political encouragement on the highest level can assure. The UN Secretary General made it clear: “...*the central challenge we face today is to ensure that globalisation becomes a positive force for all the world's people, instead of leaving billions of them behind in squalor. Inclusive globalization must be built on the great enabling force of the market, but market forces alone will not achieve it. It requires a broader effort to create a shared future, based upon our common humanity in all its diversity.*”⁶⁶

17. It is suggested that OCHA initiate work towards building and operating a global emergency communication/ information infrastructure and take proactive attitude towards new emerging satellite technologies. All those potentially interested should be involved, including the World Bank, WorldTel, and the private sector entities. The new LEO systems should include functional and operational requirements specific to humanitarian assistance and enabling compatibility with other systems. The **United Nations** organization has generated high expectations and high disillusion, too. People over the world expect more than a sequence of conferences and promises. They need practical results of UN activities that would make their life easier and safer. They need tangible evidence that the resources they spend to maintain the UN alive are justified. A

⁶⁴ Assuming the US population of 275 million

⁶⁵ The total population of these groups amounts about 1.3 billion people

⁶⁶ We the people: the role of the United Nations in the twenty-first century; Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000, item 14

global emergency communication/ information infrastructure in operation could be such evidence, and OCHA is best placed, in my opinion, to initiate and coordinate UN activities aimed at that goal. Recently, the UN Secretary General has reminded the UN Charter that defines “*devising cooperative solutions to economic, social, cultural and humanitarian problems*”⁶⁷ as one of the main purposes of that organization. He added: “*Ultimately [...] the United Nations exists for, and must serve, the needs and hopes of people everywhere*”⁶⁸; *we must put people at the centre of everything we do*”⁶⁹; *We must do more talk about our future [...] We must start to create it, now.*”⁷⁰. It is high time to start implementing these directives in the field of emergency telecommunications. The global disaster relief communication and information infrastructure proposed above would respond to the needs and expectations of humanity. Being politically neutral, and serving all countries equally, the rich ones and the poor ones, the common infrastructure could find support much easier than other, more controversial UN projects. The new millennium just commencing would be an excellent occasion to initiate it. I was told that my suggestions go beyond the OCHA’s mandate. If it is the case, OCHA should address the problem at an appropriate forum to reach practical results as soon as possible. Fourteen thousand people are affected, and seven are killed by disasters each hour, in average⁷¹. Without any action starting now, the global disaster relief communication and information infrastructure proposed above may not be created within the next fifty years or so. Can we wait so long?

⁶⁷ We the people: the role of the United Nations in the twenty-first century; Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000; item 9

⁶⁸ We the people: the role of the United Nations in the twenty-first century; Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000; item 10

⁶⁹ We the people: the role of the United Nations in the twenty-first century; Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000; item 16

⁷⁰ We the people: the role of the United Nations in the twenty-first century; Report of the Secretary-General, UN General Assembly A/54/2000, 27 March 2000; item 17

⁷¹ World average for the year 1998. Source of data: World Disasters Report 2000, International Federation of Red Cross and Red Crescent Societies, p. 151

Selected comments

Comment 1

From: Hans Zimmermann [Hans.Zimmermann@ties.itu.int]

Sent: Wednesday, August 02, 2000 11:48

To: Ryszard.Struzak@ties.itu.int

Subject: Many thanks !

Dear Ryszard:

Many thanks for the excellent report. We are reproducing it for distribution to all interested parties, and I am sure that it will also be the best possible tool to steer the project through the latest one in a series of re-structurings of OCHA, and hopefully also to mobilize the urgently needed resources. I am therefore particularly grateful to you for having accepted the consultancy on short notice, and for having conducted your in-depth research and compiled such a detailed report exactly on schedule - all this while you were at the same time very busy with the conference in Poland and other major issues. Your report will furthermore serve as an example for the evaluation of other OCHA projects, which are scheduled for the next months.

I have just signed the authorization for the payment of your fee as per the SSA. I shall of course keep you informed about reactions to and results of this evaluation, and I hope to have an opportunity to again work with you in the future.

Again many thanks, and best regards

Hans

Hans Zimmermann,
UNITED NATIONS, Office for the Coordination
of Humanitarian Affairs (OCHA),
Palais des Nations, CH-1211 Geneva 10, Switzerland
Phone +41 22 917-3516, Fax +41 22 917-0208 / -0023
<Hans.Zimmermann@ties.itu.int> <Zimmermann@un.org>

Comment 2

FRED H. CATE

*Professor of Law and Harry T. Ice Faculty Fellow
Director, Information Law and Commerce Institute
Senior Counsel for Information Law,
Ice Miller Legal & Business Advisors*

Indiana University School of Law—Bloomington
211 South Indiana Avenue
Bloomington, Indiana 47405-7001

Telephone (812) 855-1161
Facsimile (812) 855-0555
E-Mail fcate@indiana.edu

February 3, 2001

Via International Post and E-Mail (mountain@un.org)

Mr. Ross Mountain
Director
Office for the Coordination of Humanitarian Affairs—Geneva
United Nations
Palais des Nations
CH-1211 Geneve 10
Switzerland

Dear Mr. Mountain:

I write in response to Ryszard Struzak's report, *Evaluation of the OCHA (DRB) Project on Emergency Telecommunications With and In the Field* (2000), to highlight several of Dr. Struzak's recommendations and to urge the continued and expanded participation of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) in the field of emergency telecommunications.

I have been privileged to work with OCHA and its predecessors, the International Telecommunication Union, and other United Nations agencies in the area of emergency telecommunications for the past ten years. I was a delegate to the original Conference on Disaster Communications in Tampere, Finland (1991); convener of the Roundtable on The Media, Scientific Information and Disasters at the 1994 World Conference on Natural Disaster Reduction in Yokohama; convener of the United Nations Scientific and Technical Committee's 1995 meeting on communications and disaster mitigation in Washington; chair of the drafting committee of the Working Group on Emergency Telecommunications that drafted the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations (Tampere Convention); moderator of the Informal Consultations on the Draft Tampere Convention in Geneva in April 1998; and an expert on behalf of the Government of Finland at the Intergovernmental Conference on Emergency Telecommunications in Tampere, Finland, in June 1998, at which the Tampere Convention was adopted. I am the editor and author of many publications in this field, including *International Disaster Communications: Harnessing the Power of Communications to Avert Disasters and Save Lives*, *Media, Disaster Relief and Images of the Developing World*, and "Communications, Policy Making, and Humanitarian Crises" in *From Massacres to Genocide: The Media, Public Policy, and Hu-*

manitarian Crises. Suffice it to say, I am intimately familiar with the United Nation's important work in the field of emergency telecommunications.

I certainly do not need to tell you of the significant achievement that adoption of the Tampere Convention represents. Not only does it facilitate the rapid deployment of telecommunications to prevent and mitigate disasters and other emergencies—its critical, essential purpose—but is also a remarkable diplomatic and legal achievement: It is the first international legal instrument to extend privileges and immunities to relief workers who are not otherwise diplomats or attending diplomatic conferences. It was the first treaty-like instrument formed by the people it most directly affects—relief organizations and telecommunications equipment and service suppliers—not by government diplomats and lawyers. And it is a model for how governmental and nongovernmental institutions can work together to solve multinational problems. Finally, and perhaps most significantly, it was the beginning of a process of desperately needed intense consultation among international and national agencies, NGOs, scientific and technical organizations, academic institutions, and companies—all focused on facilitating rapid, reliable, and safe deployment of emergency telecommunications infrastructure in the field. The Working Group on Emergency Telecommunications, almost as much as the Tampere Convention itself, is a major practical accomplishment of the past decade's work.

I could not agree more strongly with Dr. Struzak's conclusion that "Without the effort of OCHA and its predecessors, the Convention would not now exist." (p. 11) To be more specific, despite the variety of structural changes that OCHA and its predecessors have endured during the past decade, Hans Zimmerman never lost sight of the importance of creating the Tampere Convention. He was an energetic, reliable force from beginning to end, sometimes using personal funds and leave time to continue to press for the negotiation and adoption of the Convention. He literally traveled the globe, explaining the concept of the Convention to anyone who would listen. The Convention is testimony to his unflagging energy and ubiquitous presence, and all of us who were involved in drafting the Convention recognize the debt that we owe to Hans and to OCHA.

I would also like to highlight Dr. Struzak's conclusion that there is still critical work for OCHA to accomplish. The Tampere Convention itself, with the approval of the relevant United Nations authorities, calls on the OCHA to serve as "operational coordinator" and delegates significant responsibilities in Articles 3, 4, 6, 7, 8, and 9. The partnership forged between OCHA and the International Telecommunication Union, which was so critical in the adoption of the Tampere Convention, is even more important in carrying out the important tasks of the Convention. I urge you to follow the recommendations of Dr. Struzak and ensure that OCHA is directed to fulfill its responsibilities and to enhance that partnership, and that the staff are provided with the resources necessary to do so. It is difficult to imagine a more important role for OCHA than fulfilling its obligations under the Tampere Convention.

Finally, I write to urge your support for Dr. Struzak's recommendation for an expanded role for OCHA in promoting the ratification and use of the Tampere Convention. Let me be clear, the Convention is not an end in itself, but it is a key element in a broader strategy of using telecommunication resources to save and improve lives. Its ratification is critical, therefore, not to preserve the Convention as a legal instrument, but rather to ensure that the systems and infrastructure it creates are in place for that essential purpose. Moreover, the *process* of ratification, like the processing of creating the

Tampere Convention, is certain to improve coordination and focus government and public attention on this critical area. Finally, making a success of the Tampere Convention will heighten its usefulness as a model of an innovative way to address other vexing issues that confront humanitarian relief efforts.

I recognize that you work within a complicated system and limited resources, and I am painfully aware that my own country is in large part responsible for OCHA's financial distress. Nevertheless, the hallmark of OCHA's most important contribution to the Tampere Convention has been the longevity of OCHA's support and the steadfastness of Hans Zimmerman's leadership in the field of emergency telecommunications. I urge you to renew OCHA's commitment to this vital endeavor, and I pledge you my energetic support for your efforts to do so. Thank you.

Yours sincerely,

Fred H. Cate
Professor of Law and
Harry T. Ice Faculty Fellow

cc: Ryszard Struzak (by e-mail—ryszard.struzak@ties.itu.int)

Comment 3

From: Pekka Tarjanne [pekka.tarjanne@pp.inet.fi]

Thursday, April 12, 2001 06:18

Sent: To: Ryszard STRUZAK

Subject: Tampere conference

Dear Ryszard (I should of course say Professor Struzak as I used to),

Thank you very much for your message and congratulations on your good and important work. It is going to be very valuable in the preparations and for the results of the May conference in Tampere.

Please make sure that the organizers as well as the participants, even the potential participants get the information how to access these basic documents. I'm of course willing to assist if needed.

Amities and hope to see you in Tampere,

pekka