

International Telecommunication Union

**ITU-R**  
Radiocommunication Sector of ITU

**Report ITU-R M.2085-1**  
(11/2011)

**Role of the amateur and amateur-satellite  
services in support of disaster  
mitigation and relief**

**M Series**  
**Mobile, radiodetermination, amateur  
and related satellite services**



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Telecommunication  
Union

## Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

## Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Annex 1 of Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

### Series of ITU-R Reports

(Also available online at <http://www.itu.int/publ/R-REP/en>)

Series	Title
<b>BO</b>	Satellite delivery
<b>BR</b>	Recording for production, archival and play-out; film for television
<b>BS</b>	Broadcasting service (sound)
<b>BT</b>	Broadcasting service (television)
<b>F</b>	Fixed service
<b>M</b>	<b>Mobile, radiodetermination, amateur and related satellite services</b>
<b>P</b>	Radiowave propagation
<b>RA</b>	Radio astronomy
<b>RS</b>	Remote sensing systems
<b>S</b>	Fixed-satellite service
<b>SA</b>	Space applications and meteorology
<b>SF</b>	Frequency sharing and coordination between fixed-satellite and fixed service systems
<b>SM</b>	Spectrum management

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## REPORT ITU-R M.2085-1

**Role of the amateur and amateur-satellite services in support of disaster mitigation and relief**

(Question ITU-R 209-3/5)

(2006-2011)

**1 Introduction**

The amateur services have a long history of providing radiocommunications during emergencies and in support of disaster relief. Amateur stations are distributed throughout the world in populated and sparsely populated areas have flexible equipment with frequency agility and have trained radio operators capable of reconfiguring networks to meet the specific needs of an emergency.

Amateur stations are regularly involved in emergency radiocommunications for relief of hurricanes, typhoons and cyclones; tornadoes, floods; fires; volcanic eruptions; and some man-made emergencies such as chemical spills.

**2 Related texts**

The use of the amateur and amateur-satellite services is documented in ITU-R and ITU-D texts, namely:

- Article 5 of the Radio Regulations (RR) lists frequency allocations for the amateur and amateur-satellite service;
- Article 25 establishes basic rules for the amateur and amateur-satellite services. In particular, it states:  
“25.9A § 5A Administrations are encouraged to take the necessary steps to allow amateur stations to prepare for and meet communication needs in support of disaster relief. (WRC 03);”
- Resolution 644 (Rev.WRC-07) – Telecommunications resources for disaster mitigation and relief operations;
- Resolution 646 (WRC-03) – Public protection and disaster relief;
- Recommendation ITU-R M.1042 – Disaster communications in the amateur and amateur-satellite services;
- Recommendation ITU-R M.1732 – Characteristics of systems operating in the amateur and amateur-satellite services for use in sharing studies;
- Recommendation ITU-D 13.1 – Effective utilization of the amateur services in disaster mitigation and relief operations.

The ITU-D Handbook on Emergency Telecommunications (2005), in particular: Part II, Chapter 5 – The Amateur Radio Service – includes the following:

- the roles of the amateur services in emergency telecommunications;
- short-, medium- and long-range networks;
- communications modes;

- operating frequencies;
- repeater stations;
- the organization of amateur radio emergency service;
- third party communications in the amateur radio service;
- optimizing the use of the amateur radio service as a public service.

Part III of the ITU-D Handbook lists frequencies allocated to the amateur and amateur-satellite services as well as those allocated to the mobile service likely to be used for emergency radiocommunications. It includes antenna, propagation and other useful information related to emergency radiocommunications.

The contents of the ITU-D Handbook drew heavily on studies developed in ITU-R and ITU-R contributed to the work of the Handbook editorial team.

The ITU-R Special Supplement, *Emergency and Disaster relief*, lists studies carried out by Radiocommunication Study Groups and annexes related texts.

### 3 GAREC

Since the first Global Amateur Radio Emergency Communications (GAREC) Conference took place on 13-14 June 2005 in Tampere, Finland, six more GAREC conferences have been held (Finland 2006, USA 2007, Germany 2008, Japan 2009, Netherlands Antilles 2010 and South Africa 2011). These conferences review the possibilities to further improve contributions of the amateur services and serve as an advisory group on emergency communications to the IARU. Furthermore, GAREC conferences promote the implementation of the goals defined by the World Summit on the Information Society, including:

- the existing structures and agreements of cooperation between national amateur radio organizations and institutional providers of emergency and disaster response services;
- the role of the amateur services in national and international humanitarian assistance and in disaster prevention and preparedness;
- the role of the amateur services in capacity building and in improving affordable connectivity;
- the need for a supportive regulatory framework as part of an enabling environment to improve access to communication.

The conclusions of the GAREC conferences confirm that:

- The amateur services have proven capabilities and capacities to serve the international community through their global network of infrastructure-independent stations. Such stations are not only most likely to withstand the physical impact of disasters, but their flexibility furthermore avoids the overload all public networks inevitably experience in the aftermath of disasters. The broad spectrum of technologies used by the amateur services allows the joint use of traditional media and new technologies.
- Beyond its character as a global network, the amateur services are an invaluable resource of skilled operators, trained and experienced in maintaining communications under the most adverse conditions. It is thus essential to ensure that this resource can be fully utilized in the service of emergency and disaster response providers.

As a result of GAREC-2005, the International Amateur Radio Union Administrative Council established a working group to develop an International Emergency Communication Handbook for the Amateur Radio Service.

#### **4 Emergency centre of activity frequencies**

The emergency centre of activity frequencies proposed by GAREC-2005 have been adopted by the conferences of all three regional entities (R1, R2, R3) of IARU. The frequencies reflect specific regional requirements such as band allocations and the respective IARU band plans.

Emergency radio frequencies in the VHF and UHF bands vary by country.

It should be noted that amateur radio equipment is tuneable rather than set to specific channels. Thus, the above centres of activity are nominal frequencies on or near which a number of networks can be supported as needed.

#### **5 Recent operational experiences**

The following paragraphs outline specific experience gained during some of the catastrophic events that have affected public and private communication networks since 2006 including those of the institutional providers of emergency assistance and disaster relief

##### **5.1 Interoperability with other services**

The amateur radio services provide, by definition, primarily point-to-point communication between stations operating within these services. To the extent applicable regulations allow third-party communications, such communications can serve the providers of disaster relief and the public.

To an increasing degree, the utility of amateur radio service communication links is greatly enhanced by connections with public communication networks. Stations of the amateur service networks located within an affected area can provide links to stations of these services located in locations not affected by a disruption of public or private networks of other services, which in turn relay traffic from and to any location worldwide. The characteristics of amateur radio stations typically deployed in emergency situations do not normally allow full duplex and broadband communications required, for example, for Internet services such as web-browsing, but they ensure the exchange of messages through e-mail and on conventional telephone networks. The amateur radio services also maintain their own networks on the Internet.

##### **5.2 Support to other services**

Operators of the amateur radio services have in many cases assisted in the re-establishment of disrupted public and private services. Their skills, to use what is available, and their flexibility in respect to communication modes and procedures have been a valuable asset in such cases.

##### **5.3 International assistance**

The availability of the amateur radio services in times of disaster depends first of all on the number of stations normally operating in the affected region. The density of stations differ; not only because of differences in population density, but also as a result of different regulatory provisions established by national administrations. When a disaster strikes in a country or region with a low number of local amateur radio stations, international assistance is required. Such assistance has been possible in some cases in the past, but it depends on respective agreements between administrations. International recognition of amateur radio licences has existed in some regions for many years, for example, within CEPT and those administrations which have joined the relevant CEPT agreements. Like all humanitarian assistance, communication support has become an increasingly international element of disaster relief. The development of a scheme for international recognition of national amateur licences is therefore considered by the amateur service to be a high priority

**6 Preparedness measures**

Several countries have established preparedness measures including training courses, and have held major exercises, often in close cooperation with the disaster response organizations and institutions they serve. Such partners included national and international partners from government as well as non-governmental sectors. Joint exercises, during which amateur radio operators actively support the communication requirements of institutional providers of emergency response, are indispensable for an efficient use of the valuable resources that skilled operators with experience in establishing communications with often very limited means and under difficult circumstances can provide.

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