REPORT ITU-R M.2085*

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

(2006)

Scope

This Report is intended to document the role of the amateur and amateur-satellite services in provision of radiocommunications in support of disaster mitigation and relief. It includes information developed after the South-East Asia tsunami in December 2004.

1   Introduction

The amateur services have a long history of providing radiocommunications during emergencies and in support of disaster relief. Some important attributes of the amateur services are that 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

Much concerning 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-2000) – Telecommunications resources for disaster mitigation and relief operations;

–   Resolution 646 (WRC-2003) – Public protection and disaster relief;

–   Recommendation ITU-R M.1042 – Disaster communications in the amateur and amateur-satellite services;

–   Recommendation ITU-R M.1732 documents the technical and operational characteristics of systems used in the amateur service and amateur-satellite services;

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*   This Report should be brought to the attention of Telecommunication Standardization Study Group 2.

–   Recommendation ITU-D 13 – 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 service 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

The first Global Amateur Radio Emergency Communications Conference took place on 13-14 June 2005 in Tampere, Finland. The conference reviewed the possibilities to further improve the contributions the amateur service can make to 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 service in national and international humanitarian assistance and in disaster prevention and preparedness;

–   the role of the amateur service 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.

Among the conclusions of the 2005 conference were that:

–   The amateur service has proven capabilities and capacities to serve the international community through its 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 service allows the joint use of traditional media and new technologies.

–   Beyond its character as a global network, the amateur service is 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.

The second Global Amateur Radio Emergency Communications Conference was held on 19-20 June 2006 in Tampere, Finland in parallel with the International Conference on Emergency Communications (ICEC-2006), which reviewed the status of implementation and application of the Tampere Convention on the Provision of Telecommunications for Disaster Mitigation and Relief Operations (ICET-98, in force since 8 January 2005).

4   Emergency centre of activity frequencies

International Amateur Radio Union Region 1 organization (IARU R1) General Conference 2005 adopted the frequencies 21 360 kHz, 18 160 kHz and 14 300 kHz and recommended their adoption by IARU Regions 2 and 3 by their next competent conferences in 2006 and 2007 respectively. Region 3 did so at its conference in Bangalore, India in August 2006. In addition, IARU Region 1 adopted the frequencies 7 060 kHz and 3 760 kHz as centres of activity for that Region.

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

It should be noted that amateur radio equipment is frequency agile within certain bands and typically is continuously tunable 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

5.1   Tsunami in South-East Asia in December 2004

Amateur radio organizations and individual amateurs in several of the countries affected by the 26 December 2004 earthquake and subsequent tsunamis in South-East Asia began emergency radiocommunications activities. On that date, a special amateur radio operation known as a "DXpedition" was underway in Port Blair on Andaman Island when the earthquake struck. The operation was quickly shifted to emergency mode.

Within 30 minutes of the quake that triggered the tsunami, the station had one transceiver outside with a mobile whip antenna, powered by the hotel generator, and was taking health-and-welfare messages from the people there. Many people wanted to tell relatives on the Indian mainland that they were safe. The station in Port Blair made radio contact with several amateur stations in India and Thailand.

Another amateur station was established on Car Nicobar Island, one of the worst-hit areas that had been totally cut off from communications. Amateurs from Australia, Hong Kong, Indonesia, Israel, Sri Lanka, Malaysia, Singapore and Thailand made contact with the Indian amateur emergency net and extended their fullest cooperation.

Many amateur stations on the Indian mainland participated in an emergency net on 7 MHz. Indian amateurs established stations in Tamil Nadu, the hardest hit area on the mainland. Amateurs handled health-and-welfare, emergency and medical messages.

Thai amateurs relayed information between affected areas along the west coast in the south to government agencies. An amateur radio-internet interconnection system known as EchoLink

enabled amateurs in Thailand to relay information to friends and relatives of those who had been on vacation in the stricken areas.

During the emergency, there was uncertainty whether it was permissible for amateur stations to transmit messages internationally on behalf of third parties. Fortunately, Article 25 of the Radio Regulations as revised at WRC-03 made it possible to transmit such messages between countries which do not object to such transmissions.

In an effort to lend any assistance possible to the earthquake/tsunami disaster, a low-Earth orbit amateur satellite known as AMSAT OSCAR 51 was reconfigured as a store-and-forward packet radio "bulletin board" for those in the disaster area.

Amateur stations provided emergency communications to government and relief organizations during the tsunami and its aftermath. At some locations, amateur radio was the only communications available for several days until regular telephone and data communications was restored.

5.2   Hurricane Katrina in the United States in 2005

Katrina was the most extensive of three hurricanes that affected the southern United States during 2005, the other two being Wilma and Rita.

Katrina devastated coastal areas of the states of Louisiana, Mississippi and Alabama. Soon after Katrina's landfall, about 250 amateur radio operators responded on an unprecedented scale. Amateur radio was uniquely suited by virtue of the availability of HF communications covering long distances without fixed infrastructure. Amateur stations used a variety of operating modes including voice, packet radio and Morse telegraphy.

Throughout the emergency, approximately 1 000 amateur radio operators provided emergency communications for 250 shelters and kitchens operated by non-governmental relief agencies, principally in Alabama, northern Florida and Mississippi. At airports in Texas and Alabama, radio amateurs tracked evacuees and notified the Baton Rouge operations centre of their whereabouts so their families would be able to find them. Amateur radio operators in New Orleans participated in locating stranded persons because local cell phone calls could not be made by stranded victims due to inoperative wireline infrastructure. Emergency ("911") call centres could not handle calls from relatives calling in from outside the affected area, so they passed those health-and-welfare inquiries to amateur operators stationed at those call centres. Amateurs also relayed information of stranded persons to the centres. Amateur stations provided links between Coast Guard helicopters and emergency centres because ambulance crews could not contact the helicopters directly.

The amateur radio industry helped by making significant contributions of equipment and supplies, including HF and VHF transceivers, power supplies, batteries and antenna systems. The equipment was transported to areas where amateur equipment was damaged or destroyed or where more permanent installations were required.

6   Preparedness measures

Several countries have established preparedness measures including training courses, held major exercises and concluded agreements between amateur radio organizations and national and international disaster response institutions including government and non-governmental organizations.

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