

RESOLUTION 34 (Rev. Baku, 2025)

Role of telecommunications/information and communication technologies in disaster preparedness, early warning, rescue, mitigation, relief and response

The World Telecommunication Development Conference (Baku, 2025),

recalling

- a)* Resolution 136 (Rev. Bucharest, 2022) of the Plenipotentiary Conference, on use of telecommunications/information and communication technologies (ICTs) for humanitarian assistance and for monitoring and management in emergency and disaster situations, including health-related emergencies, for early warning, prevention, mitigation and relief;
- b)* Resolution 182 (Rev. Bucharest, 2022) of the Plenipotentiary Conference, on role of telecommunications/ICTs in regard to climate change and the protection of the environment;
- c)* Resolution 646 (Rev.WRC-19) of the World Radiocommunication Conference (WRC), on public protection and disaster relief (PPDR);
- d)* Resolution 647 (Rev.WRC-19) of WRC, on radiocommunication aspects, including spectrum-management guidelines, for early warning, disaster prediction, detection, mitigation and relief operations relating to emergencies and disasters;
- e)* Resolution ITU-R 55-4 (Rev. Dubai, 2023) of the Radiocommunication Assembly, on ITU Radiocommunication Sector (ITU-R) studies of disaster prediction, detection, mitigation and relief;
- f)* Article 5 of the International Telecommunication Regulations, on safety of life and priority of telecommunications;
- g)* Article 40 of the ITU Constitution, on priority of telecommunications concerning safety of life;

- h) Article 46 of the Constitution, on distress calls and messages;
- i) that § 5.1 of the International Telecommunication Regulations stipulates that safety-of-life telecommunications, such as distress telecommunications, have absolute priority, where technically practicable, and in accordance with the relevant articles of the Constitution and the ITU Convention and taking due account of the relevant Recommendations of the ITU Telecommunication Standardization Sector (ITU-T), in particular Recommendation ITU-T E.161.1, on guidelines to select the emergency number for public telecommunication networks;
- j) emergency telecommunication/ICT coordination mechanisms established by the United Nations Office for the Coordination of Humanitarian Affairs;
- k) Recommendation ITU-T X.1303*bis* on the common alerting protocol (CAP), version 1.2,

recognizing

- a) that there is a growing general awareness at the global level of the potentially serious negative consequences of climate change, especially if global emissions are not cut in accordance with relevant agreements;
- b) that the number of disasters caused by natural and human-induced hazards, as well as the tragic consequences associated therewith, is steadily increasing;
- c) that existing, new and emerging telecommunication/ICT services and technologies are crucial to disaster preparedness, early warning, messaging, rescue, mitigation, relief and response and also constitute a decision tool for rescue services and entities involved, as well as for communication with and among citizens;

d) that such disasters can damage not only telecommunication/ICT infrastructures but also electricity supplies that power telecommunication/ICT systems and devices, thereby making services inoperable, such that considerations of redundancy and resilience of both infrastructure and power supply become important when planning for disasters;

e) that frequent tragic events in the world and the experience of the Telecommunication Development Bureau (BDT) and the ITU Member States in this area clearly demonstrate the need for enhanced disaster preparedness, and for plans that incorporate consideration of resilient communications equipment and services, as well as reliable telecommunication infrastructure, in order to ensure public safety, to assist disaster-relief agencies in mitigating risk to human life, to provide the necessary general public information to ensure that preparation, rescue, mitigation and response can be undertaken in an efficient and timely manner, accurately and free of charge, including in local languages and for the benefit of Indigenous Peoples, and to meet communication needs in such situations;

f) that the concept of scientific monitoring and reliable telecommunication (SMART) cables includes scientific sensors mounted in the repeaters of submarine cables to measure ocean-bottom temperature, pressure and seismic acceleration,

considering

a) that the Intergovernmental Conference on Emergency Telecommunications (Tampere, 1998) (ICET-98) adopted the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations and that this convention came into force in January 2005;

b) that the CAP Workshop held during the third Global Forum on Emergency Telecommunications (Mauritius, 2019) (GET-19) highlighted the benefits of CAP, and shared best practices and lessons learned on how to create an enabling environment for leveraging CAP;

- c)* that the disaster connectivity map launched at GET-19 is a mapping platform to help first responders determine the status of telecommunication network infrastructure, coverage and performance before and after a disaster;
- d)* that the second Conference on Disaster Communications (Tampere, 2001) (CDC-01) invited ITU to study the use of public mobile networks for early warning and the dissemination of emergency information and the operational aspects of emergency telecommunications such as call prioritization;
- e)* that ITU leads on pillar 3 of the United Nations Early Warnings for All (EW4All) initiative (Warning dissemination and communication) in support of achieving target (g) of the Sendai Framework on Disaster Risk Reduction;
- f)* that Resolution 646 (Rev.WRC-19) addresses the broader category of PPDR, as well as the harmonization of frequency bands/ranges for PPDR solutions, and resolves to encourage administrations to satisfy temporary needs for frequencies in emergency and disaster-relief situations, in addition to those normally made available by agreement with the administrations concerned, and to facilitate cross-border circulation of radiocommunication equipment intended for use in emergency and disaster-relief situations through mutual cooperation and consultation without hindering national legislation;
- g)* that Resolution 646 (Rev.WRC-19) likewise resolves to encourage administrations to consider Recommendation ITU-R M.2015, and to use agreed frequency bands for PPDR to the maximum extent possible when undertaking their national planning for their PPDR applications, particularly broadband, in order to achieve harmonization;

h) that Resolution 646 (Rev.WRC-19) further encourages administrations to consider also parts of the regionally harmonized frequency ranges for their PPDR applications;

i) that Resolution 647 (Rev.WRC-19) resolves that ITU-R continue, through its study groups, to study those aspects of radiocommunications/ICTs that are relevant to early warning, disaster prediction, detection, mitigation and relief operations, taking into account Resolution ITU-R 55-4 (Rev. Dubai, 2023);

j) that Resolution 647 (Rev.WRC-19) instructs the Director of the Radiocommunication Bureau (BR) to continue assisting Member States with their emergency communication preparedness activities by maintaining a database of information from administrations for use in emergency situations, which includes contact information and optionally includes available frequencies for use in emergency situations, reiterating the importance of having spectrum available in the very early stages of humanitarian assistance intervention for disaster relief;

k) that Resolution 647 (Rev.WRC-19) likewise invites the Director of the Telecommunication Standardization Bureau and the Director of BDT to collaborate closely with the Director of BR to ensure that a consistent and coherent approach is adopted in the development of strategies in response to emergency and disaster situations;

l) the work of the ITU-R and ITU-T study groups in adopting Recommendations that have helped to provide technical information on satellite and terrestrial radiocommunication systems and wired networks and their role in disaster management, including important Recommendations pertaining to the use of satellite networks in times of disasters;

- m)* the work of the ITU-T study groups in developing and adopting Recommendations for priority/preferential emergency telecommunications and emergency telecommunication services, including consideration of use of both terrestrial and wireless telecommunication systems during emergencies;
- n)* that modern telecommunications/ICTs are basic tools for disaster preparedness, mitigation and relief;
- o)* that mobile and personal communication systems are beneficial for responding to disasters, and should therefore also be used before a disaster to ensure information can be shared with those who need it most;
- p)* outcomes and activities of the ITU Global Forum on Emergency Telecommunications;
- q)* the importance of utilizing both existing and new technologies and solutions (satellite and terrestrial) to satisfy a range of interoperability requirements and for furthering the goals of PPDR, including through innovative SMART submarine cables;
- r)* that high-altitude solutions, when applied to telecommunications/ICTs, have the potential to enable the rapid restoration of communications in emergency and disaster situations;
- s)* the terrible disasters from which many countries suffer, and the disproportionate impact of disasters and of climate change on developing countries¹;

¹ These include the least developed countries, small island developing states, landlocked developing countries and countries with economies in transition.

- t) the particular vulnerability of the least developed countries (LDCs), landlocked developing countries (LLDCs) and small island developing states (SIDS), including those facing significant coastal or other environmental hazard exposure, to the impact that disasters can have on their economies and infrastructures, and that these countries often lack the capacity to respond to disasters;
- u) the need to take into account the requirements of persons with disabilities and persons with specific needs with respect to disaster warning, response planning and recovery efforts;
- v) ITU's collaborative initiatives with the International Maritime Organization (IMO) to develop emergency maritime telecommunications/ICTs;
- w) the findings of the ITU Telecommunication Development Sector (ITU-D) Smart Seas project, which highlight that many SIDS and coastal countries remain underserved in terms of access to telecommunications/ICTs, despite their high vulnerability to disasters at sea;
- x) that the capability and flexibility of all telecommunication/ICT facilities depend upon appropriate planning for the continuity of each phase of network development and implementation;
- y) the opportunity to significantly facilitate all phases of disaster operations offered by national emergency communication plans that enable the pre-positioning, rapid deployment and effective utilization of telecommunication/ICT equipment;
- z) the potential of including the use of telecommunication/ICT tools in infrastructure development planning to avert the risk of disasters and mitigate their effects;

aa) the need for international and regional cooperation among States, as well as between organizations, on preparedness, early warning, rescue, mitigation, relief and response, including through the establishment of a network of experts in disaster management;

ab) that existing, new and emerging telecommunication/ICT services and technologies offer enormous potential to support assessment, early warning, mitigation and response, and that some technologies enable the transmission of messages to users on a massive scale and in real time, particularly in affected areas;

ac) the role of the private sector, governments and international and non-governmental organizations in providing telecommunication/ICT equipment and services, expertise and capacity-building assistance to support disaster-relief and recovery activities, particularly through the ITU Framework for International Cooperation in Emergencies (IFCE);

ad) that a disaster, when it occurs, may extend beyond the borders of a State, and its management may involve the deployment of efforts by more than one country in order to prevent loss of human life and regional economic crisis;

ae) that coordination between international, regional and national organizations specializing in disaster management and administrations increases the probability of saving human life when rescue operations are conducted, and thereby mitigates the consequences of a disaster, such that collaborative work and networking among disaster-management experts is thus essential;

af) that the use of telecommunications/ICTs for sharing of information in the event of a disaster is a powerful decision-making tool for rescue services and operating entities, and for communication with and between citizens;

ag) ITU's collaborative initiatives with United Nations and other expert bodies to work on disaster resilient telecommunications/ICTs, including: the SMART Cables Joint Task Force with the World Meteorological Organization (WMO), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and its Intergovernmental Oceanographic Commission; the AI Subgroup of the EW4All initiative with the United Nations Office for Disaster Risk Reduction, WMO, and the International Federation of Red Cross and Red Crescent Societies; the Global Initiative on Resilience to Natural Hazards through AI Solutions with UNESCO, the United Nations Environment Programme, the United Nations Framework Convention on Climate Change, the Universal Postal Union and WMO; and the Global Maritime Distress and Safety System with IMO, under the auspices of the International Convention for the Safety of Life at Sea (SOLAS)²;

ah) the need to investigate the use of submarine telecommunication cables for ocean and climate monitoring and disaster warning;

ai) that oceanographic sensors on undersea telecommunication cables constitute a promising solution for obtaining the extensive, longitudinal, real-time data that are critical for understanding and managing urgent environmental issues such as climate change and tsunami hazard mitigation;

aj) the United Nations Secretary-General's Roadmap for digital cooperation, which highlights the importance of accelerating discussions on connectivity as part of emergency preparedness, response and aid,

² In 2012, the Food and Agriculture Organization of the United Nations, the International Labour Organization and IMO published Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels, containing voluntary recommendations for vessels not covered by the SOLAS Convention.

noting

- a) the continued pursuit by ITU and other relevant organizations of joint activities being undertaken at the international, regional and national levels to establish internationally agreed means to operate systems for PPDR on a harmonized and coordinated basis, and the successful role of BDT through its programme activities in this area;
- b) the successful role of BDT, in partnership with the ITU membership, and in coordination with the Emergency Telecommunications Cluster (ETC), with respect to rapid intervention in enabling and facilitating telecommunications/ICTs for countries which have suffered disasters;
- c) that all phases of disaster operations can be greatly facilitated by national emergency telecommunication plans that enable the pre-positioning, rapid deployment and effective utilization of ICT equipment;
- d) that including the use of telecommunication/ICT tools in infrastructure development planning can avert the risk of disasters and mitigate their effects,

noting further

- a) the latest version of the ITU-D Handbook on emergency telecommunications (2014), the Compendium of ITU's work on emergency telecommunications (2007), the ITU Handbook on best practice on emergency telecommunications (2008), and the adoption of Recommendation ITU-D 13.1, on effective utilization of the amateur radio services in disaster-mitigation and relief operations, as well as the reports on disruptive technologies and their use in disaster risk reduction and management and to protect the environment and tackle climate change;

- b) that further guidance for ITU members on disaster-communication management is provided by previous successful conclusions and outputs of ITU-D Study Group 2 (before 2022), including the Guidelines for conducting national-level ICT drills and exercises, the Handbook on outside plants for areas frequently exposed to disasters caused by natural hazards, and also by outputs of ITU-D Study Group 1, in particular under Question 3/1 (2022–2025), including the Guidelines for early warning systems and disaster drills;
- c) the results of work done by ITU-R Study Groups 4, 5, 6 and 7 on the use of different radiocommunication systems in emergency situations, and in particular Recommendations ITU-R S.1001, ITU-R M.1637, ITU-R BS.2107 and ITU-R RS.1859;
- d) that the ITU regional offices can be particularly helpful prior to and following emergencies, owing to their proximity to affected countries,

resolves to instruct the Director of the Telecommunication Development Bureau

1 to continue to ensure that priority consideration is given to emergency communications and disaster management³ as an element of telecommunication/ICT development, including continued close coordination and collaboration with ITU-R and ITU-T and relevant international organizations, and that coordination with BR must take into consideration the outcomes of studies, especially those which provide for harmonized models for PPDR networks;

2 within budgetary resources, to periodically organize forums and workshops on emergency communications and disaster management that provide administrations with best practices for mechanisms, procedures and coordination that can be used in emergency and disaster situations;

³ In this resolution, "disaster management" covers disaster preparedness, early warning, rescue, mitigation, relief and response.

3 to establish contact points at the level of BDT and the ITU regional offices, enabling affected Member States to request capacity building and direct assistance in terms of emergency communications and disaster management, whereby the contact numbers of these points are to be circulated to ITU members and contact points are to be responsible for coordinating ITU assistance to disaster-struck countries and with relevant United Nations and international organizations that coordinate and/or provide emergency communications;

4 to facilitate and encourage the use by Member States of telecommunications/ICTs that are appropriate and commonly available for early warning, disaster response, mitigation and relief operations, including those provided by amateur radio, satellite and terrestrial services, as well as undersea sensing technologies;

5 to promote, in close collaboration with ITU-R and ITU-T, the implementation of early-warning systems, and emergency information broadcasting, for example audio and TV broadcasting, mobile messages including cell broadcasting, etc., and the use of CAP, taking into account persons with disabilities and persons with specific needs, and ensuring the ability to reach isolated populations, especially those at sea or in underserved and unserved geographical areas;

6 to support administrations in their work towards the implementation of this resolution as well as ratification and implementation of the Tampere Convention;

7 to report to the next world telecommunication development conference on the status of ratification and implementation of the Tampere Convention;

8 to support administrations and regulators in the areas identified in this resolution by taking appropriate measures during the implementation of the ITU-D action plan;

9 to continue to support administrations in preparing their national disaster response and relief plans, including consideration of the necessary enabling national regulatory and policy environments to support the development and effective use of telecommunications/ICTs for disaster mitigation, relief and response;

10 to strengthen the role of the ITU regional offices, in coordination with the above-mentioned points of contact, in assisting Member States and Sector Members in developing emergency preparedness plans, national emergency telecommunication plans and early-warning systems, in organizing training workshops on emergency relief and response, in providing equipment training, in fostering collaboration with all parties involved and in helping deploy communication equipment during emergencies;

11 as part of the IFCE, to continue providing assistance to administrations, in coordination with the above-mentioned points of contact, within available resources, and in collaboration with the ITU membership and other partners, through the temporary supply of emergency communication/ICT equipment and services, especially during the initial phases of disasters;

12 to assist administrations in the use of telecommunication networks, including mobile networks, for the timely dissemination of alert messages and warnings in situations of risk or emergency, for those in potentially affected areas;

13 to assist Member States in enhancing and strengthening the use of all available radiocommunication services in emergency situations when conventional sources of electricity supply or telecommunications are often interrupted;

14 to expedite the study of aspects of telecommunications/ICTs related to flexibility and continuity in the event of disasters, as part of national disaster plans, including promoting the use of broadband networks for emergency communications through the work of the ITU-D study groups, in collaboration with expert organizations, taking account of the activities of the other ITU Sectors and relevant United Nations and other international organizations;

15 to work collaboratively in efforts under the ITU-D study Questions, as well as with the other two Sectors, ITU regional offices, the ITU membership and other relevant expert organizations, in implementing this resolution, and to report regularly on programme activities and relevant regional initiatives to the study groups;

16 to include, in the ITU Academy's training plans, programmes on the use of telecommunications/ICTs for disaster management and mitigation;

17 to promote the implementation of decisions of the ITU Global Forum on Emergency Telecommunications, within existing budgetary resources;

18 to strengthen the ability of Member States to make digital infrastructure more resilient to disasters, including those caused by climate change, and to promote more effective communication and response efforts;

19 to continue to give high priority to studies/investigations related to frontier technologies and disruptive technologies, including oceanographic sensors on undersea telecommunication cables, in order to help Member States assess, mitigate and adapt to climate change, as well as to their use in disaster risk reduction and management;

20 to support the ITU study groups in examining the benefits of undersea sensing technologies and in studying the technical, financial, legal and regulatory issues, including the standardization and specification of sensors and cables undertaken in ITU-T that could foster their adoption, in particular in relation to near-to-far field tsunami and earthquake early warning and seismic monitoring;

21 to provide technical assistance and capacity-building support to Member States, particularly developing countries, in integrating new and emerging telecommunication/ICT services and technologies into national emergency telecommunication plans and existing systems to improve their capacity to deliver resilient backup connectivity, analysis, forecasting, messaging, response and monitoring, for all disasters;

22 to continue discussions with financial donors, United Nations pooled funds, etc., with a view to mobilizing funds and additional resources to help developing countries, including LDCs, LLDCs and SIDS, and enhancing efforts to ensure the timely deployment of emergency telecommunication equipment, including assistance to other disaster-prone or geographically vulnerable countries in accessing mobile emergency kits;

23 to continue and enhance efforts to support the timely deployment of emergency telecommunication equipment, including assistance to developing countries and other disaster-prone or geographically vulnerable countries in accessing emergency equipment and services;

24 to continue collaboration with relevant stakeholders in order to increase ITU members' awareness and knowledge of undersea sensing technologies;

25 to help ensure at-risk populations receive alerts and other communications – even when terrestrial networks are impaired by disasters – by leveraging ITU's work on EW4All and working closely with governments, mobile network providers, the satellite industry and local communities to deliver multi-channel communication and ensure that resilient connectivity for telecommunication/ICT infrastructure is in place so that alerting, including satellite-based alerting, via cell broadcast and SMS, complements existing methods and infrastructure in order to guarantee durability and wide reach;

26 to leverage artificial intelligence (AI) for EW4All to support capacity building for telecommunication/ICT-related AI, including by establishing public-private partnerships,

requests the Secretary-General

to continue to work closely with the office of the United Nations Emergency Relief Coordinator, ETC and other relevant external organizations with a view to further increasing the Union's involvement in, and support of, emergency communications and early-warning systems, and to report on outcomes of related international conferences, relief activities and meetings so that the Plenipotentiary Conference may take any action that it deems necessary,

invites Member States

1 to continue to deploy all necessary efforts to integrate disaster risk reduction, disaster mitigation, disaster relief and resilience into telecommunication/ICT development plans;

2 to collaborate with all stakeholders to ensure the use of telecommunications/ICTs in national disaster-management plans to address the specific needs of populations with particular challenges, on land and at sea, during all disaster phases, including persons with disabilities, children, older persons, displaced persons and illiterate persons;

3 to prioritize the collaborative development of national emergency telecommunication plans which consider both land and maritime hazards, in partnership with national stakeholders, including operators, disaster-management agencies and rescue coordination centres;

4 to leverage AI in new and emerging telecommunications/ICTs to improve monitoring, messaging, analysis and forecasting for all disasters;

5 to develop preparedness and disaster recovery and to assist businesses in creating plans that provide a resilient environment for essential government information systems;

6 to consider appropriate and effective mechanisms to facilitate disaster-communication preparedness and response efforts, including for developing countries, especially SIDS and other coastal countries;

7 to facilitate, to the extent practicable, cross-border circulation of radiocommunication equipment intended for use in emergency situations, rescue and relief operations and disaster-relief situations, through mutual cooperation and consultation, without prejudice to national legislation, in accordance with Resolution 646 (Rev.WRC-19);

8 to encourage authorized operating companies to inform all users, including roaming users, in good time and free of charge, of the contact details of the emergency services and other information relevant to emergency response;

9 to develop disaster-management plans that include a multi-channel approach to communication so that different methods of disseminating alert messages, particularly those methods that use telecommunications/ICTs, such as satellite alerts, cell broadcasts and SMS, complement each other to ensure that warnings reach the widest possible audience in good time, as noted in the EW4All Executive Action Plan 2023–2027;

10 to consider introducing, in addition to their existing national emergency numbers, a harmonized national/regional number for access to emergency services, taking into account the relevant ITU-T Recommendations;

11 to foster the training and updating of knowledge of the actors involved in the implementation, maintenance and updating of the telecommunication/ICT systems intended to be used in situations of emergency;

12 to coordinate on a regional basis, with the help of ITU bodies and regional and international specialized organizations, in order to draw up regional response plans in the event of a disaster;

13 to develop partnerships, in order to reduce barriers to access to relevant data obtained through the use of telecommunications/ICTs required for the purpose of assisting rescue operations;

14 to promote Geographic Information System-based mapping of telecommunication/ICT infrastructure and connectivity in disaster-prone areas for better-informed decision-making, with a view to enhancing preparedness, response and recovery efforts, while minimizing damage and loss of life, in accordance with their national policies,

invites also

1 Member States and Sector Members to work together on the study of emerging technologies, standards and related technical issues for improving radio broadcasting systems for sending and receiving information concerning public warning, rescue, disaster mitigation and relief;

2 Sector Members to make the necessary efforts to enable the operation of telecommunication/ICT services in emergency or disaster situations, giving priority, in all cases, to telecommunications/ICTs concerning safety of life in the affected areas and providing contingency plans for such purpose;

3 BDT to consider how relevant telecommunications/ICTs, including space-based technologies, submarine telecommunication cable networks and associated sensor technologies, can be used to help ITU Member States collect and disseminate data on the effects of climate change and support early warning, having regard to the link between climate change and natural hazards;

4 ITU-D to take account of the particular telecommunication/ICT requirements of LDCs, LLDCs, SIDS and low-lying coastal countries in terms of disaster preparedness, rescue, relief and recovery, with an emphasis on populations facing particular challenges, including those at sea;

- 5 ITU-D, within its studies on the role of telecommunications/ICTs in disaster preparedness, early warning, rescue, mitigation, relief and response, to take account of the work of other ITU Sectors and dedicated working groups, considering the increased use of mobile and portable communication devices which can be used by first responders to transmit and receive critical information;
- 6 the United Nations Emergency Relief Coordinator, the Working Group on Emergency Telecommunications and other relevant external organizations or bodies to ensure follow-up and continue collaborating with ITU, specifically BDT, in working towards implementing this resolution and the Tampere Convention, and supporting administrations and international and regional telecommunication/ICT organizations in the implementation of that Convention;
- 7 Member States and Sector Members to provide training programmes for network operators, emergency responders and community volunteers, and to promote cross-border disaster information dissemination for seamless coordination, faster information sharing and better preparedness;
- 8 Member States to take into account ongoing efforts to integrate submarine cable connectivity and resilience into their national disaster-detection and preparedness strategies, and to continue engaging with and supporting such efforts in coordination with relevant expert bodies.