

**Multi-stakeholder Forum on the Role of
Telecommunications/ICT in Disaster Management**

(Bogota, Colombia 24-26 July 2012)

**ITU-T Activities on Disaster Relief
Related to Telecommunications**

Bruce Gracie

**Chairman, Telecommunication
Standardization Advisory Group
(TSAG)**



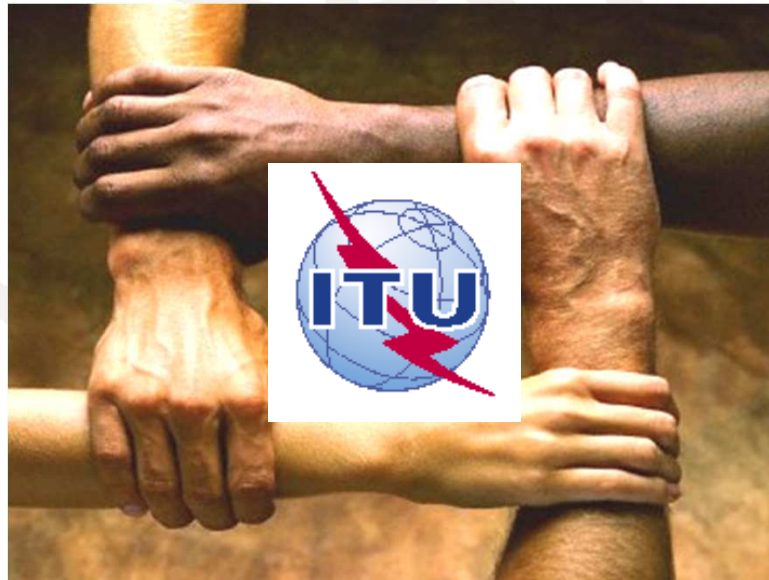
ITU consists of three sectors and General Secretariat

ITU-T

develops ICT standards

ITU-R

manages radio
spectrum and
satellite orbits



ITU-D

promotes ICT
development

General Secretariat
coordinates work of ITU

ITU-T Study Groups (SGs)

- SG2: Operational aspects of service provision and telecommunications management
- SG3: Tariff and accounting principles including related telecommunication economic and policy issues
- SG5: Environment and climate change
- SG9: Television and sound transmission and integrated broadband cable networks
- SG11: Signalling requirements, protocols and test specifications
- SG12: Performance, QoS and QoE
- SG13: Future networks including mobile and NGN
- SG15: Optical transport networks and access network infrastructures
- SG16: Multimedia coding, systems and applications
- SG17: Security
- TSAG: Telecommunication Standardization Advisory Group

Disaster!



Bogota, Colombia 24-26 July 2012

Disaster relief by ITU

- Huge number of people are affected under disaster
- All sectors of ITU are working to contribute to disaster relief from the telecommunication/ICT aspects ... to make a **big difference**
- Disaster relief activities include preparation for possible disasters, early detection, rescue, evacuation assistance, safety confirmation, recovery assistance, etc.
- ITU-T SG2: Lead study group on telecommunication for disaster relief/early warning

ITU-T SG2: Numbers for disaster relief

- Country code **888** for OCHA
 - E.164 country code 888 was assigned to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA)
 - 888 is used by terminals involved in disaster relief activities in an area of a country that has been cut off from the national telecommunications system
- Recommendation ITU-T E.161.1 “Guidelines to select Emergency Number for public telecommunications networks”
 - Recommends use of 112 / 911
- Recommendation ITU-T E.123 “Notation for national and international telephone numbers, e-mail addresses and Web addresses: Contact information in case of emergency for mobile telephones” Amendment 1 – Emergency contact number notation

ITU-T SG2: Emergency Telecommunications Service (ETS)

- National service providing priority use of network resources to achieve a higher probability of end-to-end communication and use of applications, to ETS authorized users in times of disaster and emergencies
- Recommendation ITU-T E.107 “Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS”
- Recommendation ITU-T M.3350 “TMN service management requirements for information interchange across the TMN X-interface to support provisioning of Emergency Telecommunication Service (ETS)”

International Emergency Preference Scheme (IEPS)

- ITU-T SG2: Recommendation ITU-T E.106 “International Emergency Preference Scheme (IEPS) for disaster relief operations”
- ITU-T SG11: Supplement 53 to ITU-T Q-Series Recommendations “Signalling requirements to support the International Emergency Preferential Scheme (IEPS)”

ITU-T SG17: Common Alerting Protocol

- Recommendation ITU-T X.1303 “Common Alerting Protocol (CAP V1.1)”
 - General format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks.
 - Capabilities:
 - flexible geographic targeting using latitude/longitude shapes and other geospatial representations in three dimensions;
 - multilingual and multi-audience messaging;
 - phased and delayed effective times and expirations;
 - enhanced message update and cancellation features;
 - template support for framing complete and effective warning messages;
 - compatible with digital encryption and signature capability; and
 - facility for digital images and audio.
 - XML and compact binary encodings.

Other work within ITU-T

- ITU-T SG2: Requirements for Land Mobile Alerting Broadcast Capabilities for Civic Purposes
- ITU-T SG5: Guidance on ways to improve resilience of networks in case of disaster situations
- ITU-T SG13: emergency telecommunications in NGN
- ITU-T SG15: network resiliency and recovery.
- ITU-T SG16: Support of emergency alerts by IPTV and digital signage.
- ITU-T SG16: Accessibility to information in emergency situations for persons with disabilities.

CTO meeting – Oct. 2011

- The CTO Group meeting requested ITU-T to study disaster relief systems for individuals and for guidance urgently.
- Recent events have underscored the need for standards in such areas.
- ITU-T had already been working on disaster relief in various aspects.
- However, it was identified that there are some **missing and critical** items

Missing and critical items

- The items below were identified
 - Disaster relief for **individuals** (to notify the damage situation from victims to their relatives, friends, or employers)
 - Disaster relief **guidance** (to show victims the routes to evacuation shelters, home, etc.).
 - Network **resilience and recovery** capability of infrastructure to cope better with disasters
- A Focus Group was created to tackle the missing and critical issues

FG on disaster relief systems, network resilience and recovery (FG-DR&NRR)

- Established in January 2012
- Scope
 - Disaster relief systems and/or applications from a telecommunication/ICT perspective
 - Improved network resilience and recovery capability which could better cope with a disaster
- Avoid duplication with other organizations
 - Collaborate among ITU-T Study Groups, in particular SG2, SG5, SG11, SG13, SG15, SG16 and SG17; ITU-R, ITU-D and relevant organizations (inside and outside of ITU) and communities, including the PCP-TDR
- For more details, please visit <http://www.itu.int/en/ITU-T/focusgroups/dnrnr/Pages/default.aspx>

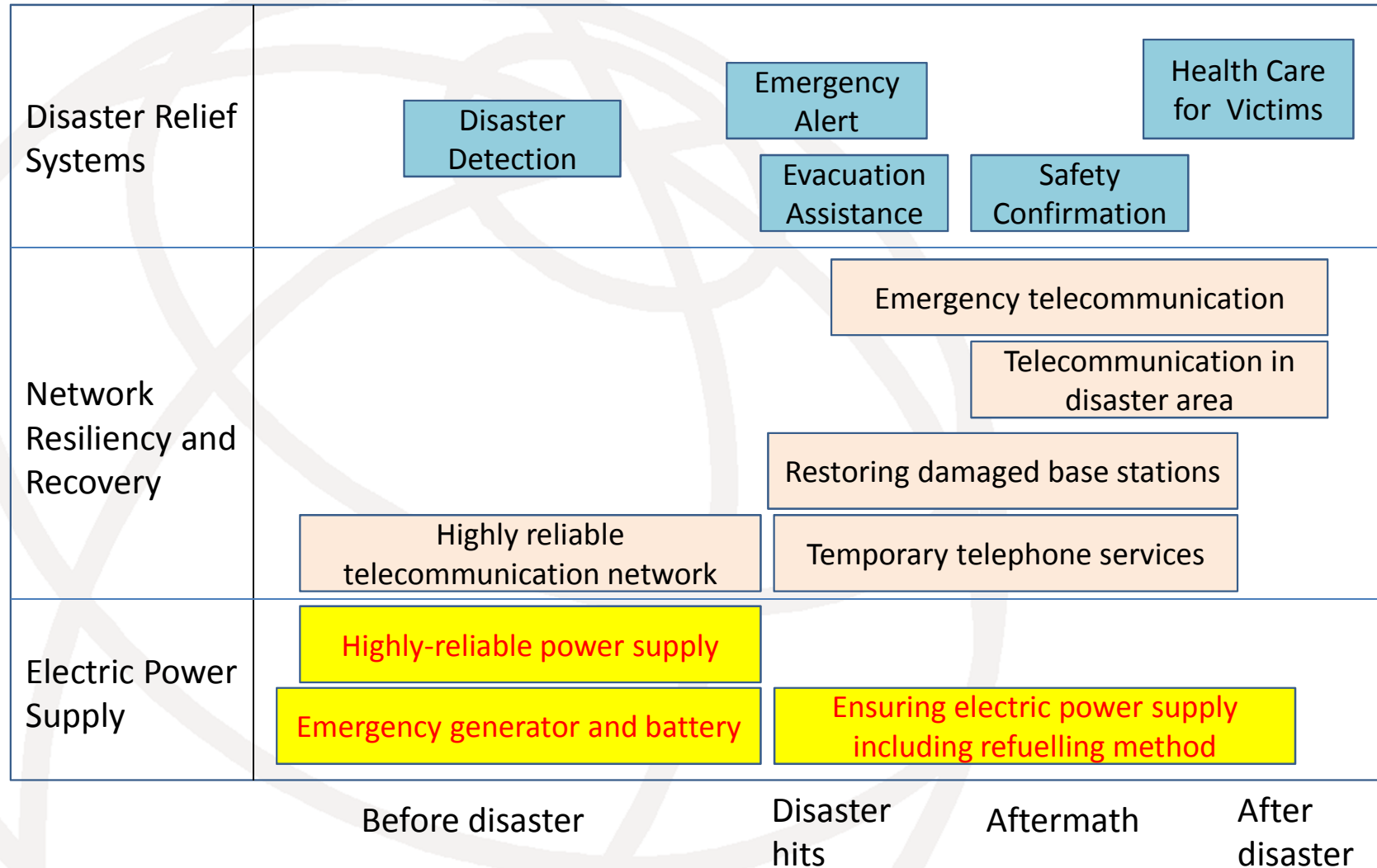
FG-DR&NRR – first meeting (1)

- First meeting: 25-27 June 2012 in Geneva
- Started with a workshop on disaster relief
 - Comprehensive tutorial
 - Sharing experience from East Japan Earthquake in March 2011
 - Current activities in ITU-T, ITU-D and ITU-R
- Made a good start of the discussion and enhanced collaboration and coordination
- Presentations are available at:
www.itu.int/en/ITU-T/Workshops-and-Seminars/dnrnr/201206/Pages/programme.aspx

FG-DR&NRR – first meeting (2)

- Three Working Groups (WGs) were set up:
 - WG1: Use cases and disaster classification
 - WG2: Requirements for network resilience and recovery
 - WG3: Disaster relief systems
- Five deliverables were planned:
 - Overview
 - Definitions, terminology and classification
 - Use cases
 - Gap analysis
 - Requirement documents for disaster relief and network resilience and recovery

Initial overview of the FG's work



Future meetings

- 2nd: 24-26 September 2012, Geneva Switzerland
- 3rd: December 2012 – February 2013, outside Geneva (under planning)
- 4th: February - March 2013, outside Geneva (under planning)
- 5th: June 2013, outside Geneva (under planning)
- Intention is to have meetings in countries which have **disaster experiences** and willingness to contribute

Thank you!



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BACKUP

ITU-T Focus Groups (FG)

- Mechanism within ITU-T for:
 - Quick development of specifications in chosen areas
 - Addressing industry needs
- For collecting expertise from inside and outside of the membership:
 - Participation is **open for non-members**
 - Invite relevant experts as necessary

FG-DR&NRR management

Title	Name
Chairman	Mr Noriyuki Araki (NTT, Japan)
Vice Chairman	Mr Takashi Egawa (NEC, Japan)
Vice Chairman	Mr Leo Lehmann (Switzerland)
Vice Chairman	Mr Ramesh K. Siddhartha (India)
TSB Secretariat	Mr Hiroshi Ota
TSB Assistant	Ms Emmanuelle Labare



Damaged situations from East Japan Earthquake in March 2011

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General (1)



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General (2)



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General (3)



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Telecommunication (1)



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Telecommunication (2)



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Telecommunication (3)

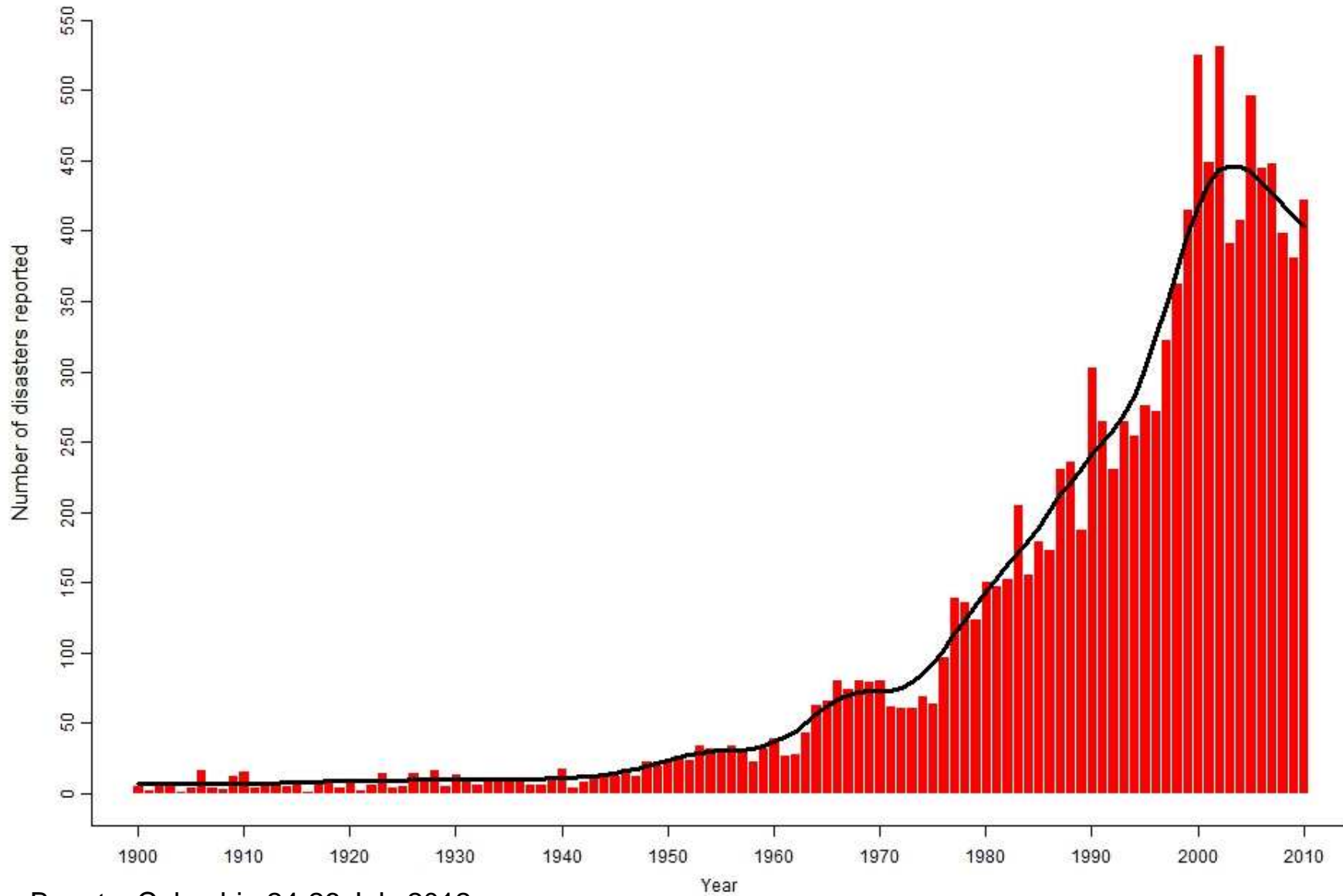


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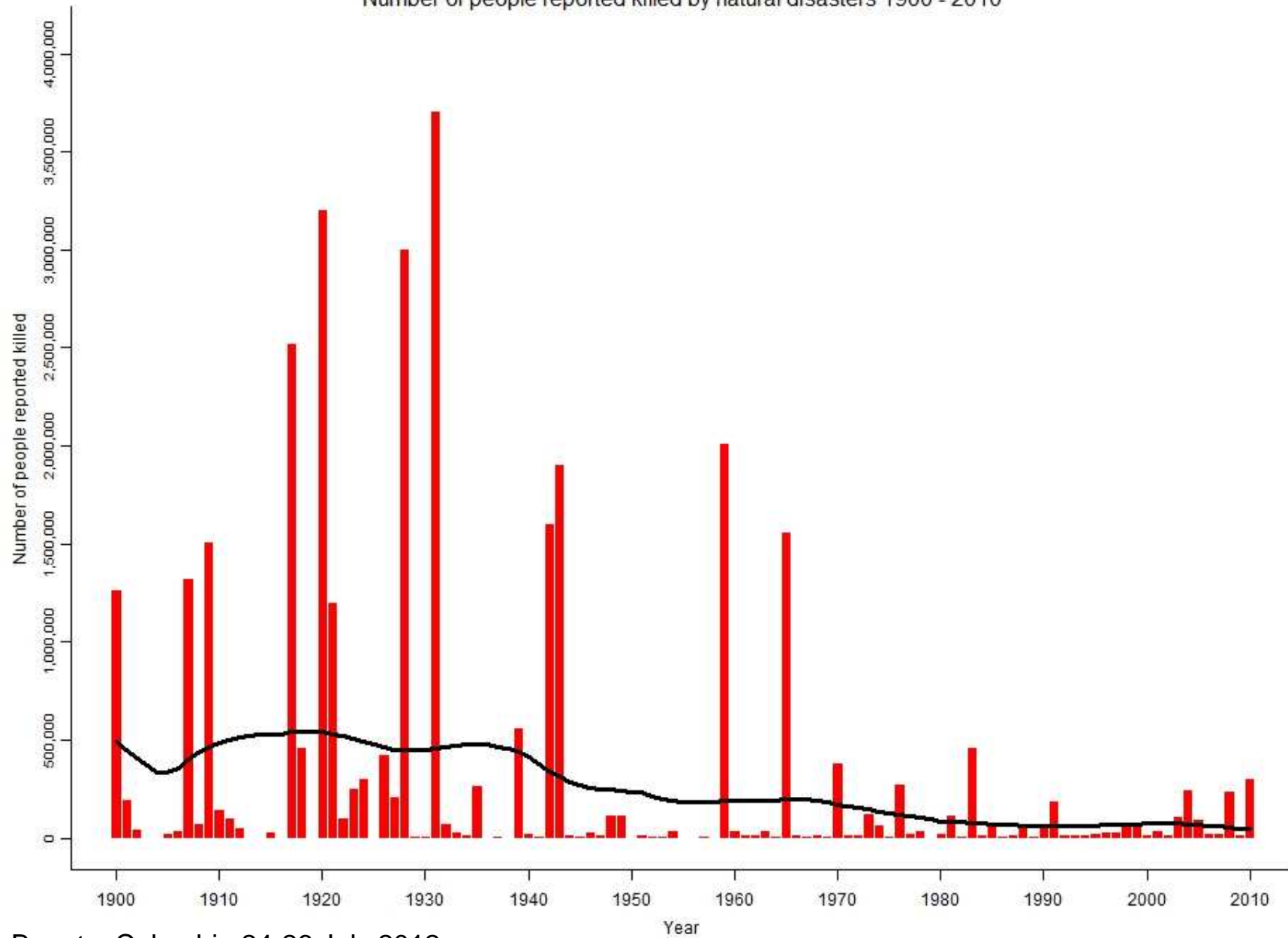
Trends in Natural Disasters

Natural disasters reported 1900 - 2010



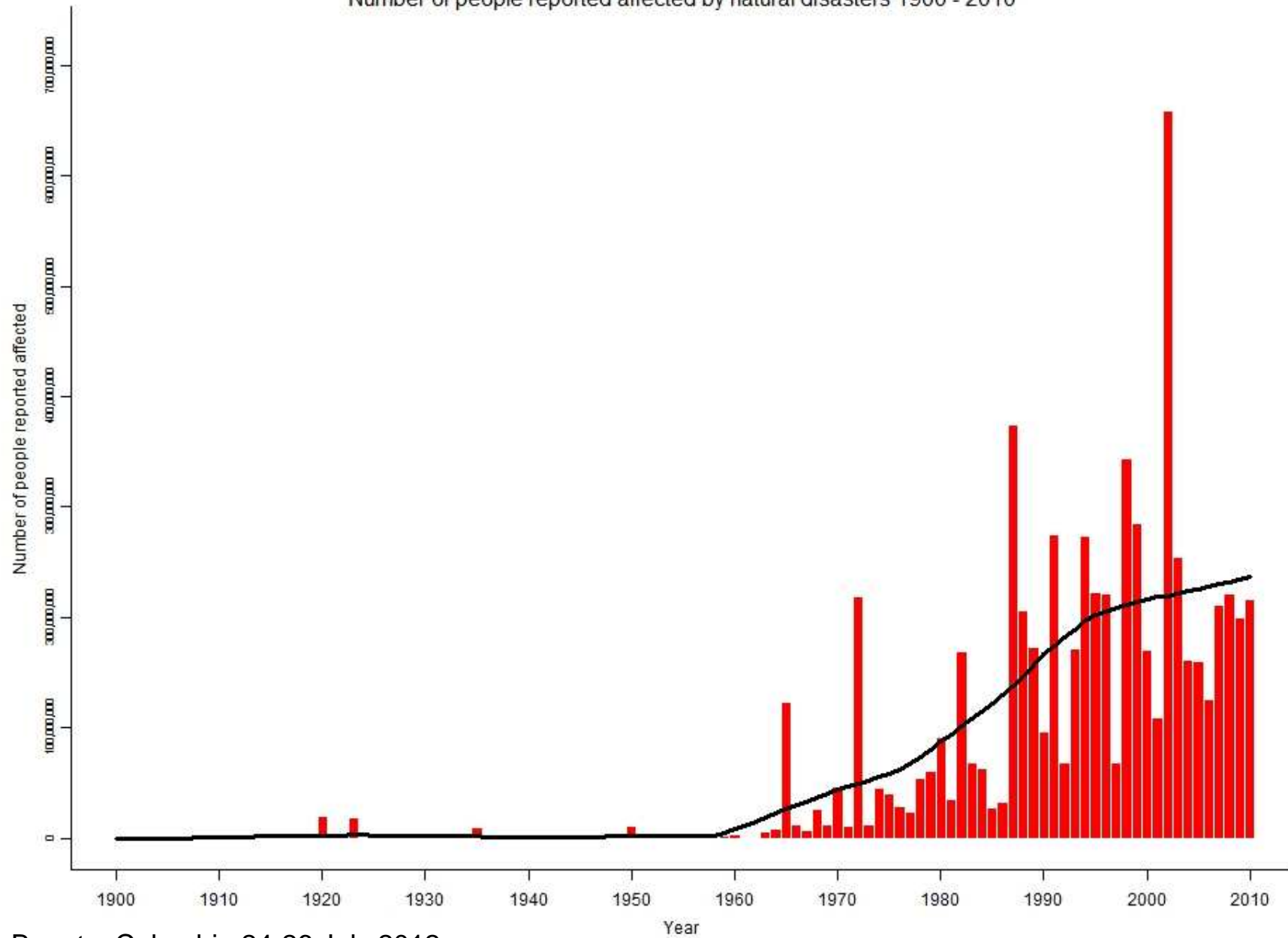
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Number of people reported killed by natural disasters 1900 - 2010



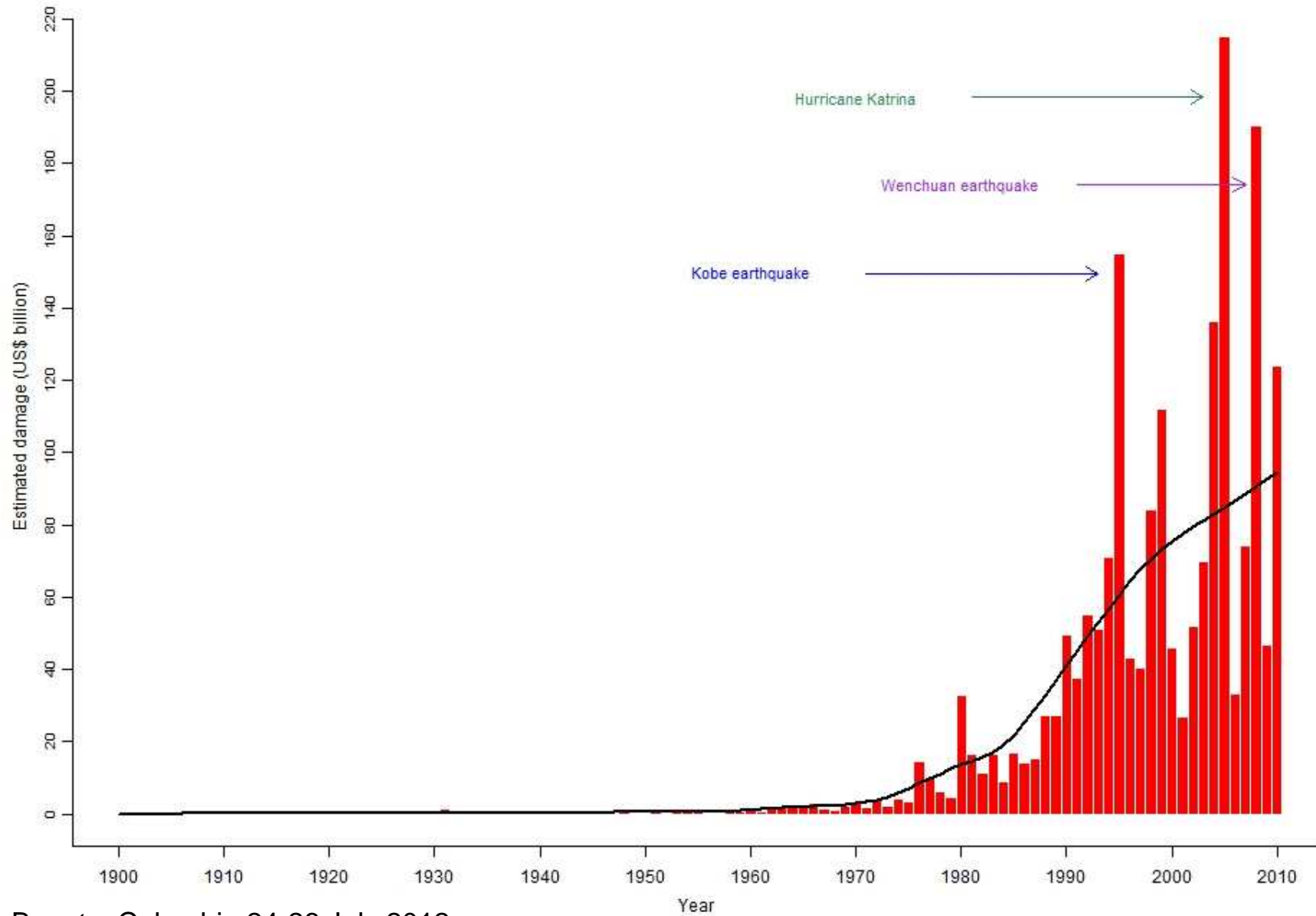
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Number of people reported affected by natural disasters 1900 - 2010



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Estimated damage (US\$ billion) caused by reported natural disasters 1900 - 2010



Bogota, Colombia 24-26 July 2012



ITU-R Recommendations

ITU-R

- Radiocommunication services are important for disaster prediction, detection, alerting and relief. In certain cases, when the "wired" telecommunication infrastructure is significantly or completely destroyed by a disaster, only radiocommunication services can be employed for disaster relief operation.
- <http://www.itu.int/ITU-R/index.asp?category=information&rlink=emergency&lang=en>

ITU-R Recommendations (1)

- ITU-R Recommendation BO/BT.1774 “Use of satellite and terrestrial broadcast infrastructures for public warning, disaster mitigation and relief”
- ITU-R Recommendation F.1105 “Fixed wireless systems for disaster mitigation and relief operations”
- ITU-R Recommendation M.632 “Transmission characteristics of a satellite position-indicating radio beacon (satellite EPIRB) system operating through geostationary satellites in the 1.6 GHz band”
- ITU-R Recommendation M.633 “Transmission characteristics of a satellite emergency position-indicating radio beacon (satellite EPIRB) system operating through a satellite system in the 406 MHz band”
- ITU-R Recommendation M.690 “Technical characteristics of emergency position-indicating radio beacons (EPIRBs) operating on the carrier frequencies of 121.5 MHz and 243 MHz”
- ITU-R Recommendation M.693 “Technical characteristics of VHF emergency position-indicating radio beacons using digital selective calling (DSC VHF EPIRB)”

ITU-R Recommendations (2)

- ITU-R Recommendation M.1042 “Disaster communications in the amateur and amateur-satellite services”
- ITU-R Recommendation M.1637 “Global cross-border circulation of radiocommunication equipment in emergency and disaster relief situations”
- ITU-R Recommendation M.1826 “Harmonized frequency channel plan for broadband public protection and disaster relief operations at 4 940-4 990 MHz in Regions 2 and 3”
- ITU-R Recommendation M.1854 “Use of mobile-satellite service in disaster response and relief”
- ITU-R Recommendation M.2009 “Radio interface standards for use by public protection and disaster relief operations in some parts of the UHF band in accordance with Resolution 646 (WRC-03)”
- ITU-R Recommendation M.2015 “Frequency arrangements for public protection and disaster relief radiocommunication systems in UHF bands in accordance with Resolution 646 (Rev.WRC-12)”

ITU-R Recommendations (3)

- ITU-R Recommendation RS.1859 “Use of remote sensing systems for data collection to be used in the event of natural disasters and similar emergencies”
- ITU-R Recommendation S.1001 “Use of systems in the fixed-satellite service in the event of natural disasters and similar emergencies for warning and relief operations”
- ITU-R Recommendation SA.1863 “Radiocommunications used for emergency in manned space flight”



ITU-D Activities

ITU-D activities

- <http://www.itu.int/ITU-D/emergencytelecoms/index.html>
- Q.22-1/2 Utilization of telecommunications / ICTs for disaster preparedness, mitigation and response
- Guidelines on the use of the Common Alerting Protocol (Report of 2006 – 2010 study period Q.22/2 - Utilization of ICT for disaster management, resources, and active and passive space-based sensing systems as they apply to disaster and emergency relief situations)



ITU-T Recommendations

Signalling for IEPS support

- **ISDN User Part (ISUP)**
 - ▶ Q.761 Amendment 3, Q.762 Amendment 3, Q.763 Amendment 4, Q.764 Amendment 4 and Q.767 Amendment 1
- **Bearer Independent Call Control (BICC)**
 - ▶ Q.1902.1 Amendment 2, Q.1902.2 Amendment 3, Q.1902.3 Amendment 3 and Q.1902.4 Amendment 3
- **Call Bearer Control (CBC)**
 - ▶ Q.1950 Amendment 1 Annex G
- **ATM Adaptation Layer type 2 (AAL2) signalling protocol**
 - ▶ Q.2630.3 Amendment 1
- **Broadband ISUP (B-ISUP)**
 - ▶ Q.2762 Amendment 1, Q.2763 Amendment 1 and Q.2764 Amendment 1
- **Digital Signalling System No.2 (DSS2)**
 - ▶ Q.2931 Amendment 5

IEPS call marking

- ISUP & BICC
 - Calling party's category - IEPS call marking for preferential call set up
 - IEPS call information - country/international network of call origination and “priority level
- CBC, DSS2, AAL2
 - IEPS indicator

ETS in H.323 systems

- Recommendation ITU-T H.460.4 “Call priority designation and country/international network of call origination identification for H.323 priority calls”
 - call priority parameter and country/international network of call origination parameter are transported in the H.225.0 RAS, H.225.0 Call Signalling (Q.931), Annex G/H.225.0, and H.501 messages
 - Priority values: 0–emergencyAuthorised, 1–emergencyPublic. 2-High. 3-Normal
- Recommendation ITU-T H.246 “Interworking of H-series multimedia terminals with H-series multimedia terminals and voice/voiceband terminals on GSTN, ISDN and PLMN” Amendment 1 “Mapping of user priority level and country/international network of call origination between H.225 and ISUP”
 - mapping of the Call Priority Designation and Country/International Network of Call Origination Identification between a packet network and a switched circuit network via a Gateway.

Other H.323 features

- Recommendation ITU-T H.460.14 “Support for Multi-Level Precedence and Preemption (MLPP) within H.323 Systems”
- Recommendation ITU-T H.460.21 “Message broadcast for H.323 systems”
 - Internet multicast procedures

ETS in H.248

- Recommendation ITU-T H.248.1 v3 “Gateway Control Protocol version 3”
 - Emergency call indicator
 - Individual-to-authority communication
 - IEPS call indicator
 - Priority indicator
- Supplement 9 to ITU-T H-Series Recommendations “Gateway Control Protocol: Operation of H.248 with H.225.0, SIP, and ISUP in Support of Emergency Telecommunications Service (ETS) / International Emergency”
 - Mapping of H.248.1 IEPS call indicator and Priority indicator with H.225, SIP and ISUP parameters related to IEPS
- Recommendation ITU-T H.248.44 “Gateway control protocol: Multi-Level Precedence and Pre-emption Package”

ETS in IPCablecom

- Recommendation ITU-T J.260 “Requirements for preferential telecommunications over IPCablecom networks”
- Recommendation ITU-T J.261 “Framework for implementing preferential telecommunications in IPCablecom and IPCablecom2 networks”
- Recommendation ITU-T J.262 “Specifications for authentication in preferential telecommunications over IPCablecom2 networks”
 - PIN + SIP authentication procedures
- Recommendation ITU-T J.263 “Specification for priority in preferential telecommunications over IPCablecom2 networks”
 - Resource-Priority and Accept-Resource-Priority headers (IETF RFC 4412) signal the priority in SIP request and response messages
 - COPS interfaces used to perform resource management and admission control. GateSpec object specifies a session class ID with subfields to set priority and enable preemption

ETS in Next Generation Networks

- Recommendation ITU-T Y.1271 “Framework(s) on network requirements and capabilities to support emergency communications over evolving circuit-switched and packet-switched networks”
- Recommendation ITU-T Y.2205 “Next Generation Networks - Emergency Telecommunications – Technical Considerations”
- Recommendation ITU-T Y.2171 “Admission control priority levels in Next Generation Networks”
 - ▶ 3 levels: from 1 – ETS to 3 – Lowest
- Recommendation ITU-T Y.2172 “Service restoration priority levels in Next Generation Networks”

NGN signalling protocols to support ETS

- Supplement 57 to ITU-T Q-Series Recommendations “Signalling Requirements to support the Emergency Telecommunication Service (ETS) in IP Networks”
 - ▶ SIP, H.248 and Diameter interfaces identified
- Supplement 61 to ITU-T Q-Series Recommendations “Evaluation of signaling protocols to support ITU-T Y.2171 admission control priority levels”

[ITU-T Y.2171] priority level/category	SIP header values	[ITU-T H.248.1] values	Diameter AVP values
Level 1	RPH = 0, 1, 2, 3, 4	Indicator levels 15-11	Reservation-Priority AVP levels 15-11 Priority-Level AVP levels 1-7 Session-Priority AVP levels 0-4
Level 2	No RPH present	Indicator levels 10-1	Reservation-Priority AVP levels 10-1 Priority-Level AVP levels 8-13 No Session-Priority AVP present
Level 3	No RPH present	Indicator level 0	Reservation-Priority AVP level 0 Priority-Level AVP level 14 No Session-Priority AVP present

Emergency services for IMT-2000 networks

- Supplement 47 to ITU-T Q-Series Recommendations “Emergency services for IMT-2000 networks – Requirements for harmonization and convergence”
 - ▶ Emergency calls & IEPS

ITU-T & other SDOs

- Supplement 62 to ITU-T Q-Series Recommendations “Overview of the work of standards development organizations and other organizations on emergency telecommunications service”
 - ITU-T
 - 3GPP
 - 3GPP2
 - ATIS
 - Broadband Forum
 - ETSI
 - IEEE
 - IETF
 - TIA
 - TM Forum
 - WiMAX Forum

Common Alerting Protocol

- Recommendation ITU-T X.1303 “Common Alerting Protocol (CAP V1.1)”
 - General format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks.
 - Capabilities:
 - flexible geographic targeting using latitude/longitude shapes and other geospatial representations in three dimensions;
 - multilingual and multi-audience messaging;
 - phased and delayed effective times and expirations;
 - enhanced message update and cancellation features;
 - template support for framing complete and effective warning messages;
 - compatible with digital encryption and signature capability; and
 - facility for digital images and audio.
 - XML and compact binary encodings.

Alerting object identifier

- Recommendation ITU-T X.674 “Procedures for the registration of arcs under the Alerting object identifier arc”
 - enables identification of different kinds of alert and alerting agencies;
 - specifies the information and justification to be provided when requesting an OID for alerting purposes; and
 - the procedures for the operation of the Registration Authority.
- Example: World Meteorological Organization
 - {joint-iso-itu-t(2) alerting(49) wmo(0)}
 - For weather alerts and weather alerting agencies
 - Used with Common Alerting Protocol

ITU-T Recommendations under preparation

- Draft new Recommendation ITU-T E.ABC “Requirements for land mobile alerting broadcast capabilities for civic purposes”
- Draft new Recommendation ITU-T E.TDR “Framework for the implementation of Telecommunications for Disaster Relief (TDR)”
- Draft new Recommendation ITU-T H.323 Annex M5 for the transport of ITU-T X.1303 common alerting protocol (CAP 1.1) messages