National Emergency Telecommunication Plans

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Outline

1. National emergency telecommunication plans
2. Legislation and regulation
3. International treaties
4. Early warning & emergency alert systems

1 National emergency telecommunication plans

National Emergency Telecommunication Plans

- Four phases of disaster risk management
- What is a NETP?
- Why it is important
- Drafting the NETP
  - NETP Principles
  - Topics to be included in the NETP
  - Challenges

Phases of Disaster Management

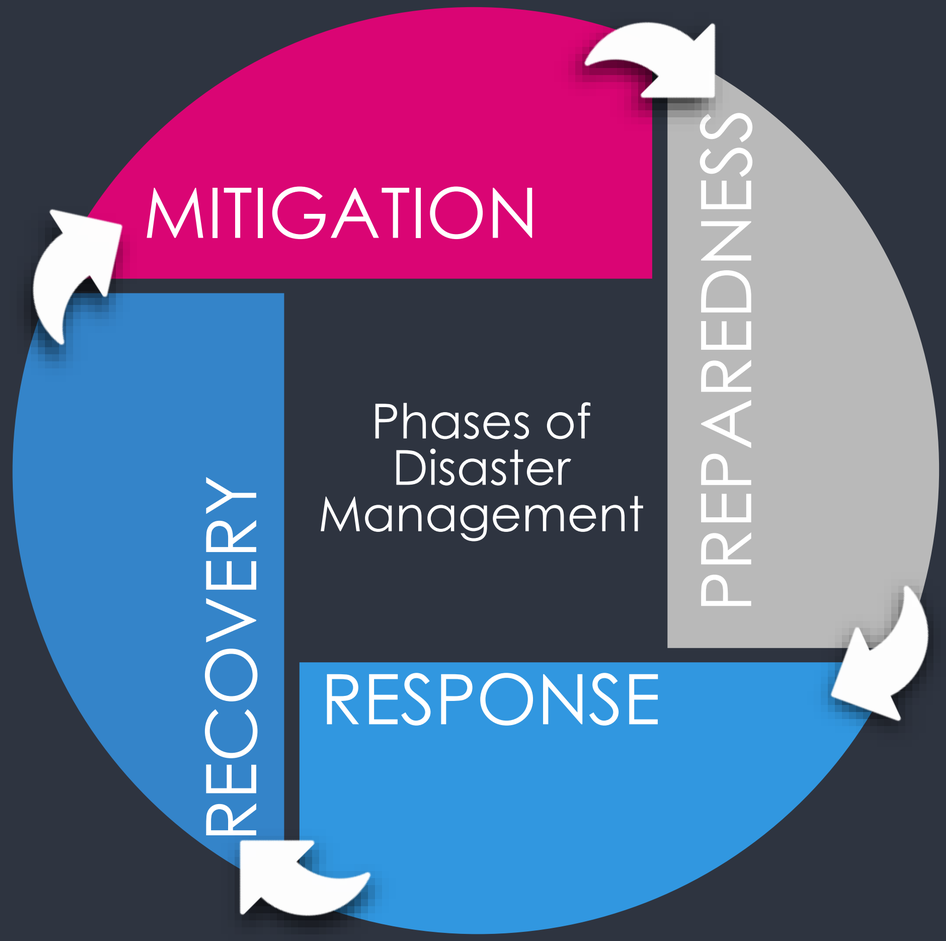
The disaster management process adopted internationally by United Nations Office for Disaster Risk Reduction (UNDRR) consists of four phases:

MITIGATION

Activities that seeks to prevent an emergency, reduce the likelihood of its occurrence, or limit the negative effects of unavoidable threats.

The activities envisaged in the mitigation phase should be considered and implemented before and after the occurrence of emergency events.

Example: Drafting the National Emergency Telecommunication Plan



MITIGATION

- Development of a NETP
- Hazard and vulnerability assessment and mapping
- Data collection, recording and analysis
- Awareness raising and education campaigns
- Development of policies and legislation
- Development of regulatory frameworks
- Allocation of financial resources
- Establishment of public-private partnerships

PREPAREDNESS

Includes the planning and preparation necessary for responding to an emergency event.

This includes the development of written plans and procedures to ensure that critical operations are maintained during and after the emergency.

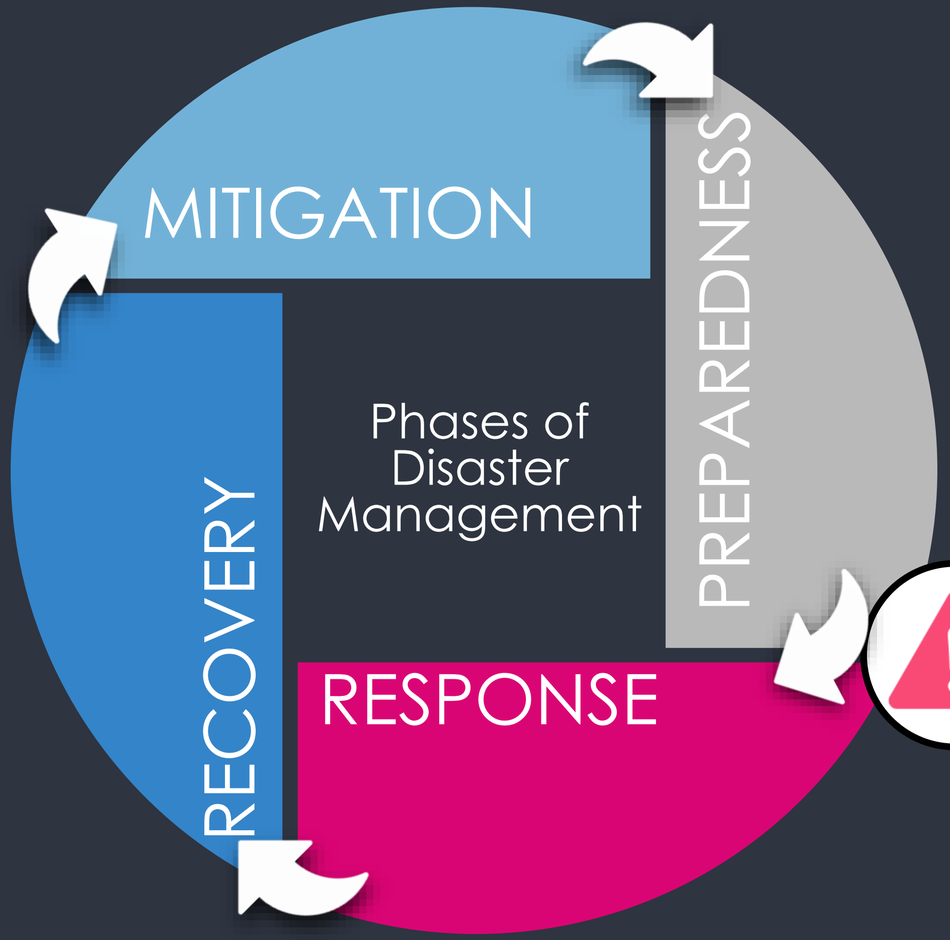
PREPAREDNESS

- Implementation of the NETP
- Development of Standard Operating Procedures SOP
- Implementation of Early Warning Systems
- Capacity building and training exercises
- Information and knowledge sharing
- Implementation and use of new technologies
- Preparation of back-up energy systems
- Use of satellite imagery

RESPONSE

Phase in which the plans and procedures established in the mitigation and preparedness phases are executed.

This phase is carried out during the emergency and includes activities such as the evacuation of affected areas, the opening of shelters, search and rescue, or establishing telecommunications means to enable survivors to locate missing family members, among other activities.



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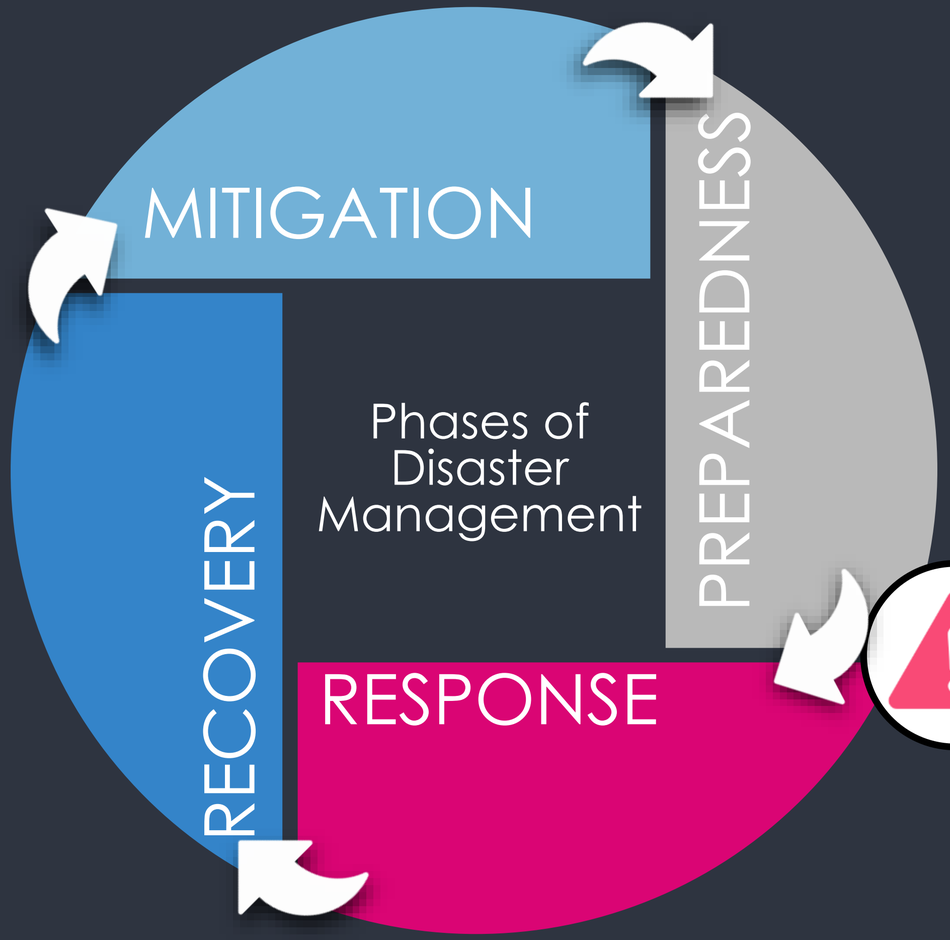
RESPONSE

- Importation of equipment
- Provision of telecommunication facilities to affected population
- Damage and needs assessment
- Provision of telecom/ICT solutions for inter-agency coordination
- Establishment of telecom/ICT solutions and links for first responders



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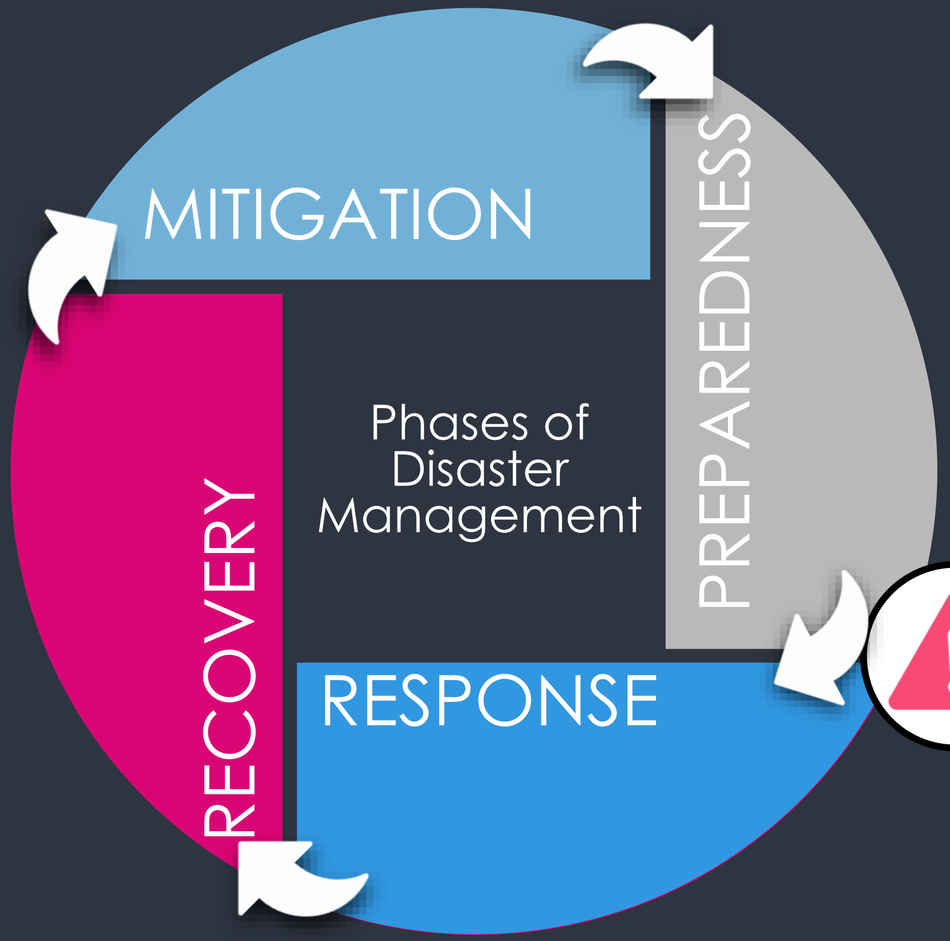
RECOVERY

This phase occurs after the disaster and focuses on providing the help needed for the community to at least return to pre-emergency levels of safety and functionality, or to improve on pre-existing conditions.

Activities during this phase include, among others, removal of debris, reconstruction of infrastructure, and restoration of public sector operations.



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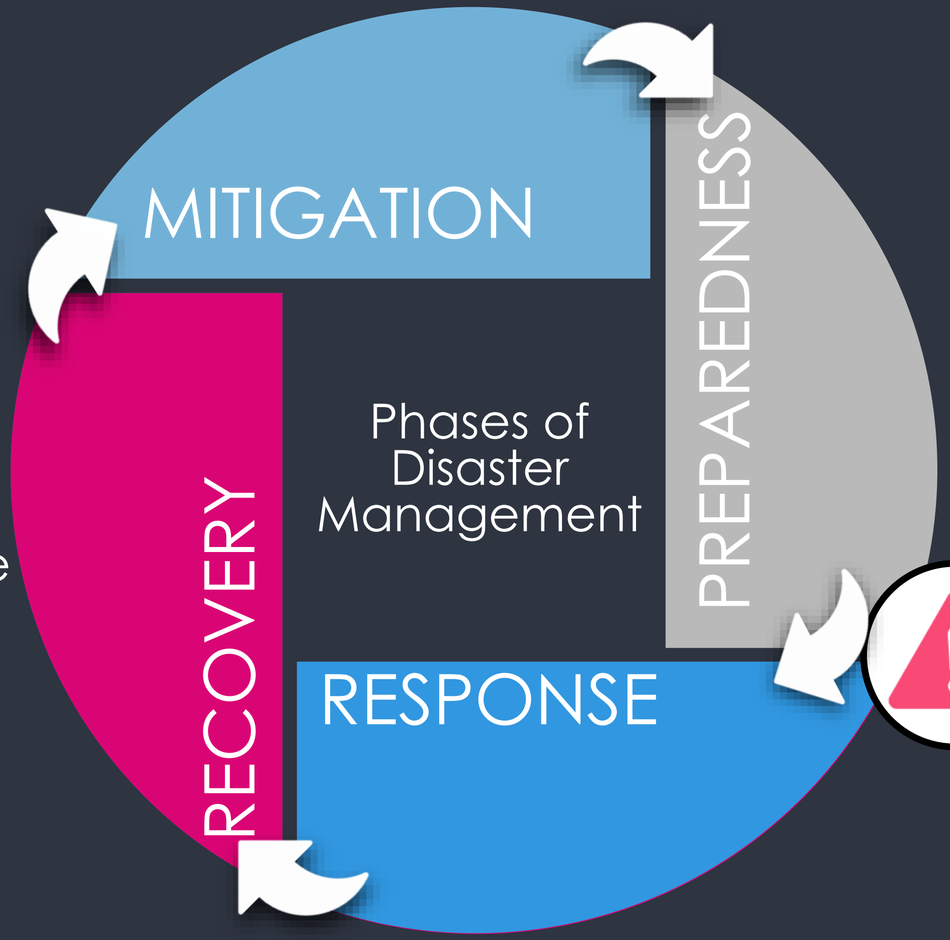
RECOVERY

- Identify best practices and lessons learned
- Restore public sector operations
- Restore telecommunications infrastructure and services
- Build resilient ICT infrastructure



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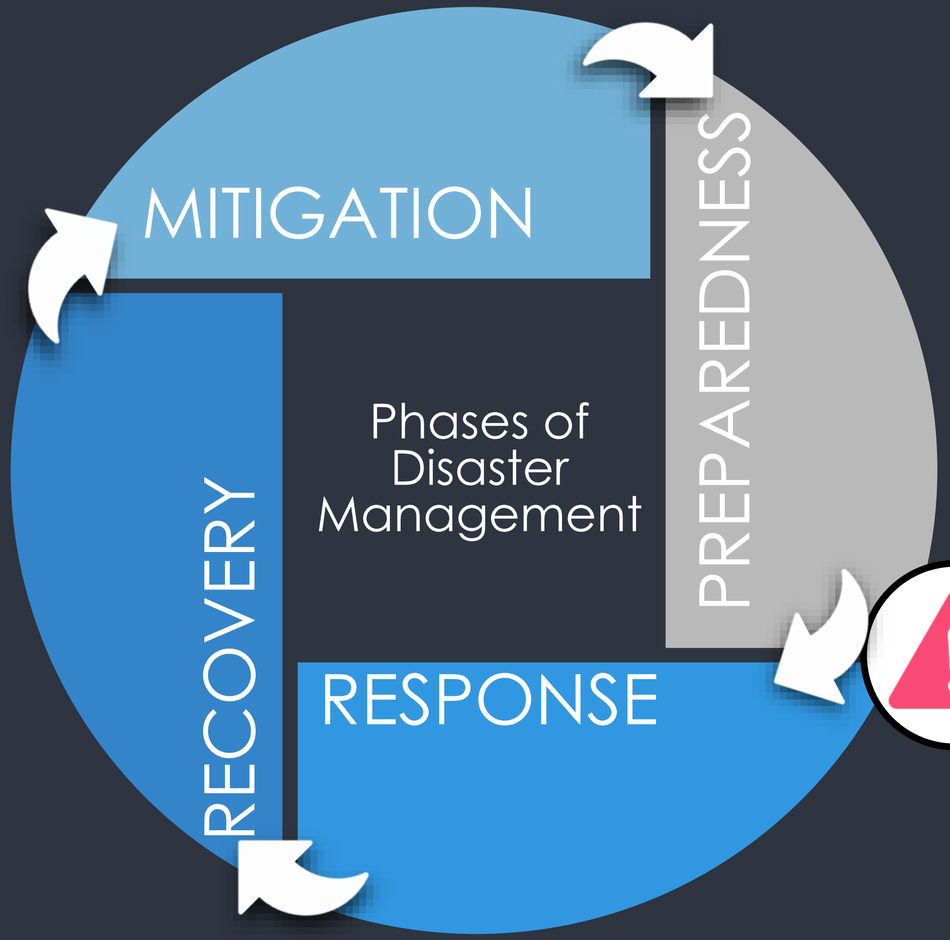
Phases of Disaster Risk Management



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What is a NETP

A NETP sets out the strategy to **enable and ensure communication availability** during the disaster mitigation, preparedness, response and recovery phases, by promoting coordination across all levels of government, between public and private organizations, humanitarian responders and within communities at risk.

Why it is so important

- Better coordination for disaster management
- Support implementation of policy and normative requirements
- Creates processes and procedures to identify national needs
- Creates a framework for national consultation and cooperation
- Establishment of multi-stakeholder roles and responsibilities
- Brings together people and resources towards common objectives

National Emergency Telecommunication Plans

The NETP should …

… be an integral part of the National Plan on Disaster Management

… ensure every organization is aware of the communication procedures and availability of the resources

… identify critical telecommunication infrastructure and resources

… ensure permanent consultation and coordination among national stakeholders

… establish disaster recovery plans and standard operating procedures

… do risk analysis of critical telecommunications infrastructures

Drafting the NETP: Principles

Multi-Hazard

- Adopt a strategy that addresses all potential hazards to which the nation is exposed

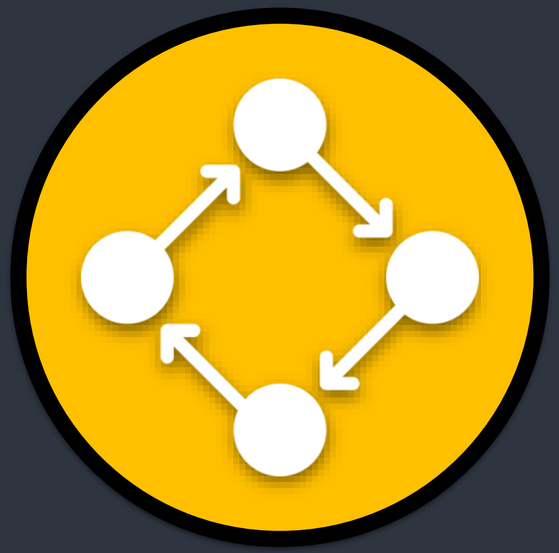
- During NETP implementation, decisions should be based upon the most accurate information available about all potential hazards

Drafting the NETP: Principles

Multi-Technology

- The NETP should make an evaluation of the Telecom/ICT infrastructure to be used in all phases of disaster management
- Standard operating procedures should identify the appropriate types of Telecom/ICT technologies required for each type of emergency
- The need for redundant communications networks should be planned for

Drafting the NETP: Principles



Multi-Phase

- Ensure the NETP addresses the links between different phases of disaster management in different types of disasters

Drafting the NETP: Principles

Multi-Stakeholder

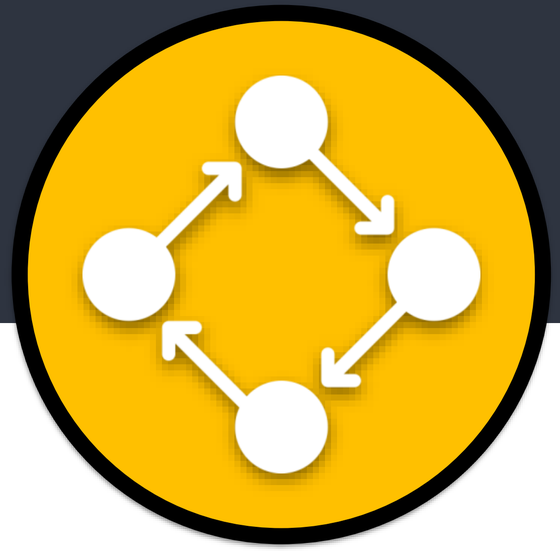
- Increase awareness and obtain commitments from all stakeholders to participate, contribute and agree on a strategy, enabling coordination with and communication among all partners
  - Government
  - Public telecom/ICT/media providers
  - Private networks
  - Civil society

- The NETP should include training and drills prioritized, supported, and enabled, for all phases of disaster management and at all levels – individual, team, department and community

Drafting the NETP: Principles

Multi-Hazard

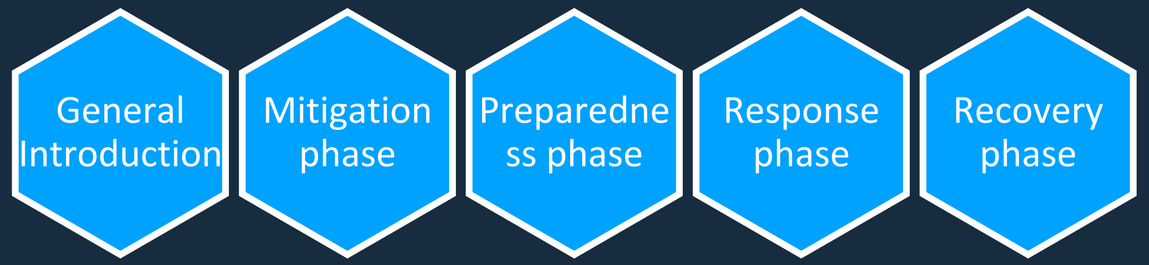
Multi-Technology



Multi-Phase

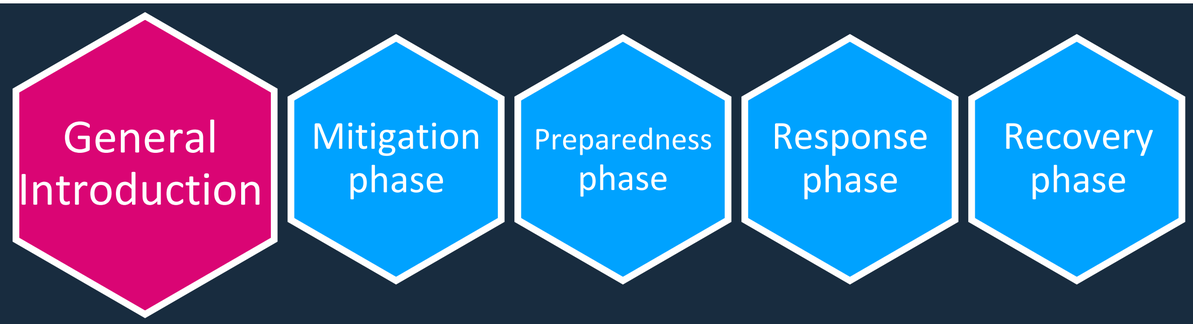
Multi-Stakeholder

National Emergency Telecommunication Plans



Topics to be included in the NETP

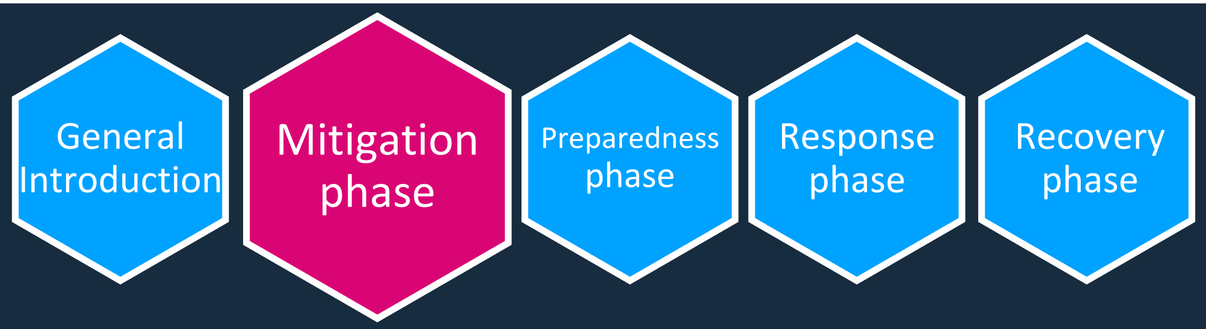
National Emergency Telecommunication Plans



Topics to be included in the NETP

- Purpose and scope of the NETP and coordination with the country's national disaster risk management plan;
- Description of the phases of disaster management and how to enable or support telecom/ICT services within each phase;
- Description of the parties involved in carrying out an NETP, including government, private industry, and other stakeholders; and,
- Identification of governance developed to enable implementation of the plan.

National Emergency Telecommunication Plans



Topics to be included in the NETP

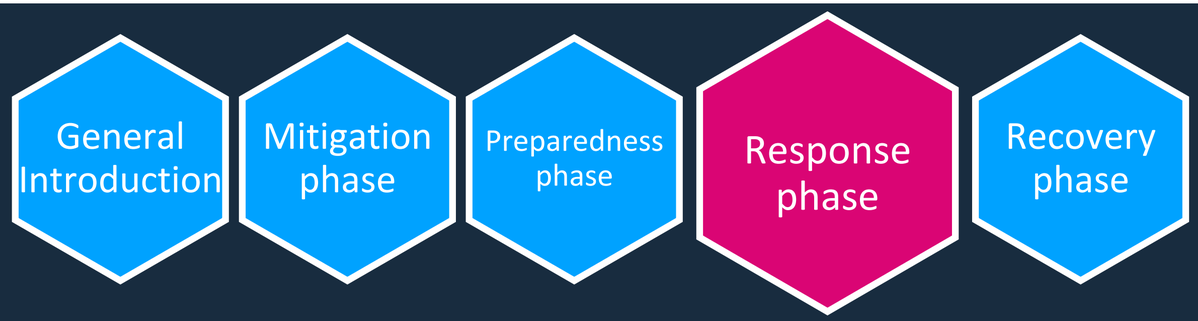
- Map showing the location and types of hazards the country faces;
- Understanding of the telecom/ICT landscape Telecom/ICT operators and service providers, facilities availability and service penetration;
- Prioritization of critical telecom/ICT networks, disaster reporting procedures for carriers that are standardized and exercised considering each of these hazards;
- Mechanisms for reducing the vulnerability and improving the resilience and redundancy of telecom/ICT networks;
- Legal and regulatory framework and authorities to support emergency telecom/ICT services; and,
- Treaties and international cooperation agreements.

National Emergency Telecommunication Plans

Topics to be included in the NETP

- Standard operating procedures;
- Contingency and rresponse plans;
- Coordination structures at all levels;
- Information sharing protocols;
- Telecom/ICT networks for monitoring, early warning and alert systems;
- Cooperation between different stakeholders, including operators and private sector;
- Training and exercises (including time frames, types, participants, schedules); and,
- Support for vulnerable people

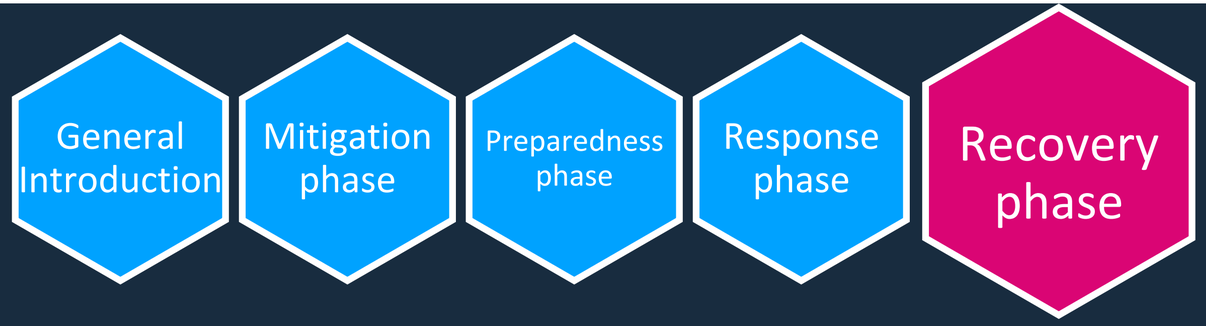
National Emergency Telecommunication Plans



Topics to be included in the NETP

- Communication and coordination among government communications and national disaster management organization contacts, with carriers, and between first responders and the full range of stakeholders;
- Gathering and analysis of data/information on immediate needs of the population, and managing the safe delivery of the response;
- Geospatial information on the disaster event;
- Situational awareness and updates; and,
- Enabling response, connecting families and friends, enabling call centers, etc.

National Emergency Telecommunication Plans



Topics to be included in the NETP

- Damage and needs assessment;
- Rebuilding and improving telecom/ICT infrastructure;
- Identifying locations in need of recovery assistance, tracking recovery activities; and,
- Enabling and coordinating reconstruction activities.

National Emergency Telecommunication Plans

Challenges

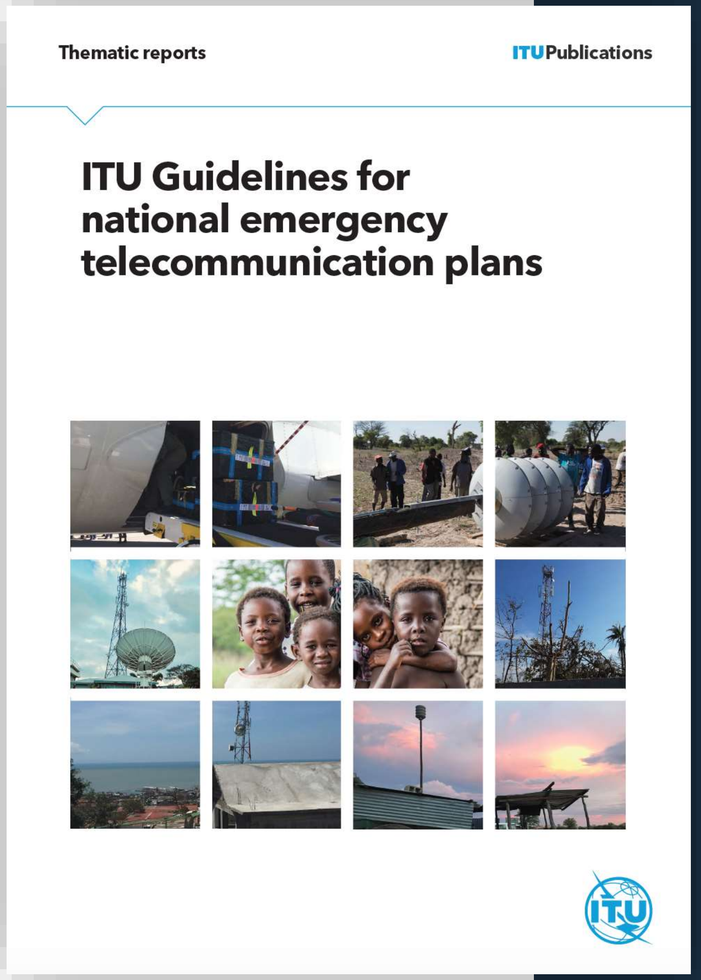
Lack of political support to develop and implement NETPs

Difficulty in establishing a committed multi-stakeholder community

Availability of financial and human resources

Lack of technical capability, skills and know-how

ITU Guidelines for national emergency telecommunication plans



- Legal and regulatory framework
- International cooperation
- Administrative structure and governance
- Capacities and drills
- Contingency plans
- People with specific needs
- Legislation and regulation
- Other topics

2 Legislation and Regulation

Legal and regulatory Framework in general

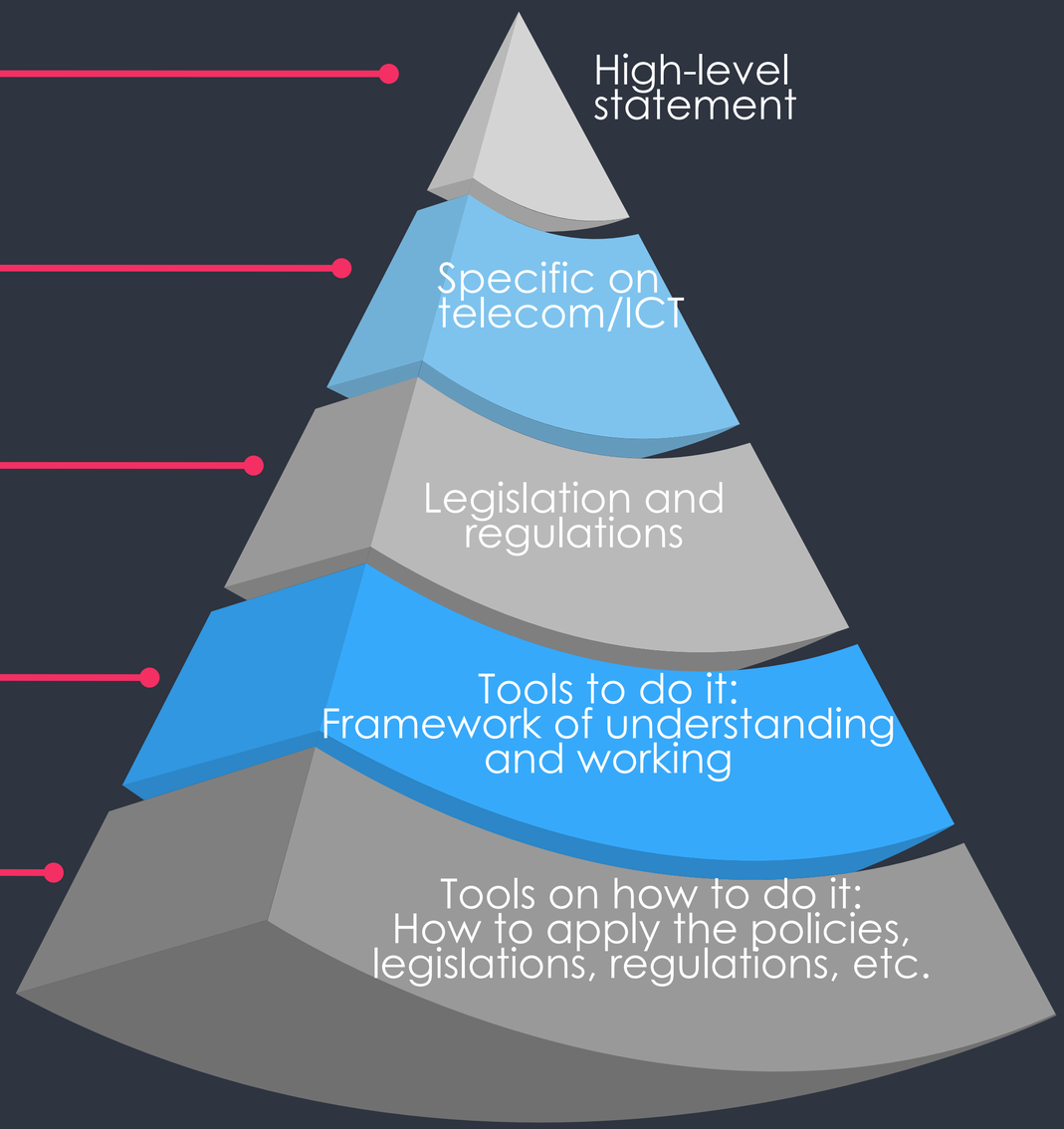
Policy, national legislation and/or national disaster risk management plan

Policies on emergency telecom/ICT that support or complement high-level statement

Appropriate laws and regulations on telecom/ICT for emergencies
Policies, laws, and regulations should be technologically neutral

NETP & guidelines development

Standard Operating Procedures (SOP) and implementation of frameworks



Legislation should:

1

Provide government the legal right to draft and approve regulations and plans for emergency and disaster risk management

2

Provide a high-level general guide on the development of NETP, allowing flexibility (drafting and implementation)

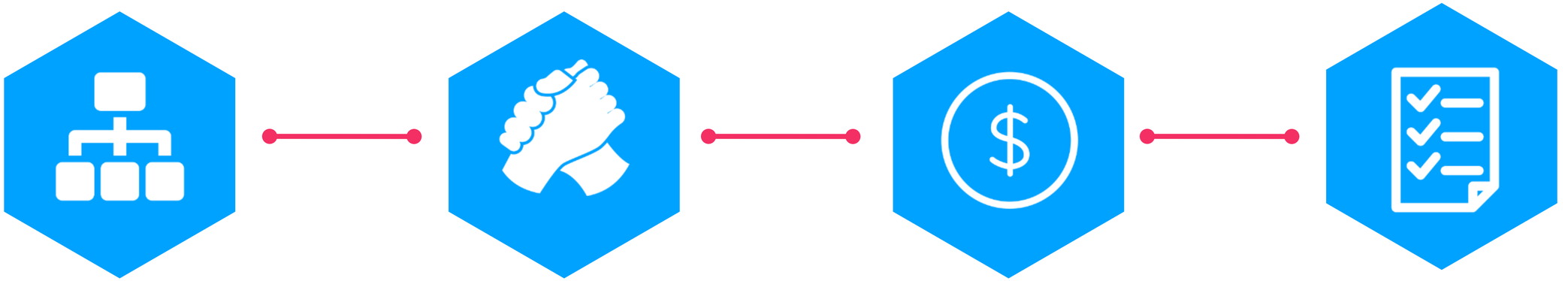
3

Objective and scope of the NETP

4

Designate a government agency responsible on the drafting and updating of the NETP

Government agency responsible of the NETP



Governance structure: responsibilities and functions

Collaborate with the private sector (PPP), including telecom/ICT providers, private networks, radio-amateurs, media, among others

Provide financing y human resources

Apply provisions based on the national characteristics and needs

Telecom/ICT Regulations

Be oriented to maintaining and reestablishing communications to mitigate the negative impact that a disaster could cause

Streamline the regulatory process to allow telecom/ICT services to be (or continue to be) available as soon as possible

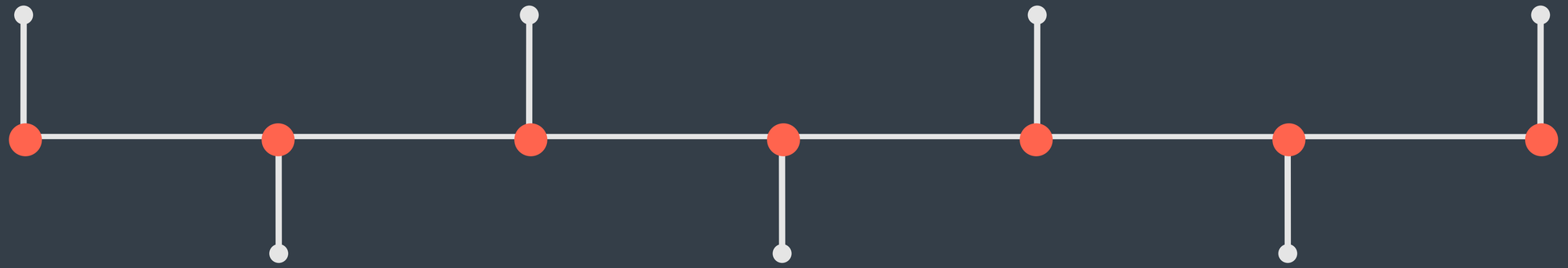
Streamline or facilitate temporary licenses and type approvals

Issue waivers as appropriate

Reduce any barriers to import / export equipment

Allow free movement of experts who can assist in restoring the network

Grant temporary spectrum permits and suspend spectrum / license fees



Legislation and regulation

Telecom/ICT service licensing

Flexibility to grant on an expedited basis, telecommunication/ICT service licenses (e.g., mobile, fixed, satellite services licenses) or approvals it deems necessary to support emergency telecommunication/ICT efforts.

Flexible, exceptional expedited licensing procedures could be in place, free of charge, for use in emergency situations.

Licenses should be **temporary** and valid only until such time as the government has determined that communications networks are restored to response areas and there is no further need for the temporary/redundant service being provided.

Legislation and regulation

Type Approval / Homologation certificate

Type Approval and Homologation certificates

- During disaster response and recovery, type approval requirements for telecommunication/ICT critical equipment can be waived
- Regulatory authorities can recognize foreign type approvals to expedite the process including by utilizing the guidelines of the ITU Telecommunication Standardization Sector (ITU-T)

Legislation and regulation

Importation of equipment

- Major delays during the importation of telecommunication/ICT critical equipment for disaster relief have a negative impact on the response time to a disaster
- Delays can occur for several reasons
  - Lack of priority given to communications when it is not considered an essential support function
  - Lack of coordination with customs (i.e., not informing customs that communications are a priority)
  - Imposing duties or tariffs on equipment provided for temporary use
  - Restrictions based on local standards
  - Extensive paperwork
  - Disorganized processes
- Rules could be in place to:
  - Prioritize incoming communications equipment as being essential to response
  - Expedite the importation process of critical telecommunication/ICT equipment for disaster response
  - Exemptions from duties and tariffs, clear expedited processes and streamlined paperwork
- Once the equipment needs to be returned to the place of origin, expedited processes should be in place to help streamline the return process

Legislation and regulation

Spectrum management

Governments are responsible of spectrum planning and management:

- Radio-communication service allocation (primary and secondary service)
- Band plan channelization and technical specifications
- Unlicensed/licensed spectrum (unlicensed does not mean unregulated)
- Exclusive and non-exclusive licensing
- Surveillance and enforcement of radio regulations
- Others

Follow ITU Radio Regulations

Radio-communication services defined by the ITU Treaty modified every ~4 years at the World Radio Conference

Frequencies allocated to specific radio-communication services
~40 radio communication services:

Legislation and regulation

Spectrum management

Emergency Radio-communications (ITU-R)

Disaster phases	Major radiocommunication services involved	Major tasks of radiocommunication services
Prediction & Detection	• Meteorological services (meteorological aids and meteorological-satellite service) • Earth exploration-satellite service	Weather and climate prediction. Detection and tracking of earthquakes, tsunamis hurricanes, typhoons, forest fires, oil leaks etc. Providing warning information
Alerting	• Amateur services	Receiving and distributing alert messages
	• Broadcasting services terrestrial and satellite (radio, television, etc.)	Disseminating alert messages and advice to large sections of the public
	• Fixed services terrestrial and satellite	Delivering alert messages and instructions to telecommunication centres for further dissemination to public
	• Mobile services (land, satellite, maritime services, etc.)	Distributing alert messages and advice to individuals
Relief	• Amateur services	Assisting in organizing relief operations in areas (especially when other services are still not operational)
	• Broadcasting services terrestrial and satellite (radio, television, etc.)	Coordination of relief activities by disseminating information from relief planning teams to population
	• Earth exploration-satellite service	Assessment of damage and providing information for planning relief activities
	• Fixed services terrestrial and satellite	Exchange of information between different teams/groups for planning and coordination relief activities
	• Mobile services (land, satellite, maritime services, etc.)	Exchange of information between individuals and/or groups of people involved in relief activities

Legislation and regulation

Spectrum management

Public Protection and Disaster Relief (PPDR)

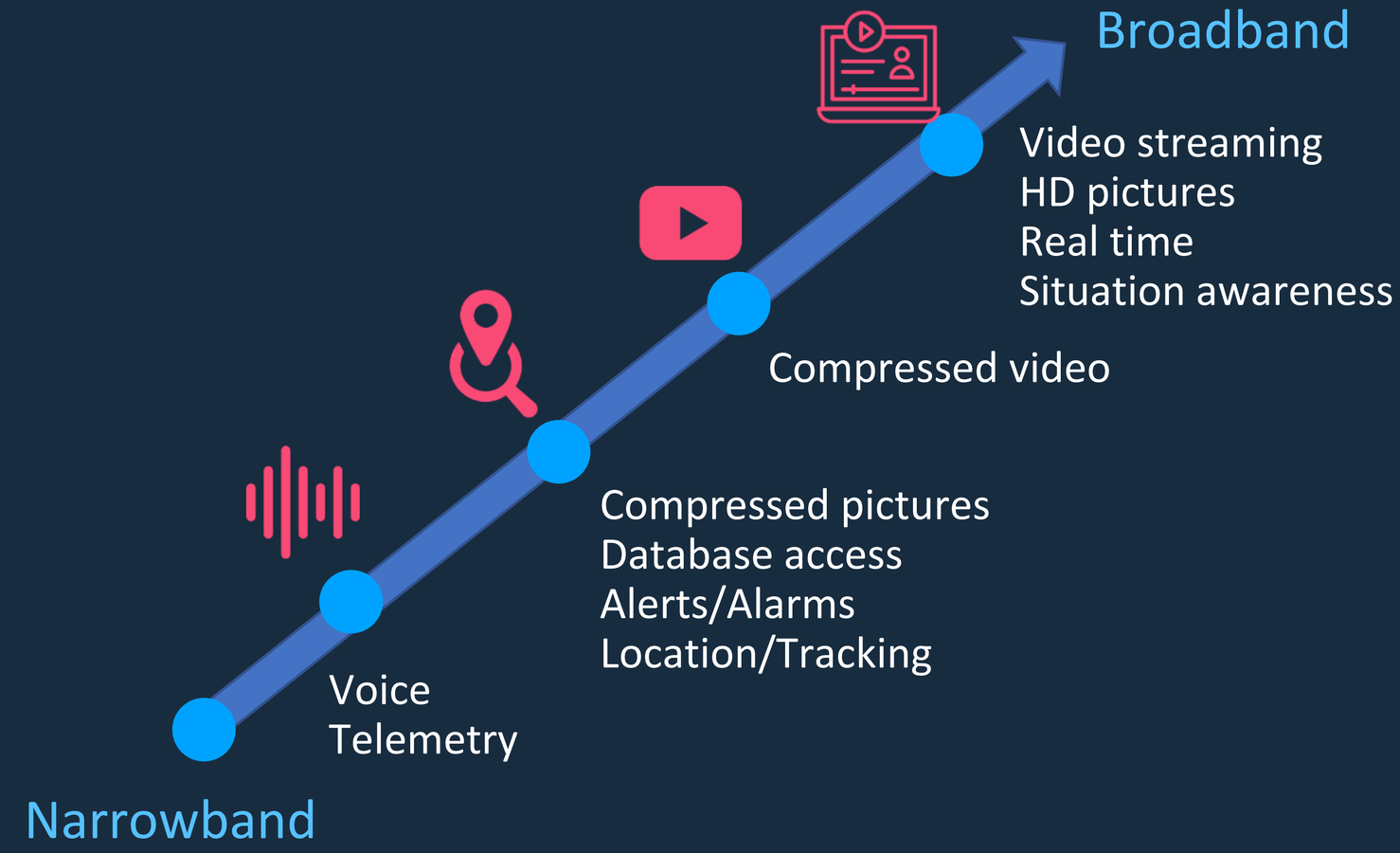
Public Protection: Maintaining law and order, protecting life and property, responding to emergencies

Disaster Relief: Responding to serious disruptions of the functioning of society that pose a significant widespread threat to human life, health, property, or the environment

Legislation and regulation

Spectrum management

Public Protection and Disaster Relief (PPDR)



Legislation and regulation

Spectrum management

Public Protection and Disaster Relief

General principles:

- Interoperability: Allow first responders on the network to access other users, as authorized, from anywhere and at anytime
- Permanent access: Allow first responders to have permanent, immediate and uninterrupted access to the network
- Coverage: provide access in uncovered urban, rural and remote areas
- Resilience: be resilient and robust to meet the access requirements mentioned above
- Provide mission critical services: offer mission critical services to first responders, including data and video
- Security: include network security mechanisms for information and data
- Sustainability: be friendly to the environment and establish resources to keep updated in the future, meeting the goals and needs required
- Accessibility: be accessible to the entire community of first responders
- Spectrum use: use spectrum efficiently and effectively

Source: Progress Report on National Public Safety Broadband Network, Canada (2020)

Legislation and regulation

Spectrum management

Public Protection and Disaster Relief (PPDR) Spectrum utilization models

Model One

Public Safety Exclusive Dedicated Network

(Dedicated Network)

A dedicated public safety network, with spectrum used exclusively by public safety users (using the 700 MHz Public Safety Broadband (PSBB) and D Blocks) (e.g. South Korea - SafeNet)

Model Two

Shared Public Safety-Commercial Network

(Shared Network)

A network that supports both public safety and commercial usage (with distinct public safety and commercial network cores), with priority access and pre-emption rights for public safety use during emergencies and other times of need (e.g. United States - FirstNet)

Model Three

Commercial Network

(Commercial Network)

The public safety community obtains services from one or multiple commercial carrier(s) using that carrier's existing network spectrum (e.g. United Kingdom)

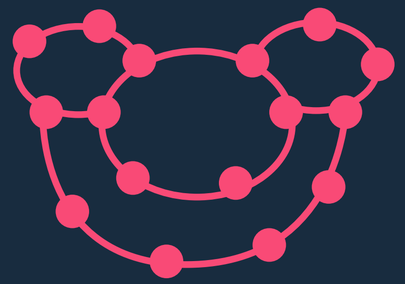
Source: Progress Report on National Public Safety Broadband Network, Canada (2020)

Legislation and regulation

Priority call routing

Emergency numbers

- During emergencies, networks fail to provide service for different reasons: e.g., power outages, infrastructure collapses and network congestion, which can delay or prevent critical communications between first responders
- Regulations could be put in place to establish priority call routing on both mobile and fixed networks for people engaged in response and recovery activities during emergencies, as well as other entities and institutions involved in such activities
- Emergency numbers



Network redundancy

- Network redundancy is a critical element of a robust network that will **minimize telecommunication/ICT outages** in the event of an emergency
- Communications networks need to **consider redundancy and resilience** in their design to ensure that redundant capacity is available as needed
- Regulators should encourage and ensure that **telecommunication/ICT providers have networks with the adequate redundancy** and multiple connectivity backhaul options

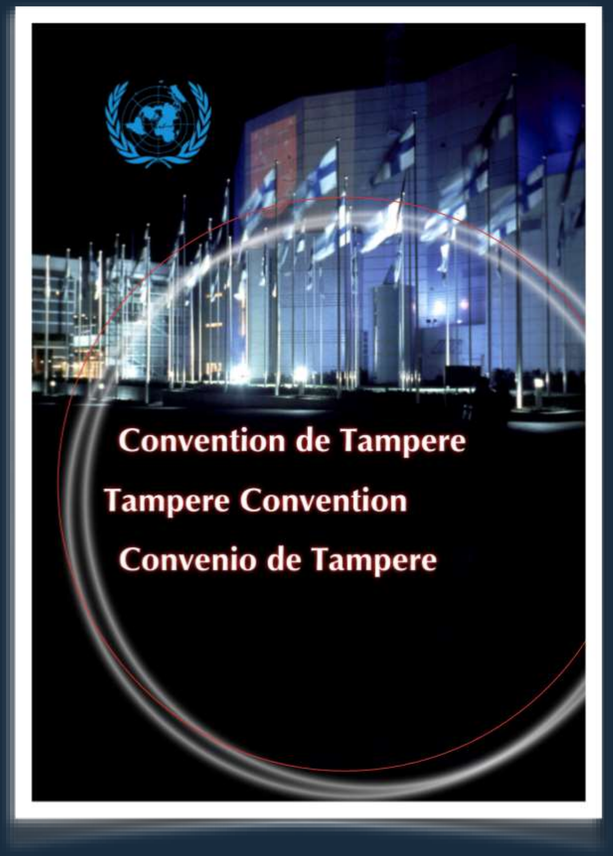
Contingency plans

- A contingency plan regarding telecommunications for disaster management implies **establishing operational procedures to enable communications in specific areas**
- Response and contingency plans should establish arrangements in advance to **support the continued operation and restoration of communications**
- Inputs to contingency plans should be based on the typology of disaster analysis and should identify the lack of telecommunication/ICT infrastructure in vulnerable regions
- A contingency plan should include specific procedures such as:
  - Level of prior connectivity of the site
  - Operational/available telecommunication/ICT facilities
  - Pre-positioned equipment that could be deployed in the area

    - Power outages: on-site generators and back-up power sources and deploy portable generators
    - Avoid congestion by network traffic management if needed
    - Cellular on Wheels (COW) - mobile cell sites
    - Store satellite terminals (e.g. VSAT) in safe warehouses ready to be deployed

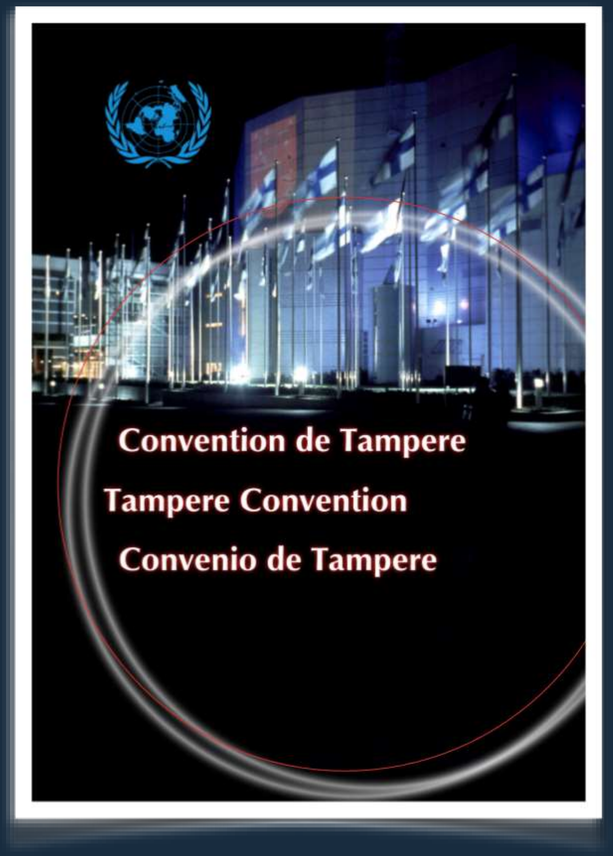
3 International Treaties

International treaties
Tampere convention



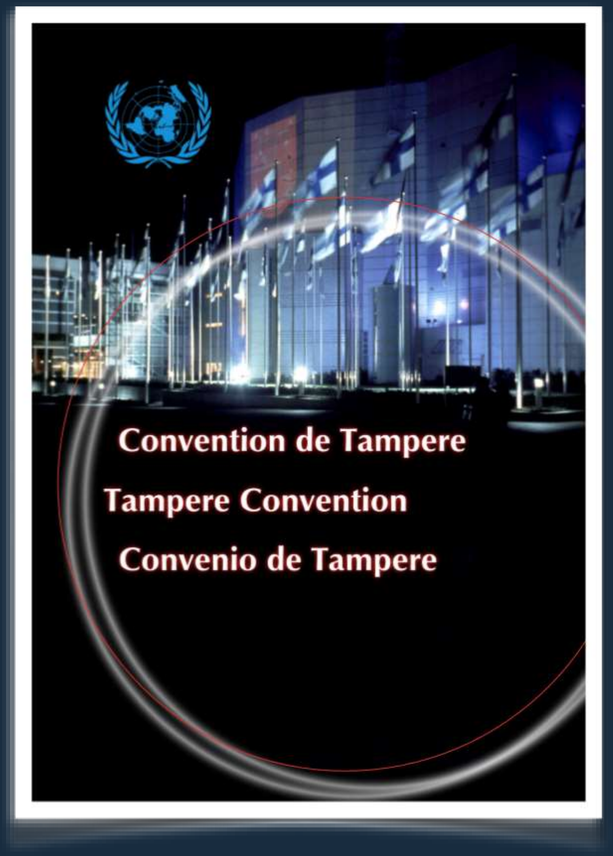
- Tampere Convention is designed to facilitate the use of telecommunications resources for disaster mitigation and relief
- The treaty establishes a framework for international cooperation for states, non-governmental entities, and intergovernmental organizations

International treaties
Tampere convention



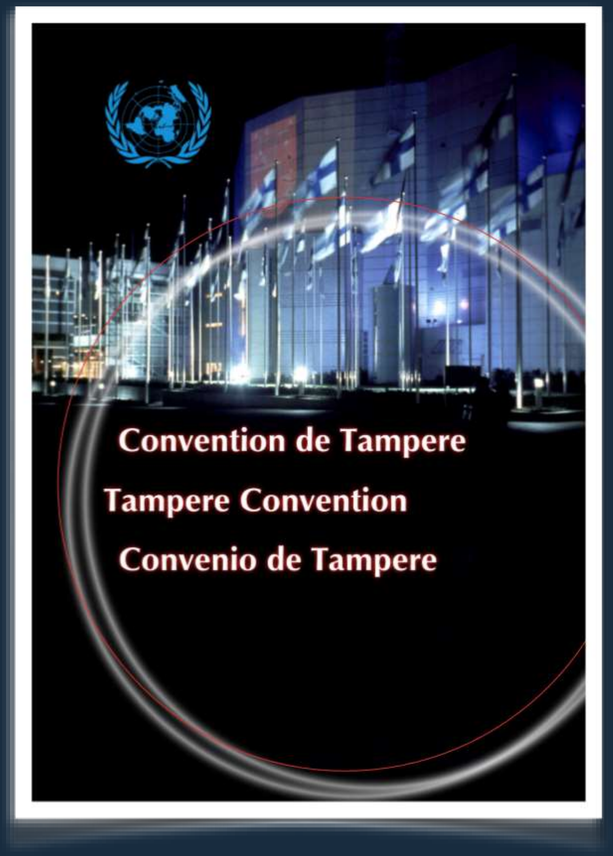
- This Convention is based on the following basic principles:
  - Reduce or eliminate regulatory barriers to the use of telecommunications resources for mitigation and disaster relief
  - Reduce regulatory barriers to the transit of personnel, equipment, materials and information through the affected territory
  - Guarantee the necessary privileges, immunities and facilities for relief personnel and organizations providing telecommunications assistance
    - Immunity from arrest, detention or prosecution
    - Immunity from confiscation or embargo of their equipment, materials and property
    - Exemptions from tax obligations and other charges (excluding VAT)
    - Access to local facilities
    - Exemption from licensing requirements or fast tracking of licensing applications
    - Protection of staff, equipment and materials

International treaties
Tampere convention



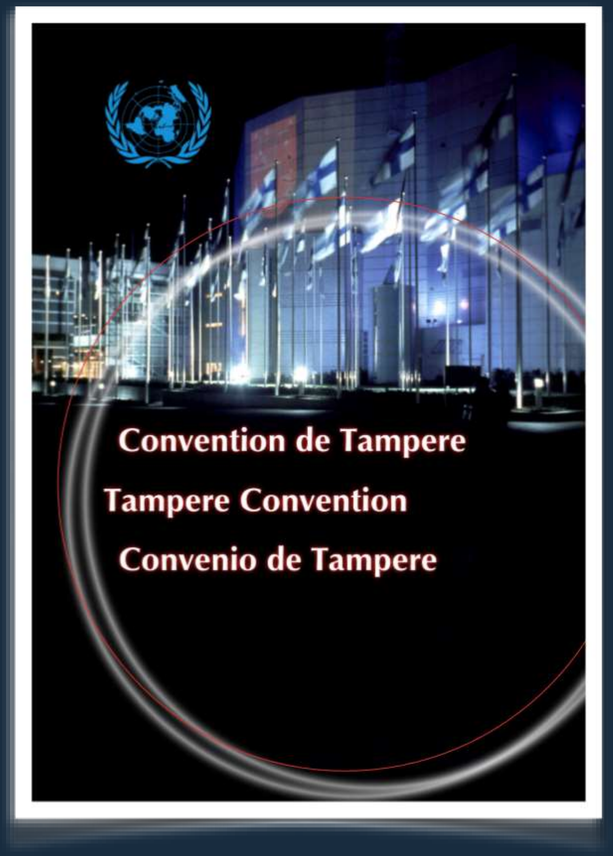
- This Convention is based on the following basic principles (cont.):
  - Improve coordination and exchange of information
  - Foresees the establishment of bilateral agreements
  - Respect for the sovereignty of the country receiving assistance
  - The host government retains the right to supervise the assistance

International treaties
Tampere convention



- A country can express its consent to be bound by Tampere Convention by any of the following means:
  - By signature (definitive signature)
  - By signature subject to ratification, acceptance or approval, followed by the deposit of an instrument of ratification, acceptance or approval
  - By deposit of an instrument of accession
- Accession to the Convention, open to any member state of the United Nations or the ITU, comes into force 30 days after the deposit of instruments of ratification, acceptance, approval, accession or definitive signature of thirty (30) states

International treaties
Tampere convention



- The accession and the adaptation of national laws and regulations is not sufficient to ensure that the Convention will be effective in a disaster situation

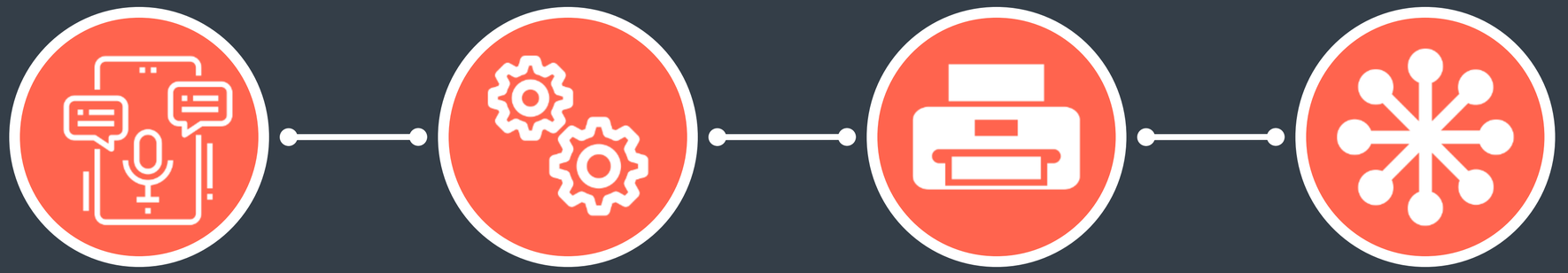
- Efficient implementation at the national level requires all of the different government agencies and national authorities involved in disaster management, including customs and excise officials at the border approving the importation of emergency equipment, to be aware of the treaty's terms and procedures and have a clear knowledge of the framework

Emergency telecommunications Cluster (ETC)

The ETC is led by the World Food Program and consists of a global network of organizations working together to provide timely and effective inter-agency communications services in humanitarian emergencies.

The primary objective of the ETC is to provide, within 48 hours of its activation in response to a disaster, vital communications services (voice and Internet connectivity) to assist humanitarian workers in life-saving operations.

ETC coordination



Provide voice and data communications around the main operations center

Provide support through a technical help-desk

Deploy basic ICT support (network connection, printers, etc.)

Other information coordination and management activities

4

Early warning and emergency alert systems

Early warning systems

Four elements of the end-to-End, people-centered early warning system

- Are key hazards and related threats identified
- Are roles and responsibilities of stakeholders identified?
- Is risk information consolidated

Disaster Risk Knowledge

Detection, monitoring, analysis and forecasting of hazards and possible consequences

- Are the monitoring systems in place?
- Are the forecasting and warning services in place?
- Are there institutional mechanism in place?

- Are organizational and decision-making process in place and operational?
- Are communications systems and equipment in place and operational?
- Are impact-based early warnings communicated effectively prompt action by target groups?

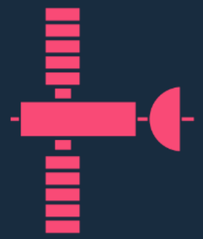
Warning dissemination and communication

Preparedness and response capabilities

- Are disaster preparedness measures, including response plans, developed and operational?
- Are public awareness and education campaigns conducted?
- Are public awareness and response tested and evaluate?

Early warning systems

- EWS should, when possible, **take advantage of economies of scale** and enhance sustainability and efficiency through a multipurpose framework that considers multiple hazards and end-user needs



- **Meteorological satellites and Earth-exploration satellite services** may be suited for identifying areas at risk; forecasting weather and predicting climate change; detecting and tracking earthquakes, tsunamis, hurricanes, etc.; and providing warnings/alerts about disasters, among other things

- Satellite imagery can be helpful to map the location and condition (both pre- and post-disaster) of roads, bridges, medical facilities and other critical infrastructure, and provide precise information on this infrastructure so that first responders can make better decisions regarding relief efforts

Early warning systems

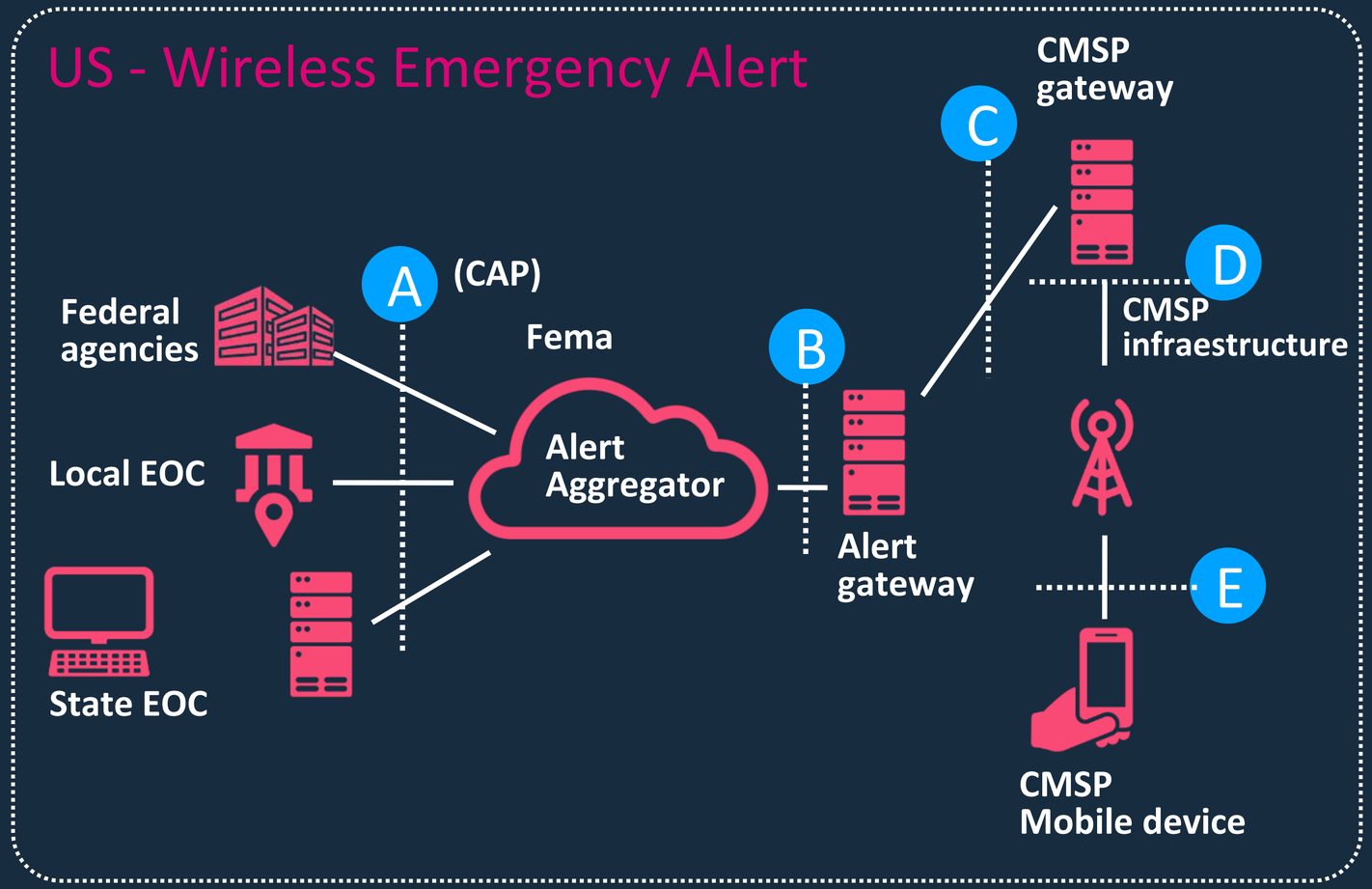
- A comprehensive EWS strategy should use both terrestrial and satellite services to monitor possible disasters and provide accurate and timely warnings and alerts

- **Broadcasting services** can alert people of impending disasters

- **Mobile services** can distribute notifications via mobile broadcast technology, specific apps developed by governments can provide warnings

- Other types of warning systems, based on sirens or public address systems connected to sensors that trigger an alarm when a specific threshold is reached, can also be developed

Early warning systems

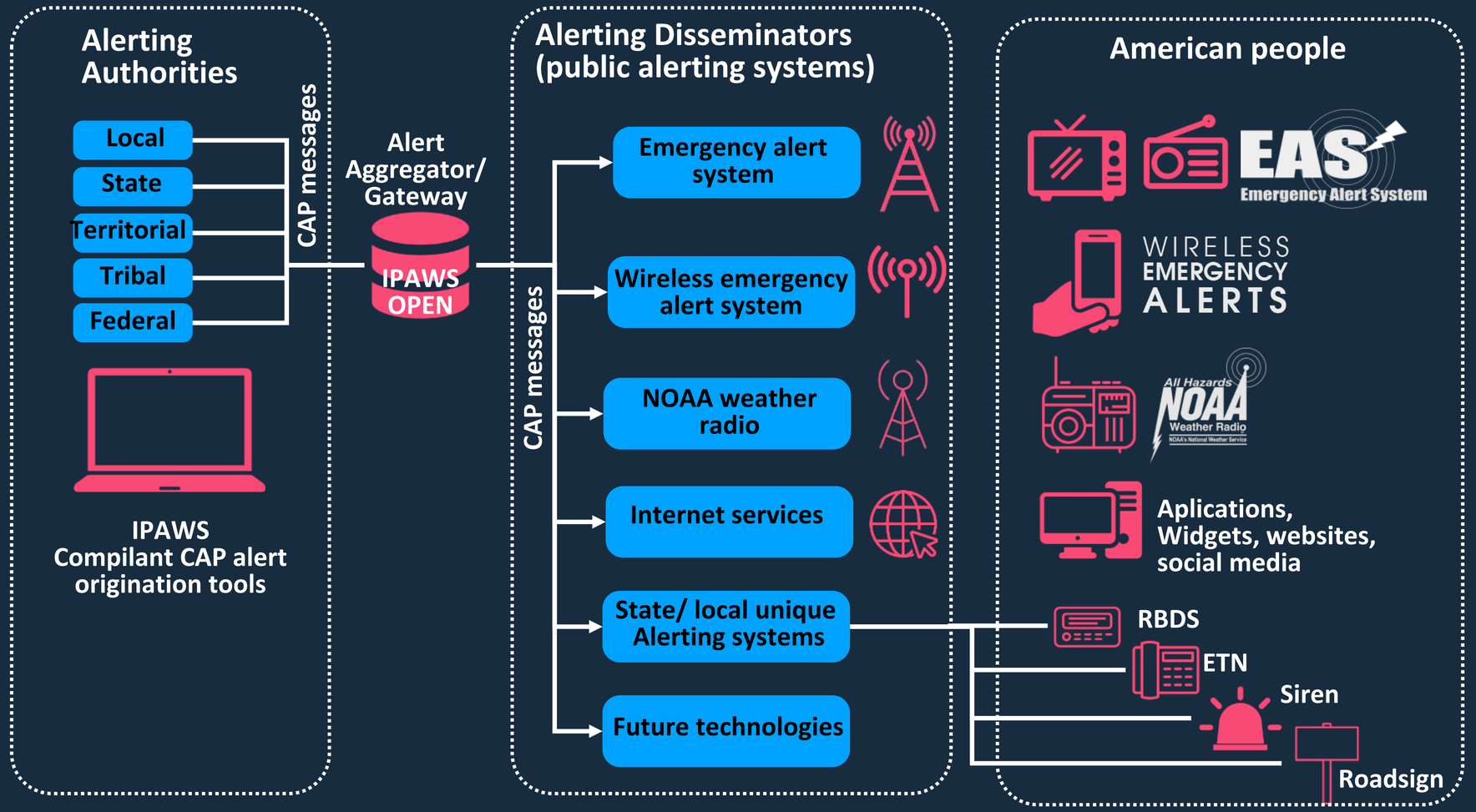


Mobile solution:

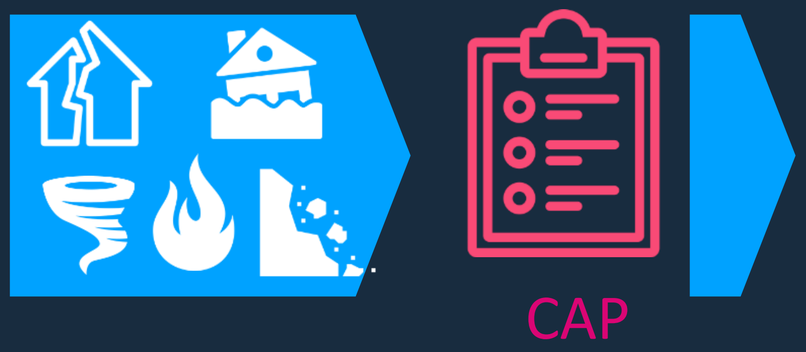
- Cell broadcast service (CBS)
- Point-to-multipoint
- 3GPP standard
- Devices capable of receiving alerts (2013)
- No congestions issues
- No privacy issues

Early warning systems

US - Integrated Public Alert & Warning System (IPAWS)



Common Alerting Protocol



- Broadcast on television
- Broadcast on radio
- Trigger sirens
- Text to speech
- Translate language
- Call telephones
- Send faxes
- Send e-mail
- Send SMS messages
- Re-direct traffic

- Common Alert Protocol (CAP) is a **simple format for exchanging emergency alerts and public warnings on any type of network**
- CAP allows a warning message to be broadcast simultaneously on many different warning systems, thereby increasing the effectiveness of the warning and simplifying the task of broadcasting that warning
- CAP also provides a template for effective warning messages, based on best practices identified in academic research and real-world experience.
- CAP offers capabilities including, but not limited to:
  - Flexible geographic targeting using latitude / longitude shapes and other three-dimensional geospatial representations
  - Multilingual and multi-audience messages
  - Improved message update and cancellation functions
  - Template support to frame complete and effective warning messages
  - Digital encryption support and signature capabilities

Early warning systems

Eastern Uganda – Flood Early Warning Systems

Three main components:

1. A sensor placed in the river
2. A solar-powered siren adjacent to the river; and,
3. A solar-powered Control Centre at the district headquarters with backup computers to monitor the performance of the sensors and siren system

Standard Operating procedure (SOP)

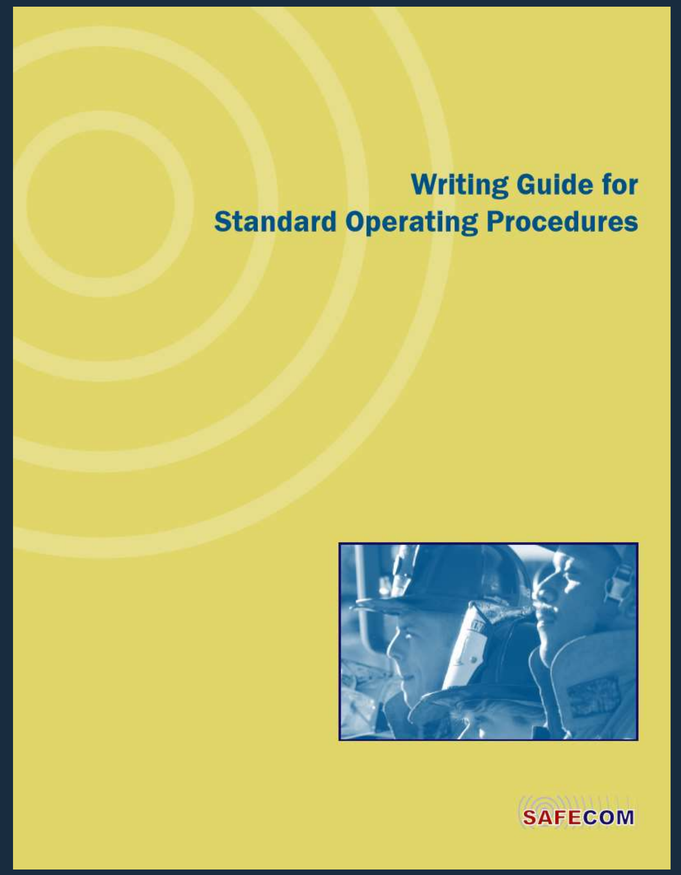
SOPs:

- Detailed instructions on how to carry out the specific operational tasks or activities of emergency response
- Should be designed to promote a standardized and uniform response during emergency response operations
- Interoperable emergency communications terminology, backup solutions and systems

Safecom's guide to develop Standard Operating Procedures:

SOPs are "*formal written guidelines or instructions for incident response, that typically have both operational and technical components, and enable emergency responders to act in a coordinated fashion across disciplines in the event of an emergency*"

Clear and effective SOPs are essential for any community to prepare and respond to an emergency



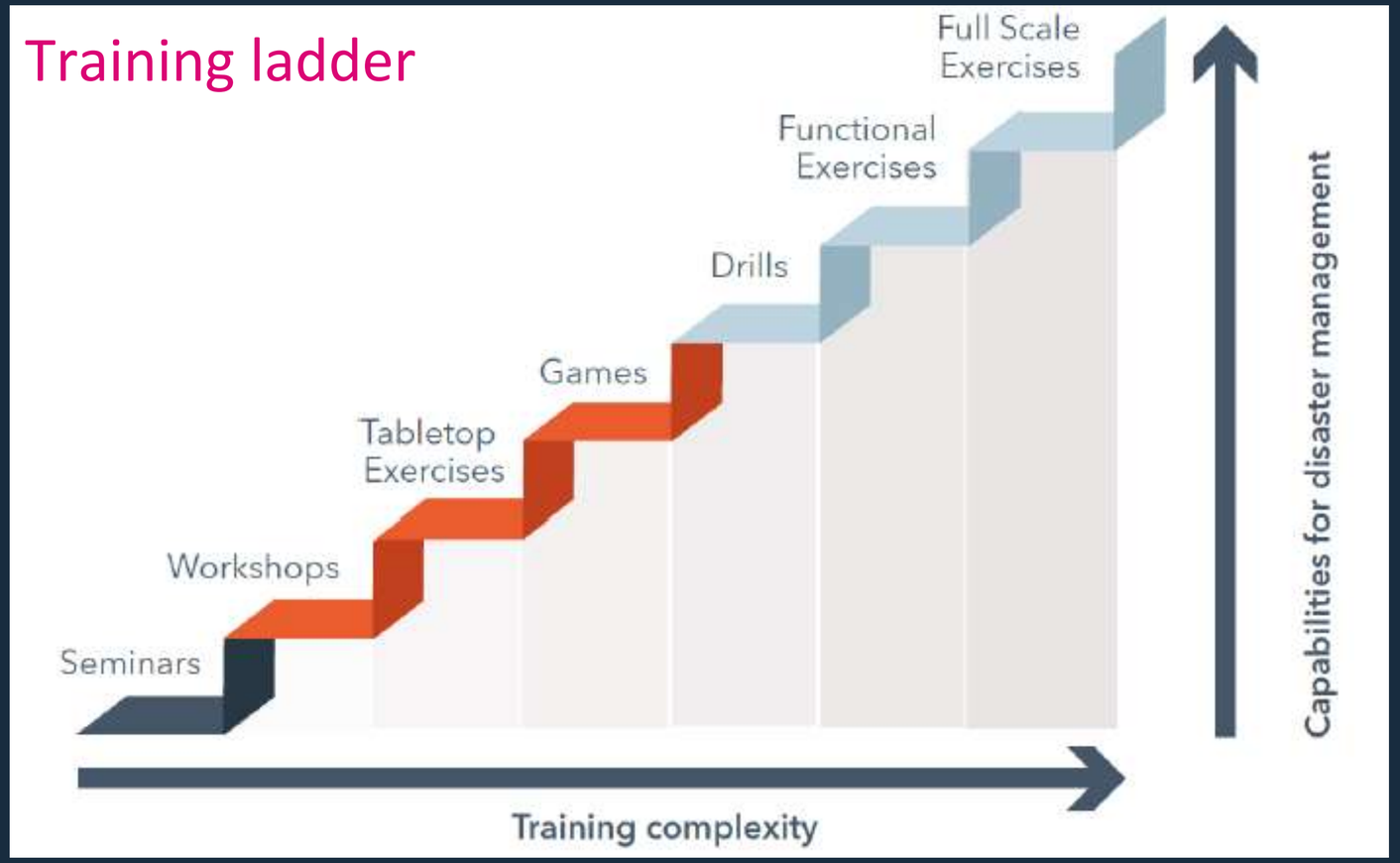
Drills and training

Capacity building requires not only practice **drills, training activities, tests and other exercises**, but also the **development of the curriculum** for these activities and the evaluation and possible modification of existing procedures and policies

On capacity-building and skills development, focus should be on, but not limited to:

- Identifying best practices in existing programs and developing operating procedures and other guidance that respond to the needs of relevant stakeholders;
- Enhancing emergency management programs through better information sharing;
- Identifying risk assessment and risk management methodologies;
- Developing, documenting and maintaining information regarding national emergency management decision-makers;
- Identifying critical infrastructure to better support emergency preparedness and response;
- Conducting regional workshops, skills enhancement seminars and conferences; and
- Developing and conducting various drills, including talk-through/walk-through exercises, and functional and full-scale simulations.

Drills and training



Drills and training

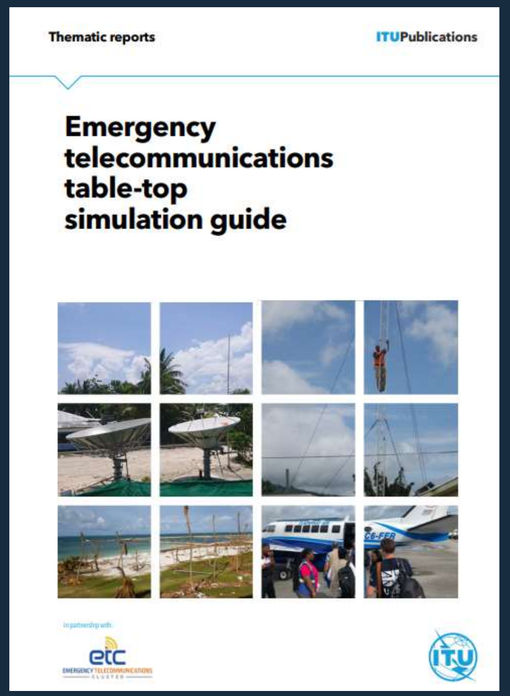


Table-Top Simulation Exercises Guidelines

These type of exercises are desk-based, and help participants to test and refine national plans, particularly national emergency telecommunications plans - including policies and regulatory frameworks. The exercises also give an overview of whether networks, redundant communications capacity, personnel, and other telecommunication systems are in place and ready to be used for disaster response.

The guidelines offers a step-by-step process for creating table-top simulation exercises at national and local levels and provides all the necessary tools to practice informed decision making and coordination using a multi-disciplinarily stakeholder approach.

Support for people with specific needs

Disasters are especially difficult for vulnerable people:

- Persons with disabilities

- Children

- The elderly

- Migrant workers

- The unemployed

- People with lack of connectivity skills, and

- Those displaced from their homes due to previous disasters

It is important to ensure that disaster management plans reflect and respond to their needs

Thank you!
Questions & answers

Maritza Delgado
ITU

December 15, 2020