

Disaster Management Communication System (DMCS)

Outline

- Definition of DMCS
- DMCS, Whose responsibility?
- Bhutan Telecom & TDRM
 - Network Reliability
 - Disaster Countermeasure Policies,
 - Before the Disaster (Preparedness)
 - During the Disaster (Response)
 - After the Disaster (Re-Habilitation)
 - Scope of work
 - Annex
- Conclusion

Definition of DMCS

1. Target Concept

1. Data Collecting

- Monitor behavior of a natural disaster **continuously**
- Measures remotely rainfall quantities and water level at given points of a river, lake or swamp
- Measures remotely seismic data for volcano activities or earthquake

2. Data Analyzing and Forecasting

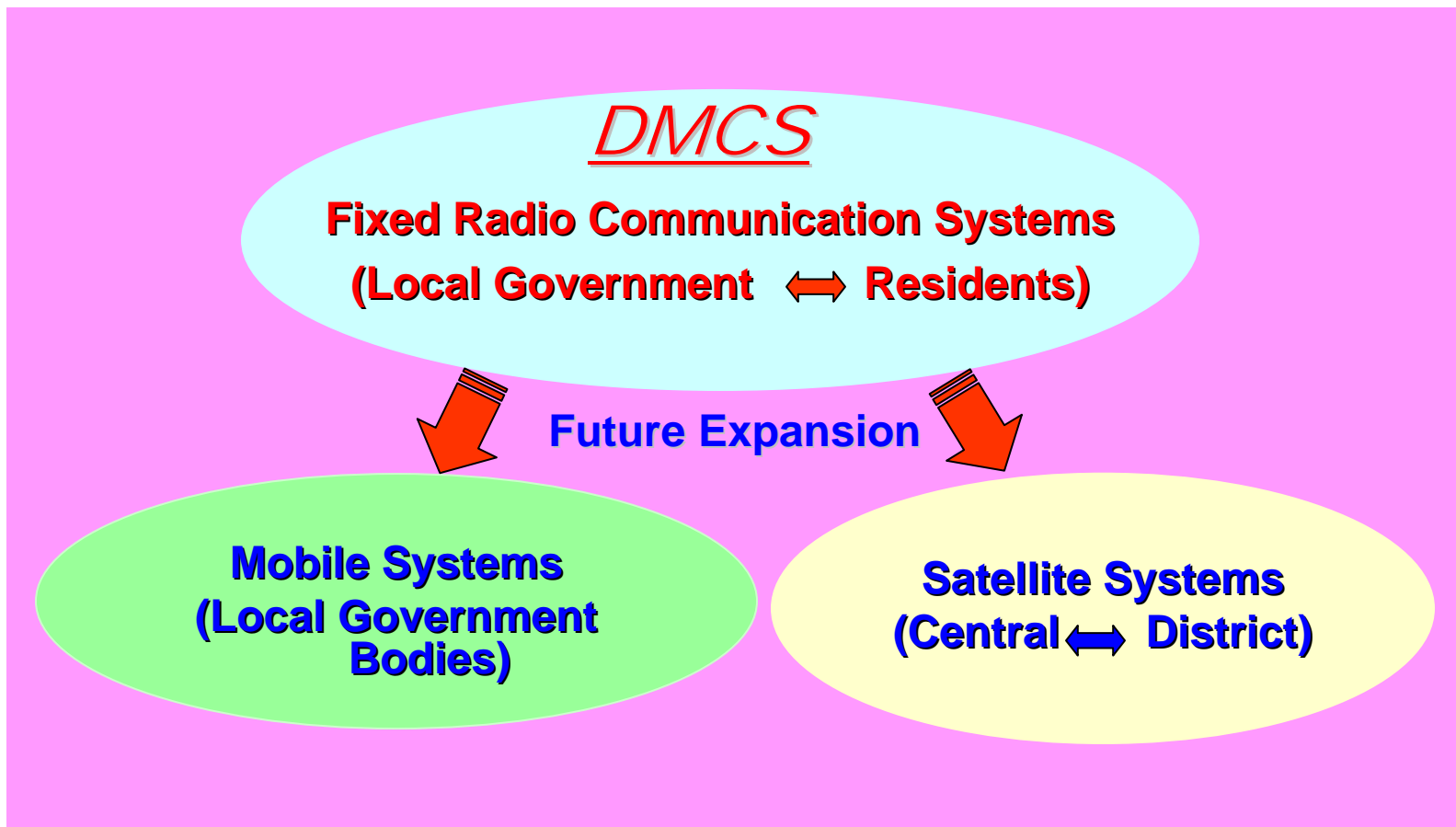
- Process for analyzing natural phenomenon
- Forecast threat before disaster happen
- Support an appropriate decision making

3. Dissemination of disaster information and share

- Share an disaster information in National, Dzongkhag' Gewog and Municipal Level
- Alert inhabitants
- Delivers speaker or siren alerts and voice broadcasts to warn regional inhabitants living at disaster prone areas for safety

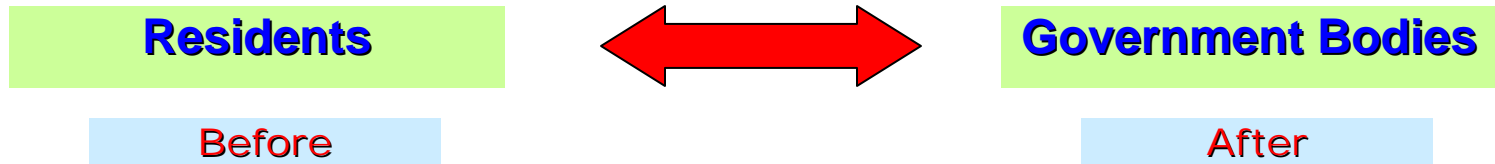
Definition of DMCS

2. Target Infrastructure



- Definition of DMCS
- 3. Target Functions

Save people's life & property using a DMCS



Collecting

- Meteorological information (data, image)
- Hydrological information (data, image)
- Site information (image), etc.

Dissemination

- Weather conditions (voice, data)
- Community services/messages
- Administrative messages/command, etc.

Sharing

- Meteorological information (data, image)
- Hydrological information (data, image)
- Administrative messages/command, etc.



Collecting

- Stricken site information (voice, image)
- Refugees conditions (voice, image), etc.

Dissemination

- Evacuation order (voice data, image)
- Disaster information (voice, data, image)
- Administrative messages/command (voice, data), etc.

Sharing

- Disaster information (voice, data, image)
- Refugees conditions (voice, data, image)
- Administrative messages/command (voice, data), etc.

- **Definition of DMCS**
- **4. Target operations**

- **Before**

- (1) Community services (chime service, event announcement etc.)
- (2) Telemetry system for monitoring water-level, rainfall and image data
- (3) Preparatory works for any kind of disaster

- **During**

- (1) Quick and exact collecting of disaster information
- (2) Distributing command and disaster information
- (3) Sharing disaster information on real time with image data at site
- (4) Rescue operations for residents

- **After**

- (1) Distributing appropriate information to evacuees (foods delivery etc.)
- (2) Relief operations and reconstruction works

DMCS, Whose Responsibility?

- Setting up of Nation wide Disaster Management Communication System (DMCS) Net Work is the responsibility of the National Disaster Risk Management (NDRM).
- Telecom Service providers shall be responsible to provide Reliable Telecommunications Backbone Net Works.

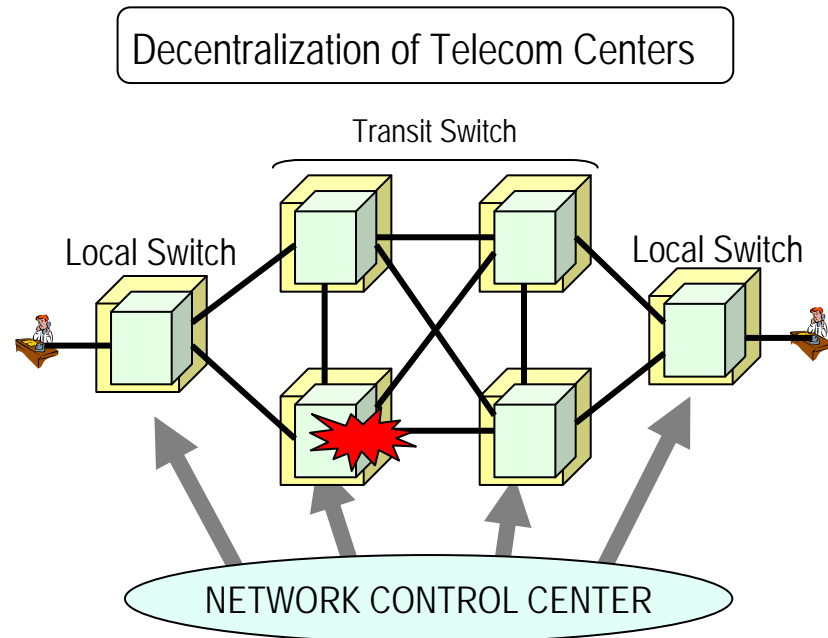
Telecom Disaster Risk Management

Context

1. Provide Reliable Telecom Backbone Network in the Kingdom.
2. Scope of Work
3. Bhutan Telecom and Disaster Counter Measure Policies.
 - Before the Disaster (Preparedness)
 - During the Disaster(Response)
 - After the Disaster (Rehabilitation)
 - Scope of Work
 - Annex

1.0 Reliability Enhancement of Telecommunications Networks














- ◆ Install multi-routed and looped Transmission Lines as well as distributed main Transit Switches so as to prevent disruption of telecommunications.
- ◆ In order to maintain and improve its services, maintain round-the-clock network monitoring and control.

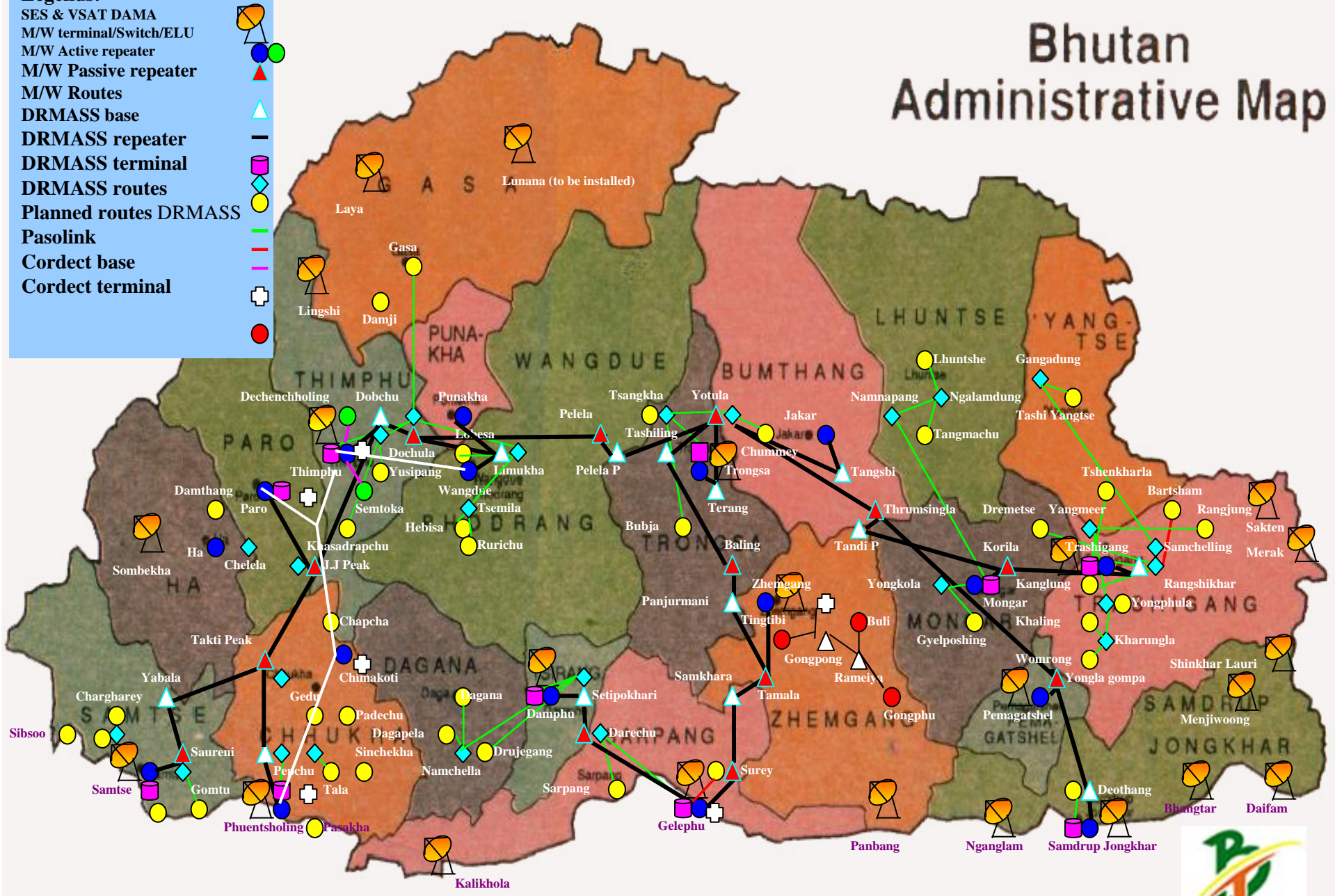


24-hour monitoring and control of the statuses of telecom facilities and network traffic volumes

Bhutan Administrative Map

Legends:-

- SES & VSAT DAMA 
- M/W terminal/Switch/ELU 
- M/W Active repeater 
- M/W Passive repeater 
- M/W Routes 
- DRMASS base 
- DRMASS repeater 
- DRMASS terminal 
- DRMASS routes 
- Planned routes DRMASS 
- Pasolink 
- Corduct base 
- Corduct terminal 



BHUTAN TELECOMMUNICATIONS NETWORK

2.0 Disaster Countermeasure Policies

Disaster Countermeasures on the following Principles to construct Disaster-Resistant Networks, and in an event of disaster, takes Prompt Actions to secure immediate Communications, which are to be followed by Full-fledged Disaster Recovery Activities.

<p>Normal times</p>	<p>Enhance Network Reliability</p>	<ul style="list-style-type: none"> ● Avoid interruptions of communications to minimum by making Networks Reliable. ● Carry out Counter-Disaster Measures of communication facilities and equipment constituting the Network. ● Monitor/Control Networks and Traffics around-the-clock and immediately respond to any abnormal condition.
<p>Disaster times</p>	<p>Makeshift Recovery of Services</p>	<ul style="list-style-type: none"> ● Take Prompt Actions to recover Immediate Communications and later shift to full-fledged Recovery Procedures. <ul style="list-style-type: none"> ▪ When interrupted, secure Minimum Communication Services by such means as installation of Free Public Telephones via Satellite. ▪ During power outage, supply Power through such means as Storage Battery, Engine and Mobile Power Source Vehicle. ● Provide means of Personal Safety Confirmation
	<p>Secure Essential Communications</p>	<ul style="list-style-type: none"> ● During Congestion due to rushing inquiries, control Ordinary Call Traffic and give Priority to Essential Communications, etc. to pass through. <ul style="list-style-type: none"> ▪ Priority given to Emergency Dials (Dial 110, 111, 112, 113, 140) and other Calls of Disaster Relief Agencies ▪ Guide Ordinary Calls to Safety Confirmation Services via Public Relation and other means

Normal time Before the disaster (Preparedness)

- Enhance the Network reliability with multi-node back up networks.
- Build Disaster Resistant Telecom infrastructures.
- Maintain adequate Makeshift Telecom equipment inventories at the Center and the regional level.
- Create Disaster Response Mechanism at the Center and the regional level.
- Provision NEPS (National Emergency Preference Scheme) Telephone call priority.

During the Disaster Time.(Response)

- Deploy Makeshift Telecom equipments
- Take Prompt action to recover immediate communications to save lives.
- When interrupted, secure minimum Communication Services by such means of Public Phone Services via Satellite.
- Ensure NEPS (National Emergency Preference Scheme) facilities are given Priority to Essential communications.

After the Disaster (Re-habilitation)

- Ensure all Makeshift Communication arrangements are recovered to full-fledged networks.

Recommendations

- Provision National Emergency Preference Scheme (NEPS).
- Makeshift equipment should be kept ready for immediate deployment.
- Regional and international information sharing to deal with disaster situations.
- Build Area level ERT Team for immediate relief operation.
- Smoke detectors & fire safety equipments at all Telecom exchange complexes installed.
- Siren and regular mock drill exercises be enforced to familiarize staffs with safety procedures.
- Fire hydrants installed in exchange complex.

Who are preferential users?

- Emergency services by local authorities, including police, fire services, etc.
- Public warning systems
- Diplomatic and other vital governmental purposes
- State security purposes including customs and immigration
- Telecommunications service providers, for maintaining their service provision to other essential users
- Public utilities including energy, water supplies, etc.
- Medical services
- Air and sea rescue
- Military purposes

What are essential features ?

- Priority dial tone
- Priority Call set-up
- Priority Queuing scheme
- Priority in time of restrictive network management controls

ITU recommendation :

‘Essential users should be able to use their normal telecommunication equipments in peace or crisis’

ANNEX-1

Makeshift Equipment for Telecom Disaster Relief

- VSAT
- Mini-links Radio set
- Mobile Diesel Generator set
- Emergency Mobile Van
- Satellite Phones
- WLL XBS, FRS, CPM
- HF / UHF Handsets.

CONTINUED

- Portable Generator Set
- Portable Rectifier
- Solar Panels & SCR
- 12 Battery
- Mobile COW
- BTS
- Vehicles

ANNEX-II

Disaster Recovery Equipment Spares

- Switching Equipment spare cards.
- B-Mobile Equipment spare cards
- Transmission spare cards
- Druknet spare cards.
- Power plants spares
- OSP Line store
- WLL Spares

Conclusion

DO NOT WAIT FOR THE DISASTER TO
HAPPEN.

WHEN IT DOES, IT COMES WITHOUT
WARNING

ANYWHERE

ANYTIME

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