



Science and Technology in Security and Disaster Management in the Republic of Korea

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Topography and Climate

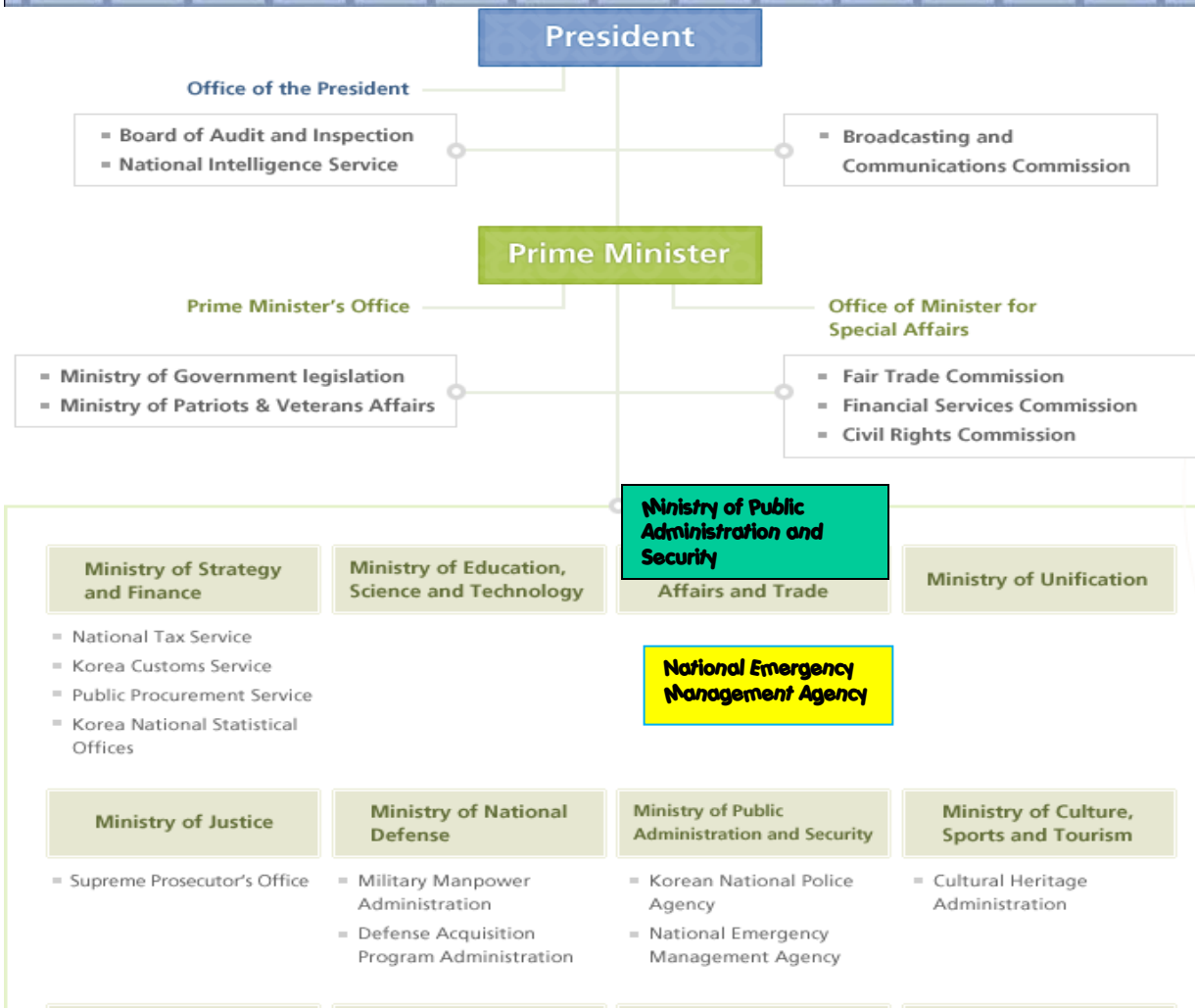
- **The Korean peninsula faces the Yellow Sea and the Chinese continent on its west, the East Sea and the Japanese archipelago on its east and the South China Sea and the Pacific Ocean on its south.**
- **Korea has a temperate climate with four distinct seasons characterized by many arid days in spring, substantial rain in summer and much snow in winter.**



Status and Characteristics of Disasters

- **Types of natural disasters include torrential rain, storms, typhoons and heavy snow.**
- **Torrential rain, typhoons and storms** account for 84% of the total damage.
- **The average number of annual natural disasters hitting Korea is placed at seven, with annual average property loss and death toll standing at \$1.1 billion and 129 deaths, respectively.**
- **Korea spends about \$2 billion for rehabilitation of devastated areas per year.**

Government Organization Structure for Security and Disaster Management



➤ **NEMA**, established on June 2004, is in charge of **natural & man-made disasters**.

➤ **MOPAS**, established on March 2006, is in charge of **security and critical infra-structure protection**. MOPAS is going to reinforce the responsibility on citizen's safety and disaster prevention by strengthening collective management and control for the disasters and security.

Early Warning System

1) CBS (Cell Broadcasting Service) Phone Disaster Notification Broadcasting System

System overview

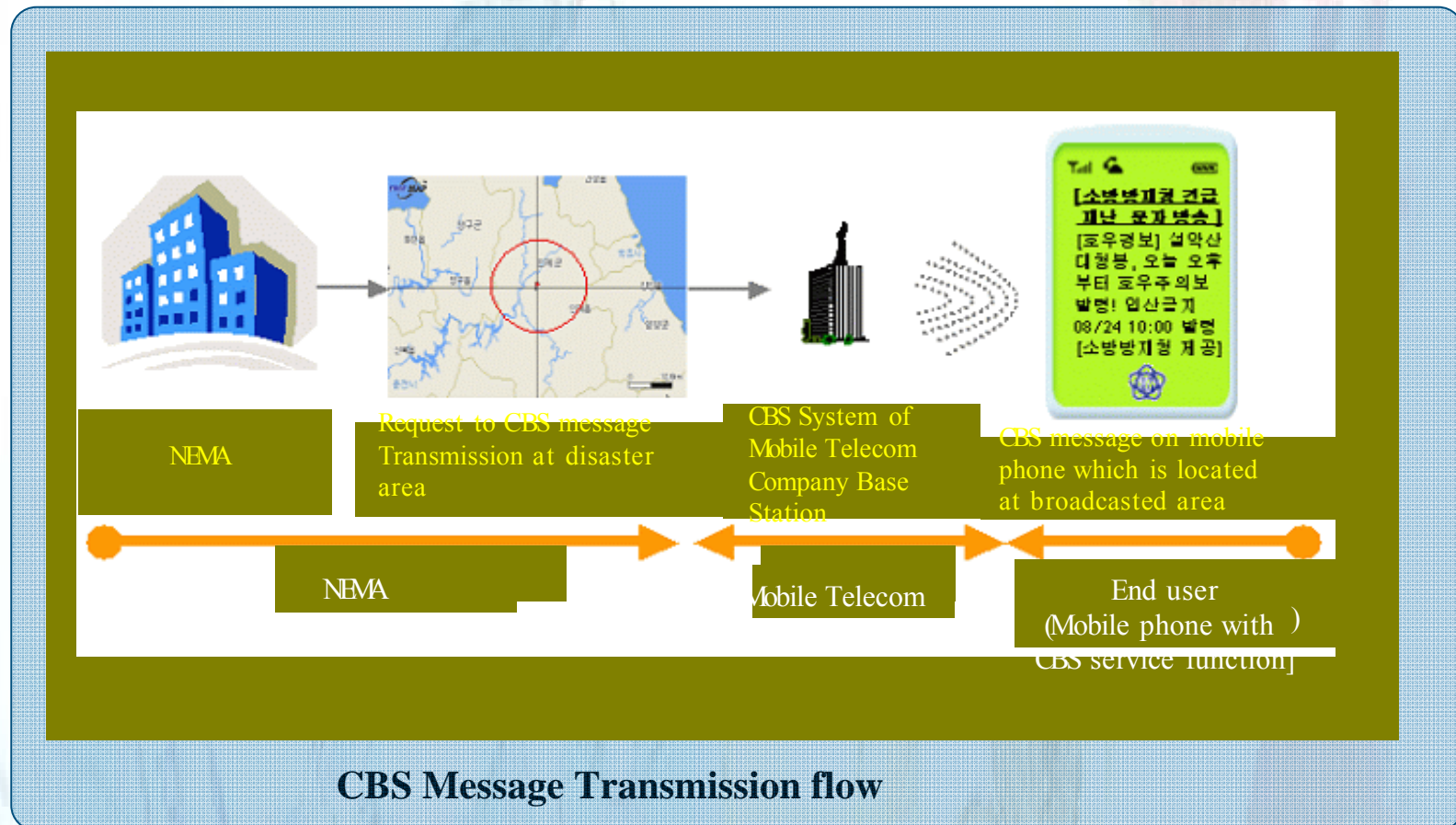
- **The mobile communication technology** that broadcast disaster message to mobile-phone users at Base Station Transceiver Subsystem, who have special receivable ID.
- Disaster message transmission to nation-wide or specific area resident users **simultaneously at once**.
 - ☐ CBS (Cell Broadcasting Service)

Servicing Status

- '04. Dec. Pilot project starts at Gyeonggi/Gangwon (2.6M Residents)
- '05. Feb. Expand service area to Ulsan City, Kyungsang North Provinces (3.8 M Residents)
- '05. May implementation of nation-wide service (21M Residents)

Early Warning System

□ System Structure and Message Flow



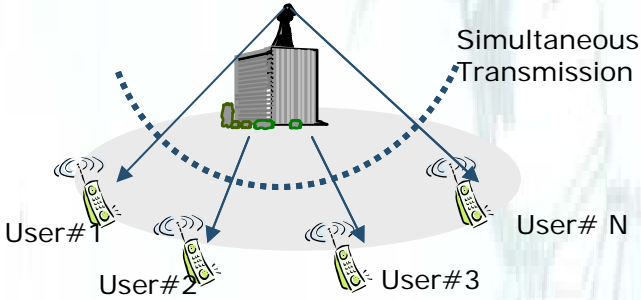
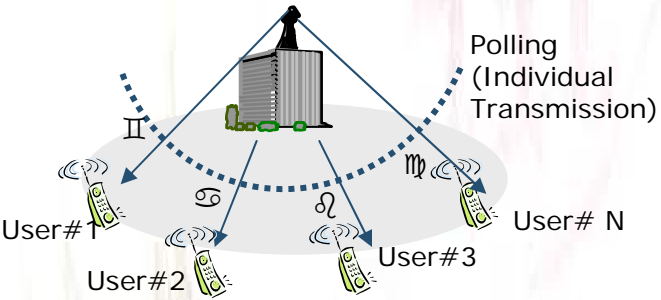
Early Warning System

□ CBS Structure and Weakness

Strength	Nation-Wide	<ul style="list-style-type: none">Information reception available by CBS module equipped without any additional hard wares (Nation-wide information broadcasting available)
	Point to Multi	<ul style="list-style-type: none">By broadcasting characteristics, multi-users information transmission available at a time (Suitable for real-time warning services)
	Economy	<ul style="list-style-type: none">No dependent on number of user and low cost to build system. (No relation b/w CBS cost & subscribed user)
	Region-Based	<ul style="list-style-type: none">Disaster information suitable to the residents' areas and situationGroup message transmission function. (Grouping of frequent disaster outbreak areas)
	Convenience	<ul style="list-style-type: none">User can select/confirm/delete any disaster information as convenience.Easy 'Call-Back' function available by just press "Send" button, if user want.
Weakness	Terminal Oriented	<ul style="list-style-type: none">Without mobile terminal or CBS module, unavailable for information broadcasted.If terminal off, No any information available even if terminal have CBS module.
	Reception Rate	<ul style="list-style-type: none">Unavailable of information reception in radio-dark areasNo confirming method of disaster information reception

Early Warning System

Comparison of CBS and SMS

CBS (Cell Broadcasting Service)	SMS (Short Messaging Service)
	
<ul style="list-style-type: none"> • Point to Multi-Point (Simultaneous Multi Casting) 	<ul style="list-style-type: none"> • Point to Point (Handshake symbols)
<ul style="list-style-type: none"> • Real time service to all users located at specified base station • Very low transmission cost • No database of phone number and to select transmission area from one base station area to nation wide. • Max. 230 characters information per transmission. 	<ul style="list-style-type: none"> • Minuets or hours transmission time required depend on number or service user and real timer service impossible if service user more than 300,000. • Transmission cost high (25 or 30 won per person) • Database of phone number required • Max. 40 characters information per transmission.

Early Warning System

The contents in case of Tsunami alarming

Message From NEMS.

In (MM) : (DD), (HH) : (MM), as there was a earthquake or Richter () at the coast of Japan, the tsunami damage would be expected at (). All residents and visitors should stop all activities at the specific area and immediately escape to hilly sides or solid buildings while keeping listening special weather reports from public broadcasting, etc. Do not return to coast area before confirming that the situation would be safe and clear.

- Emergent situation : Call 119

Early Warning System

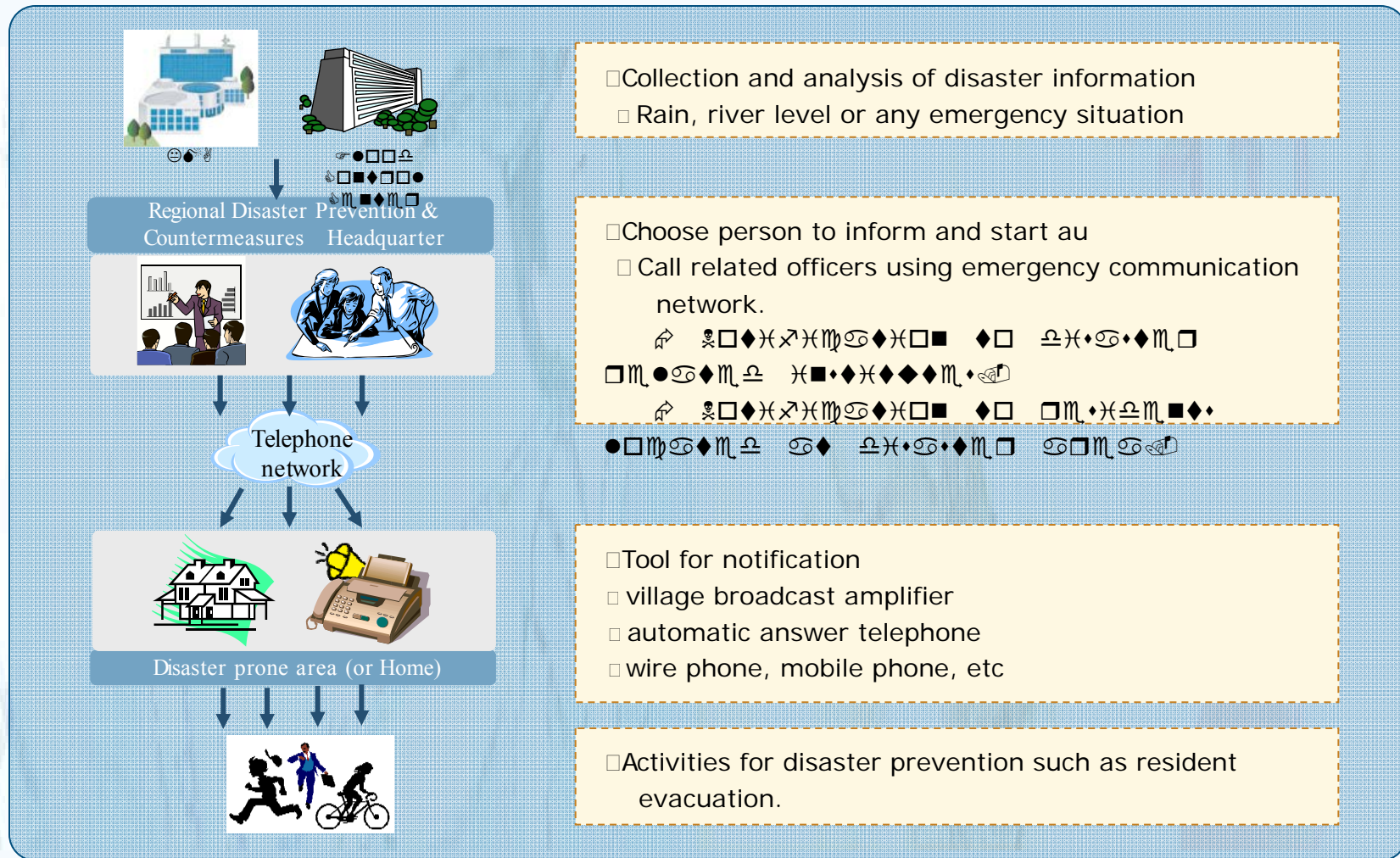
2) Automatic Verbal Notification System

System Overview

- ✧ Real time propagation of message of disaster situation with “**Automatic Verbal Notification Equipment**” located at Regional Disaster Prevention & Countermeasures Headquarters, When flood, typhoon or any disaster occurs or are expected.
 - By wire telephone, mobile phone, village broadcast amplifier and any available communication tool, person in charge of regional offices (eup, myun, dong), drainage pump chapter, each administrative offices related to disaster, etc.
 - Minimize of loss in lives and properties by construction of fast shelter system using immediate disaster notification to residents located at dangerous area and coast, etc.
- ✧ Management of database of 550,000 people such as civil officer, residents

Early Warning System

System organization & Management streamlines



Early Warning System

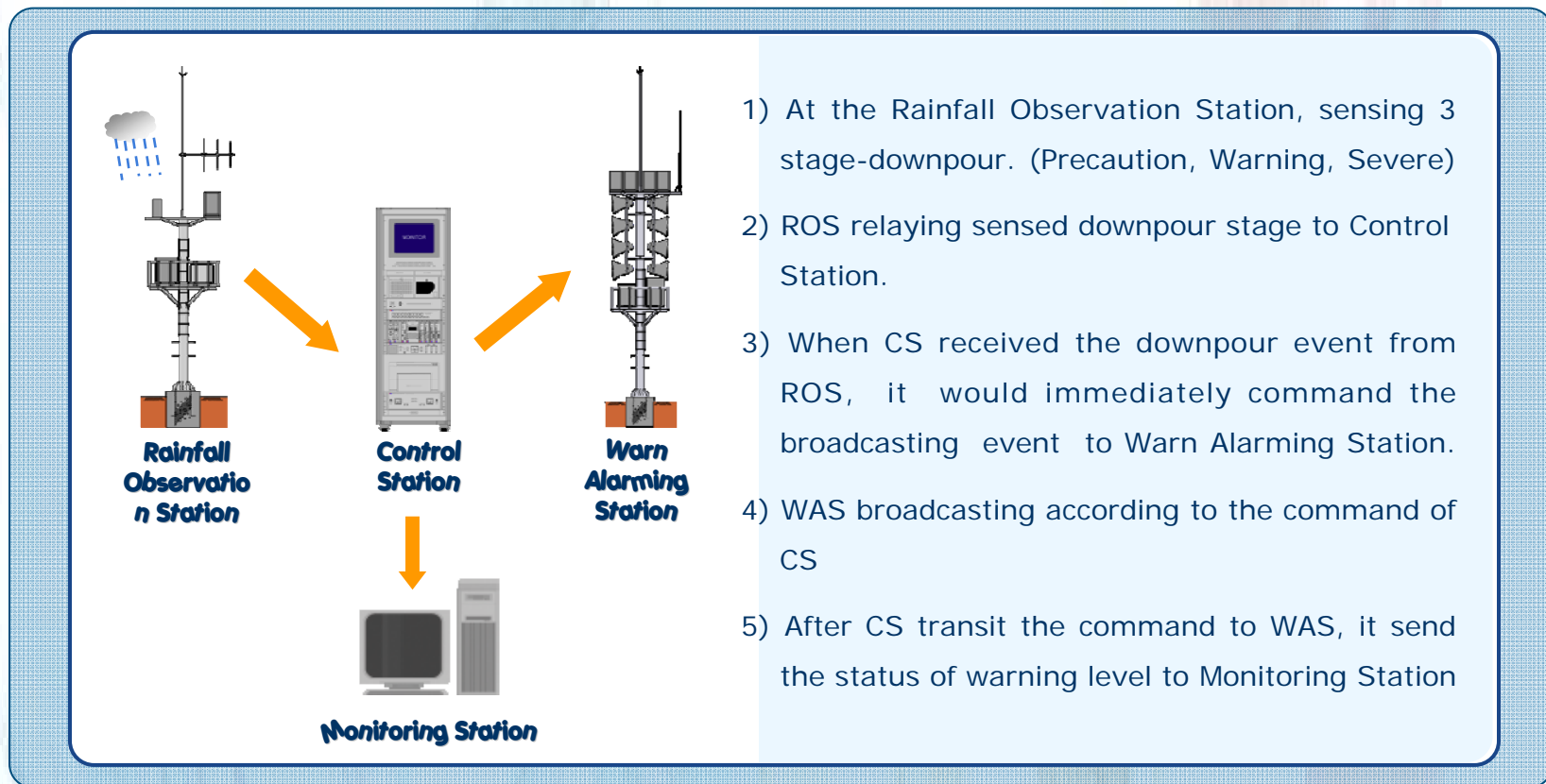
3) Automatic Rainfall Warning System

System Overview

- Establishing **automatic rainfall (water leveling)** observing station at the upper and middle area of mountain valley, as well as automatic warning system at the lower area of it, and the automatic remote control/observing station at the local Disaster Prevention & Countermeasures Headquarters and local administrative offices.
- ✂ Automatically observing the rain falling status at the upper/middle areas, and automatically performing the warning alarming and disaster information broadcasting at the lower areas. Those series of action flows should be observed and controlled by the remote control station manually and/or automatically.
- ✂ At '96~'05 period, 148 sites have been already established and operated at the valleys, and downy side of rivers, national parks, and at '05~'09 period, planned to establish additional 113 sites.

Early Warning System

System organization & Management streamlines



Early Warning System

Snap shots



< Rainfall Observation Station >



< Warn Alarming Station >



< Control Station >



< Monitoring Station >

Early Warning System

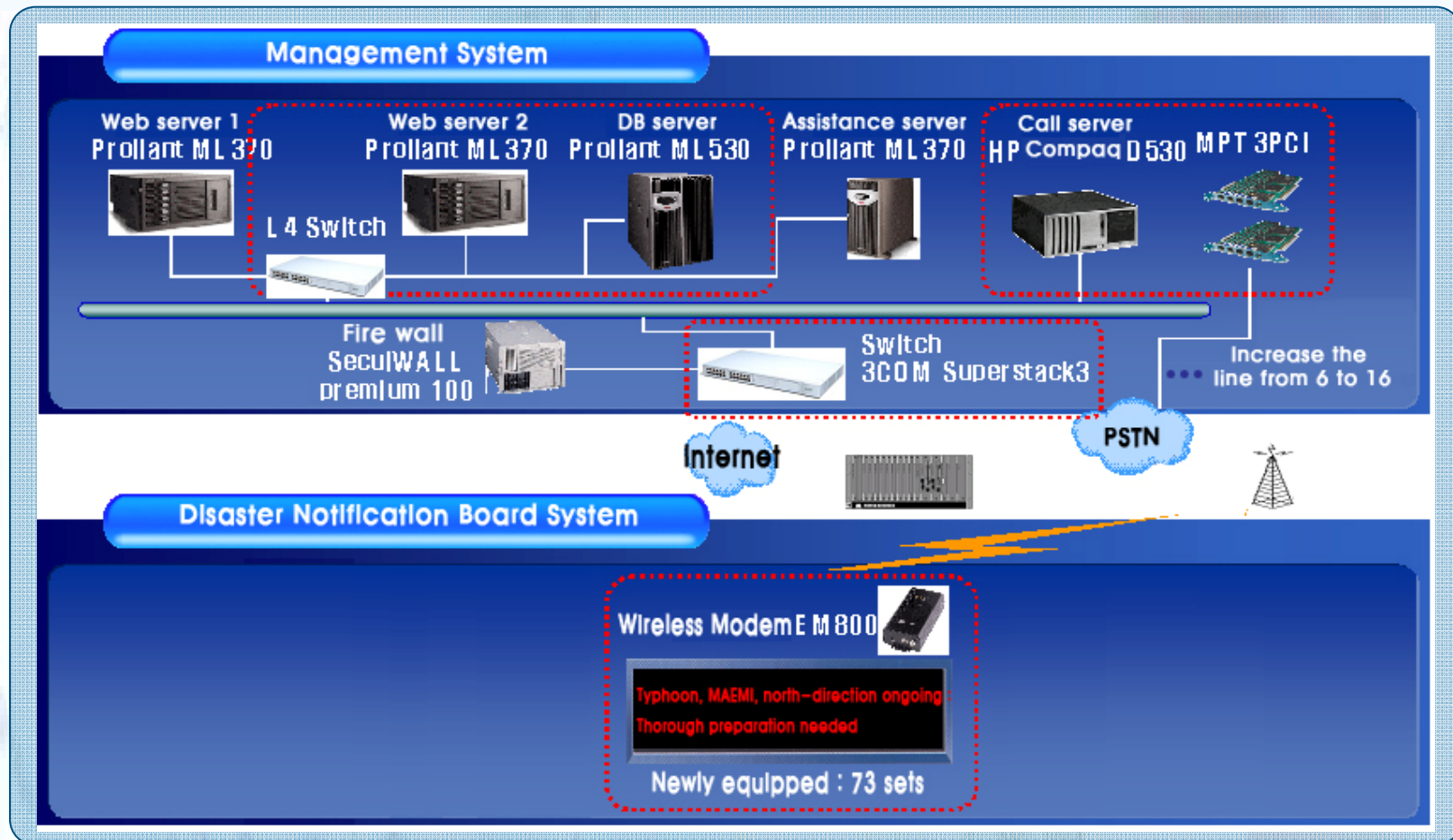
4) Disaster Notification Board System

System Overview

- Preparing of immediate response system toward disaster by notifying and broadcasting rapidly the disaster situation through blowing siren and board messaging, at the normal times, performing national propagation of awareness toward disaster, etc.
- ✦ 299 sites of system establishment and management all throughout of the nation such as coastal beaches, public parks around lower river areas, etc.

Early Warning System

System organization & Management streamlines



Early Warning System

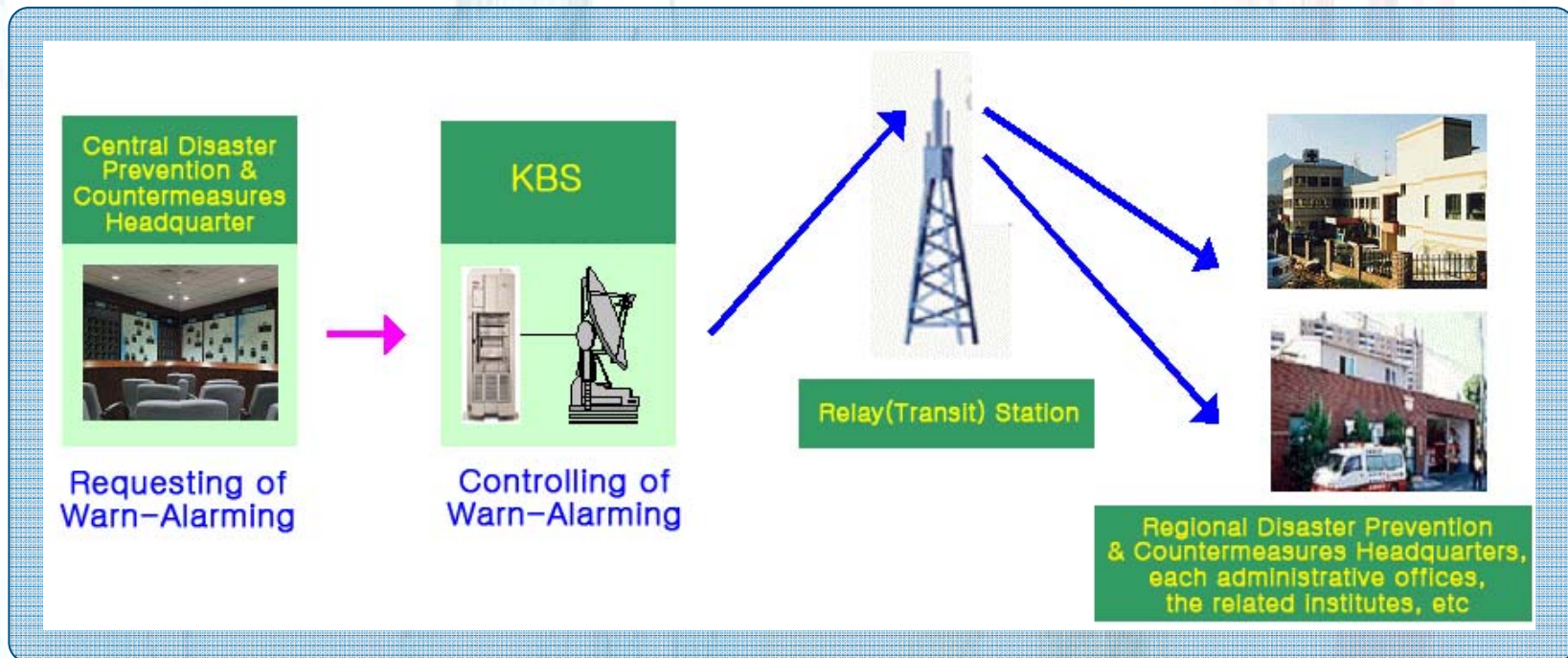
5) TV Disaster Warning Broadcasting System

System Overview

- ✧ Broadcasting the urgent disaster situation **in the form of screen, sound, or screen messages by forcibly automatic turning on TV or changing to disaster warn channel** with volume-up through the Broadcasting station's casting-equipment when out breaking of urgent disaster information that could not be easy to transmit this situation at such as deep night, etc.
- ✧ Upon establishing TV Disaster Warning Broadcasting Receiver at totally 3,997 places such as central, regional Disaster Prevention & Countermeasures Headquarters, each administrative offices, the related institutes, etc, Korea Broadcasting Systems (KBS-1TV) would broadcast the specific disaster information ones.

Early Warning System

System Management streamlines



Early Warning System

Example of TV Screen



Flood Alarm has been issued from 22:00 today at the lower course of a NAKDONG River, All residents and visitors must take care of weather situation.

Thank you

