ICT Disaster Symposium in Sendai, Japan.

Emergency Disaster Information and One-Segment Broadcasting System

March 16, 2012

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Emergency Disaster Information and One-Segment Broadcasting

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1. ICT status at the East Japan Great Earthquake
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   - effective in use for emergency weather and disaster broadcasting -
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1. ICT status at the East Japan Great Earthquake

1-1. Major Damage in ICT

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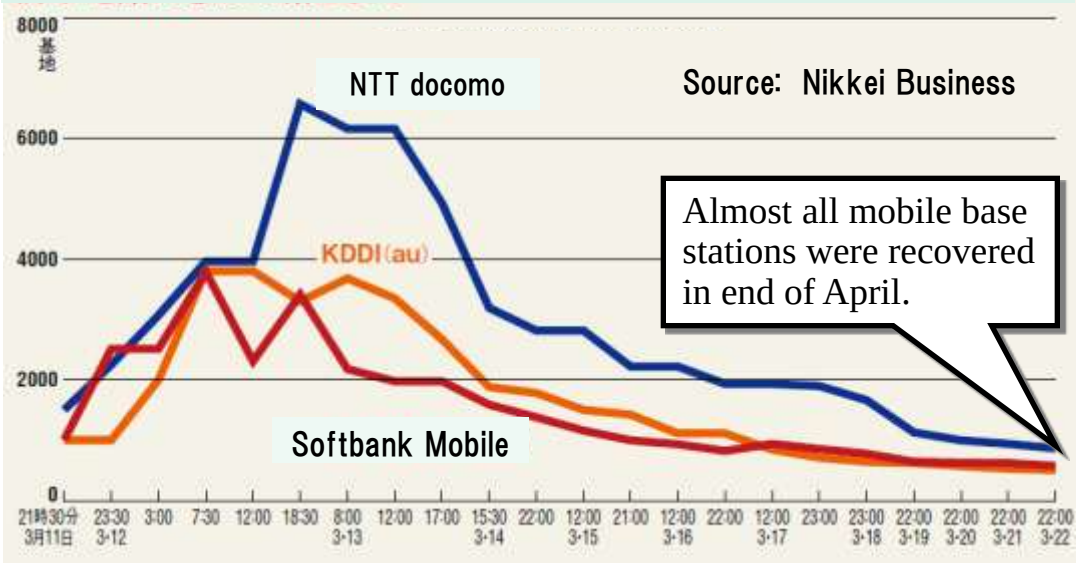
1 Fixed-line services

- At its peak, approximately one million lines were disconnected on March 13, 2011.
- At its peak, approximately 500,000 FLET'S Hikari (FTTH services) lines were disconnected on March 13, 2011.

2 Mobile phone services

- The peak number of mobile base stations out of service was approximately 14,800 on March 12, 2011.

The number of mobile base stations out of service



3 Broadcast infrastructure

- The peak number of television relay stations out of operation was 120 on March 12, 2011.

* The peak number of radio relay stations out of operation was one in Iwate prefecture and one in Fukushima prefecture on March 12, 2011. Operation has since been restored to all radio relay stations, and all AM and FM radio broadcasts are operating as normal.

1-2. The East Japan Great Earthquake

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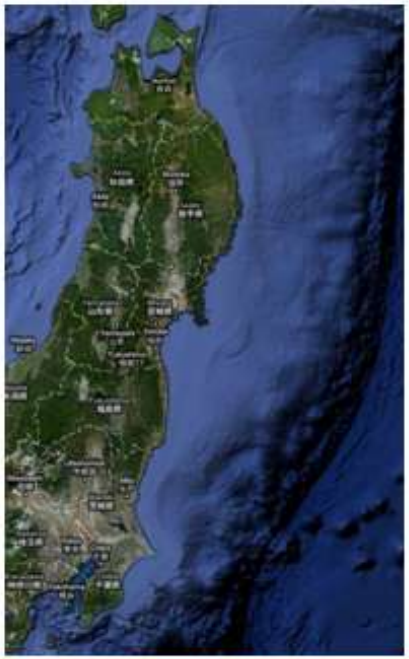
TV Broadcasting

11 March 2011 14:46 JST



- **Broadcasting played an important role to disseminate the early warnings and report the mid- and post-disaster information.**
- **One-Seg could be effective tools to disseminate the tsunami warning especially in the field.**

Scale & Location
Magnitude: 9.0
Hypocenter: 130km off the Pacific coast of Tohoku region, 24km depth
Tsunami: Presumption 20 meters or more

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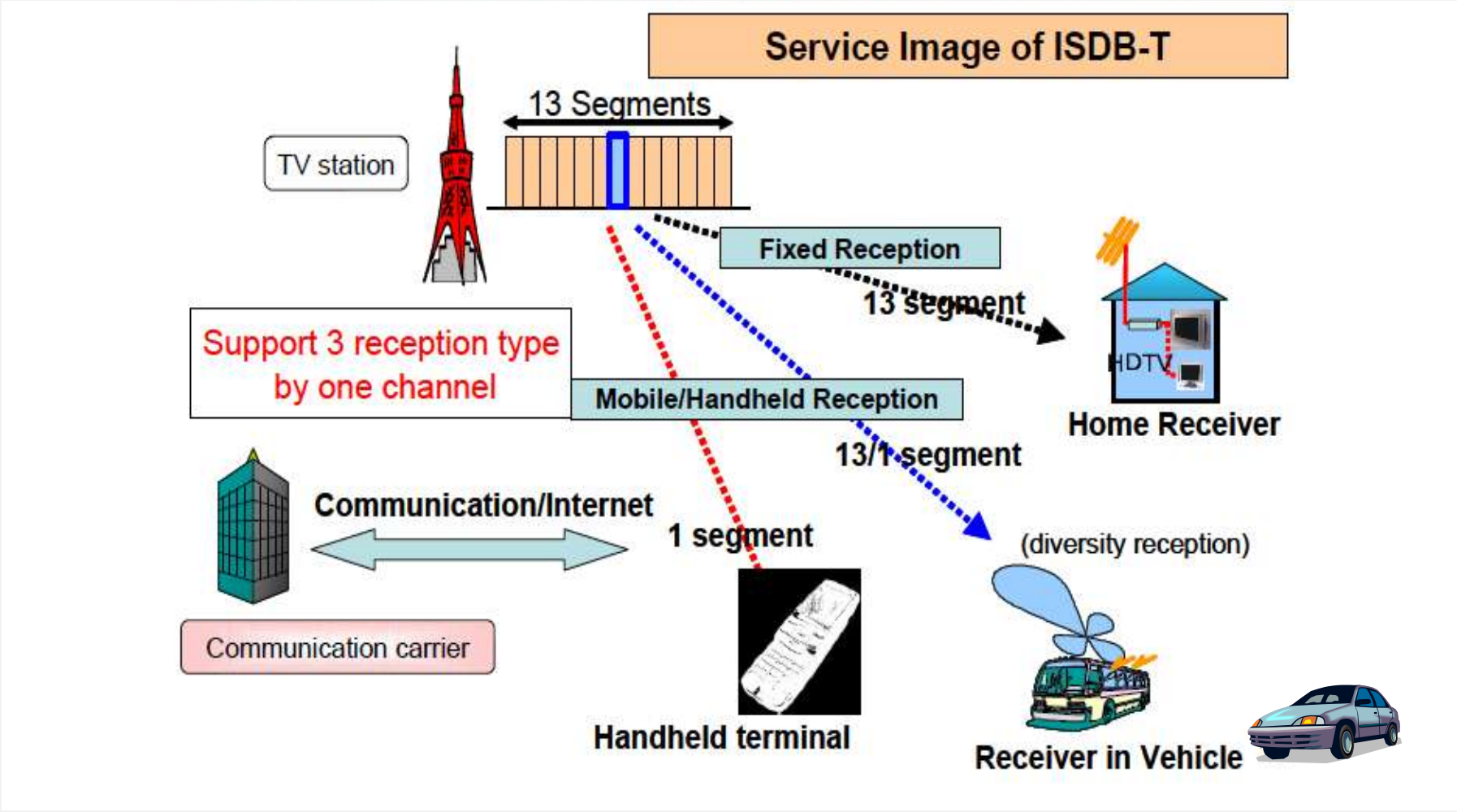
Broadcasting Image in Japan

Each channel has 13 segments which includes one-segment Broadcasting for Mobile screens.



1-4. Damage and Effect of the Great Earthquake

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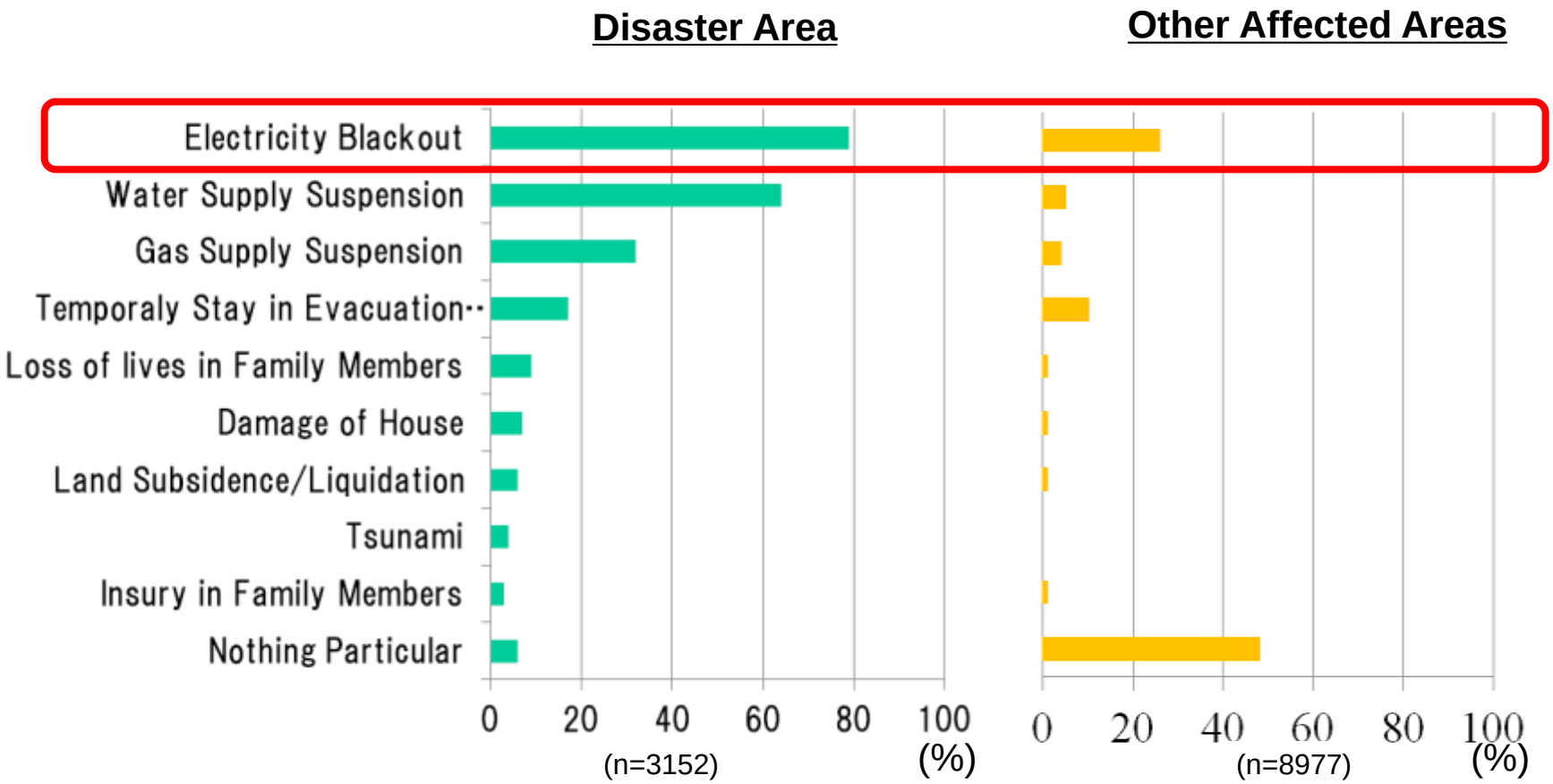
What type of damage or effect did you suffer by the earthquake?
→ Most people suffered electricity Blackout in the disaster area



Source: The NHK Broadcasting Culture Research Institute (Sep 2011)

1-5. Information source immediately after the earthquake

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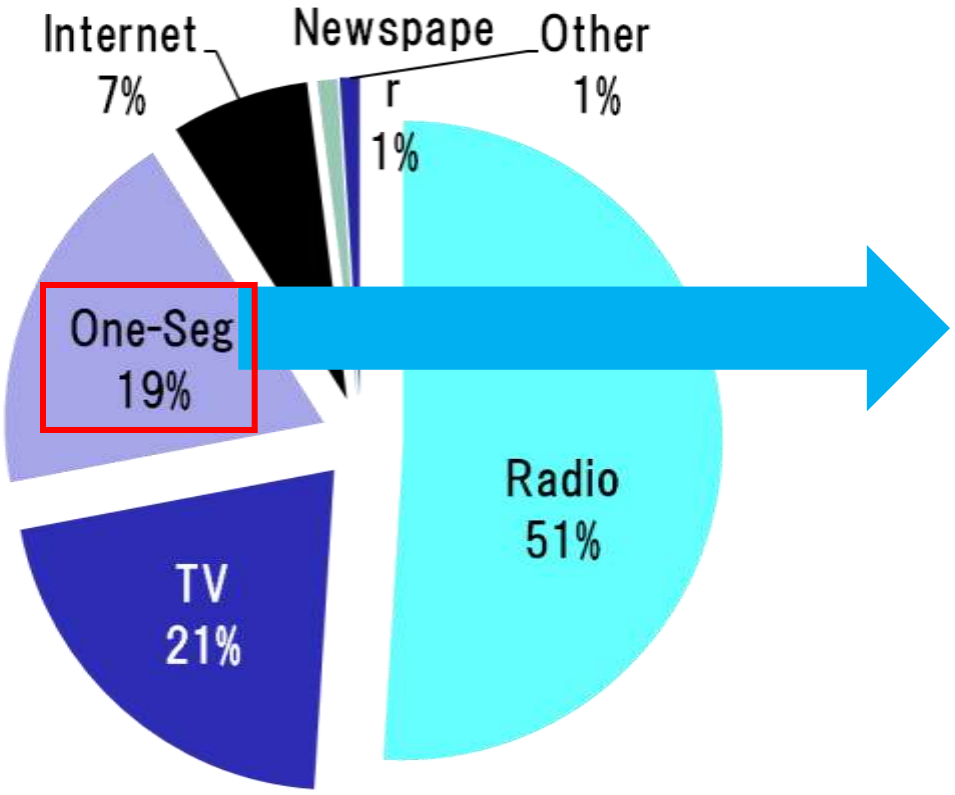
What media did you access immediately after the earth quake?
→ Half of the people listened to radio
→ Remaining half watched One-Seg or TV



Receivers with battery power supply were very effective in this earthquake

Deliver texts, sounds, and images

There were large number of answer that they initially tried to turn on TV but there were blackout and then tried to turn on One-Seg or Radio

Source: The NHK Broadcasting Culture Research Institute (Sep 2011)

1-6. Policemen saved 40 lives with one-seg mobile TV alarm!

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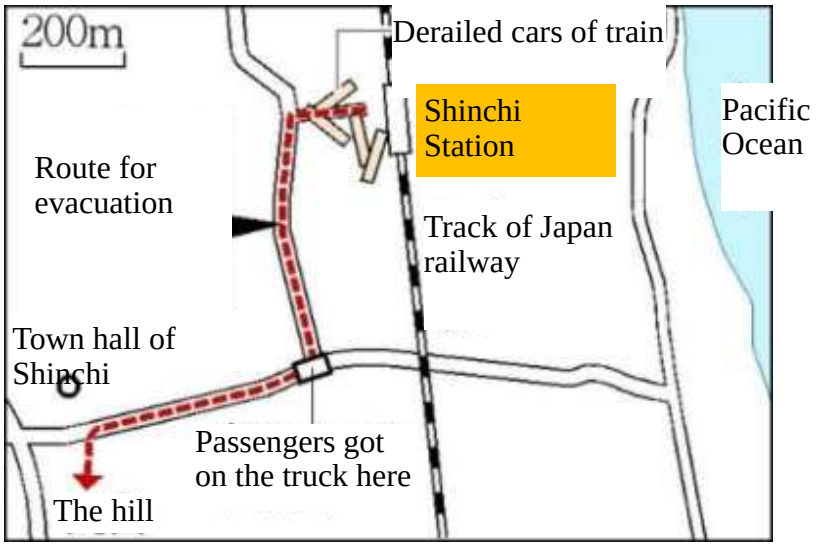
Two new policemen saved 40 lives from the train with the tsunami warning alarm from mobile TV(one-seg) right after the earthquake occurred at 14:46 on March 11, 2011.

They got a tsunami warning alarm from the passengers mobile phone with TV when checking if everyone is fine in the train. They quickly decided to lead the 40 passengers to the hill to avoid the disaster of tsunami. All passengers were safely evacuated from the tsunami area before the tsunami struck the train.



The cars of train derailed off the track by huge tsunami waves. (March 12, 2011)

(Summary from Yomiuri Shimbun(Japanese major national news paper), March 29, 2011)

1-7. One-seg Mobile TV Saved Many Lives

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A huge earthquake struck on March 11 in the north-east area of Japan. Right after the end of the violent shakes caused by the earthquake, Mr. Takahashi, Senior Managing Director of TOYO KNIFE, an industrial cutlery company located in Miyagino district, Sendai City, immediately turned on the one-seg TV function on his mobile phone in his office, to which the power supply was cut off.

He got an emergency warning alarm for a tsunami on his one-seg TV (mobile phone). Regrettably his office was located very near the port (about 500m from Sendai-Shiogama Port), so he and other staff did not have much time to evacuate, but 100 people managed to rush to a shelter on a hill.

By the time they arrived at the shelter (Tagajyo Public Cultural Center) at 3:30 pm, the TOYO KNIFE office and factory had been completely destroyed by the long-lasting, huge tsunami.

Mr. Takahashi said " We couldn't watch TV because of the power cut, but we could get information on the disaster quickly from our one-seg TVs."

Note: the one-seg TV function on a mobile phone is powered by the phone's battery

Miyagino district, Sendai City (after the huge tsunami waves)

(Summary from Sankei Shimbun (major Japanese national newspaper), June 24, 2011)

2. Emergency Weather and Disaster Information System in Japan

2-1. Example Flow of Emergency Warning Broadcasting System (EWBS) Operation in JAPAN

Japan Meteorological Agency (JMA)

TSUNAMI Alert

EWBS

Broadcasting station

Transmitting tower

"Emergency Warning Broadcast"

"Tsunami Alert" Television

"Tsunami Alert" OneSeg /Radio

In Japan, EWBS is operated under three conditions:

- The precaution declaration of the large-scale earthquake
- Tsunami alert.
- The local governor's request for an emergency warning broadcast

2-2. Information Gathering System in Japan

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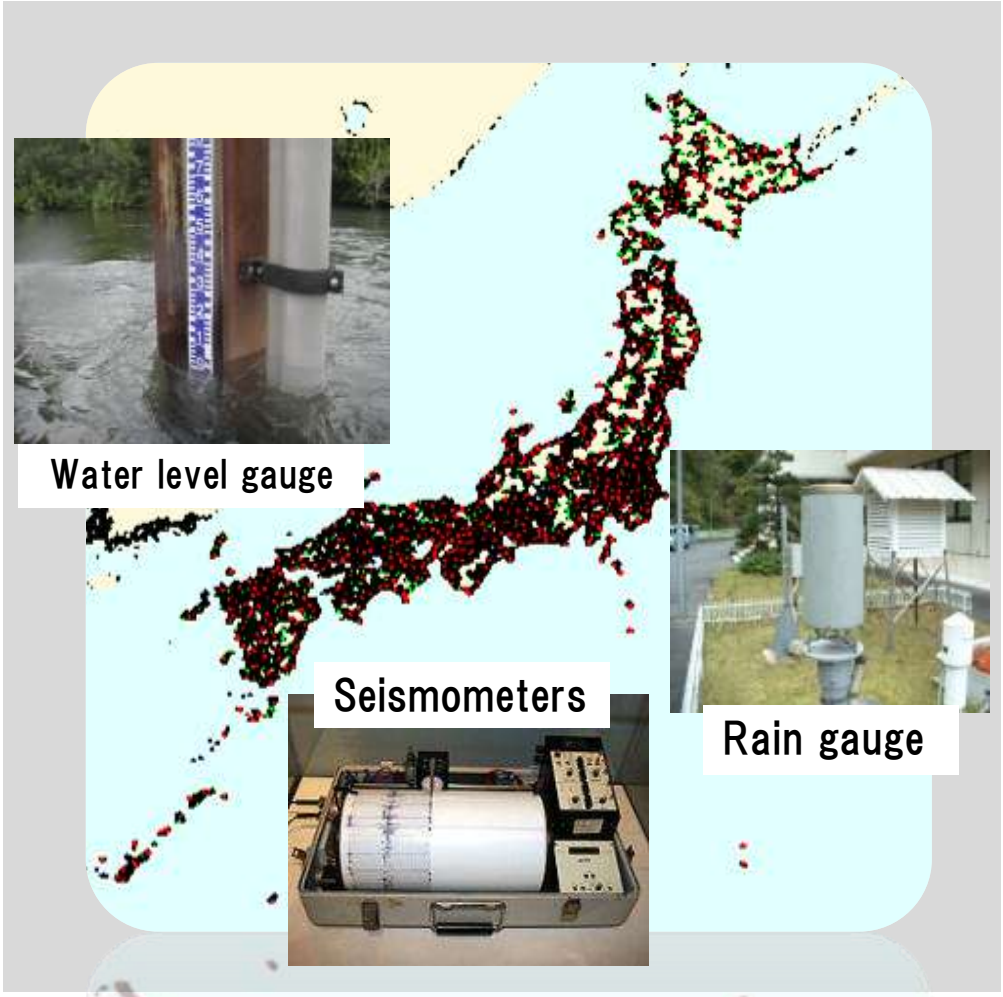
- The Japanese government (Japan Meteorological Agency) aggregates data from sensors around Japan. (ex. 5,000+ Seismometers)
- The collected data are used in various fields such as
  - Weather Information
  - Earthquake early warning
  - Tsunami warning and advisory etc.



2-3. Services of Weather Forecast Companies

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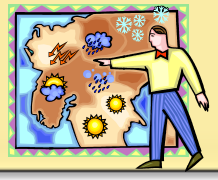
Japan Meteorological Agency (JMA)

Japan Meteorological Business Support Center

Data observed by other companies or organizations

Authorized Weather Forecast Companies



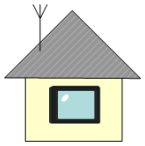
Equipment for data reception
Systems of data analysis, forecast and delivery
Certified weather forecaster

Original forecast
Comments for broadcasting
Weatherman
Advisory staff

JMA forecast
Original forecast
etc

TV station
Radio station
Newspaper

Residents



Corporate Customers

Traffic companies,
Construction companies,
Grocery stores and retail stores,
Tourism companies,
Medical , Pharmaceutical, Health, etc.

3. Screen Layout Broadcasting System (Contents Management System)

- effective in use for emergency weather and disaster broadcasting -

3-1. Multiple Information broadcasting system (screen image)

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CMS (Contents Management System)

- Weather Forecast
- News Flash
- Earthquake, Heavy rain,
- Traffic information

- Announcement from Municipal offices, Schools and Hospitals
- Local Commercials

3-2. Overview of CMS(Contents Management System)

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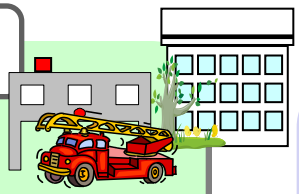
Disaster, Weather

- Traffic information
- Weather bulletin
- Disasters information (earthquake, typhoon, and tsunami etc)・・・・

Administration



- Information from cities, towns and villages
- Fire information from fire departments, etc・・・..

School, Hospital

- Information from schools hospitals, shopping centers fixed point camera images

Broadcasting Recognition to the information

Contents Management System

Distribution to each media

Data Broadcast & One-seg

Emergency broadcasting (interrupt programming)

Full Screen Still Image or Overlay telop with voice

Automatic broadcasting operation

Web-Page linkage

3-3. Flow of information for CMS(Contents Management System)

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Register news
Fire St. Police St., Municipal office etc.

Input PC

- Input text form from dedicated web site <Internet Explores>
- Remote registration and input the news
- Emergency broadcast as interruption
- Approval
- Sound recording

External organization
Information Center

Weather & Traffic information…

Internet

Output

Output

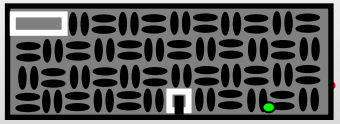
Broadcast Station, Service Provider etc.

Broadcast Program

Video & Audio

Play out system

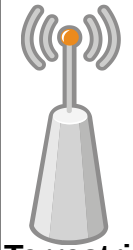
Schedule Editor / Web server



CMS

- Schedule Editor
- User's administration
- Program administration
- Screen layout setting

Satellite



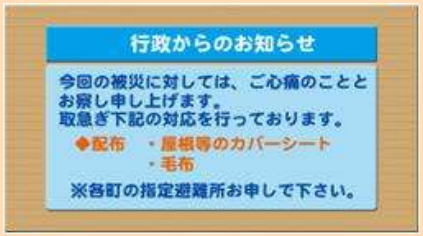
Terrestrial TV

distribution

CATV

Internet

Home



Municipal info., etc

Local Commercials

Weather, Emergency Disaster

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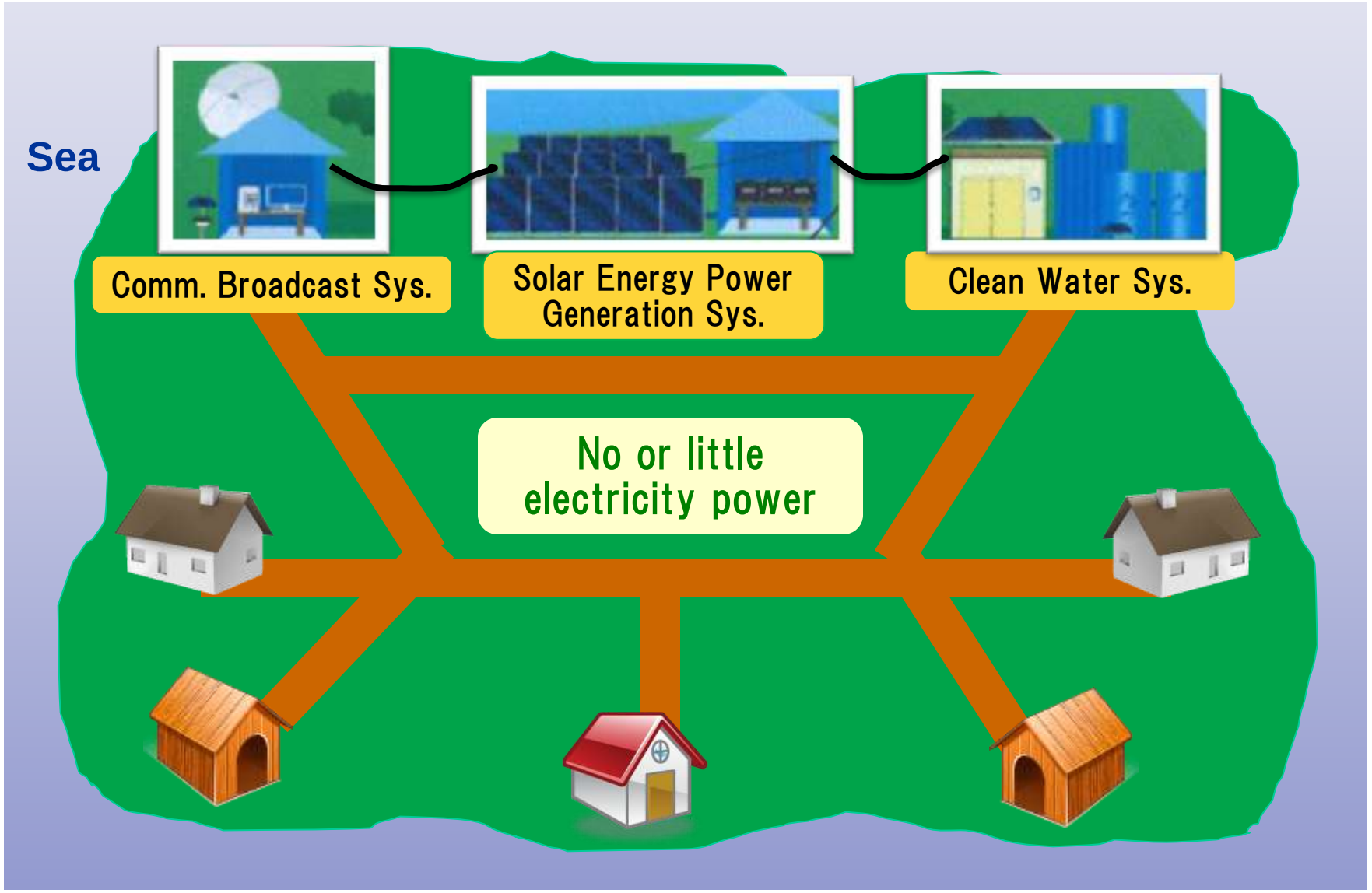
4. Proposal for rural areas

4-1. Package Solutions for Rural Area



4-2. One-Segment System for Rural Areas

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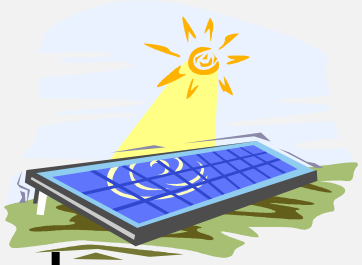
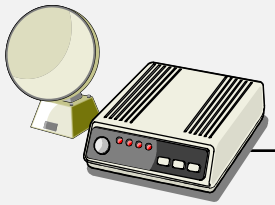
Reproduced One Segment from Public Broadcasting

Broadcast Satellite



Power supply from Solar Panel and Batteries

Antenna



PAL/NTSC

Analog TV receiver

Digital Broadcast One segment Transmitter

handy terminal digital broadcast Receivers

Features

- Solution of information service for areas without electricity power
- Japanese digital broadcasting features of low power consumption that enable us to watch TV on our mobile devices

System Total Power Consumption (W)	Expected coverage area (radius km) One Segment
300	3
350	5.8
400	10
450	18

Number of requested broadcast channels	Frequency spectrum (image)	Required transmitter power ratio (note)
13		1
8		8/13
3		3/13
1		1/13

4-3. One-segment test in a rural area

Area check

Lecture

Expectation is very high

It works, we can watch TV

4-4. One-Segment and Emergency Information system idea for rural areas

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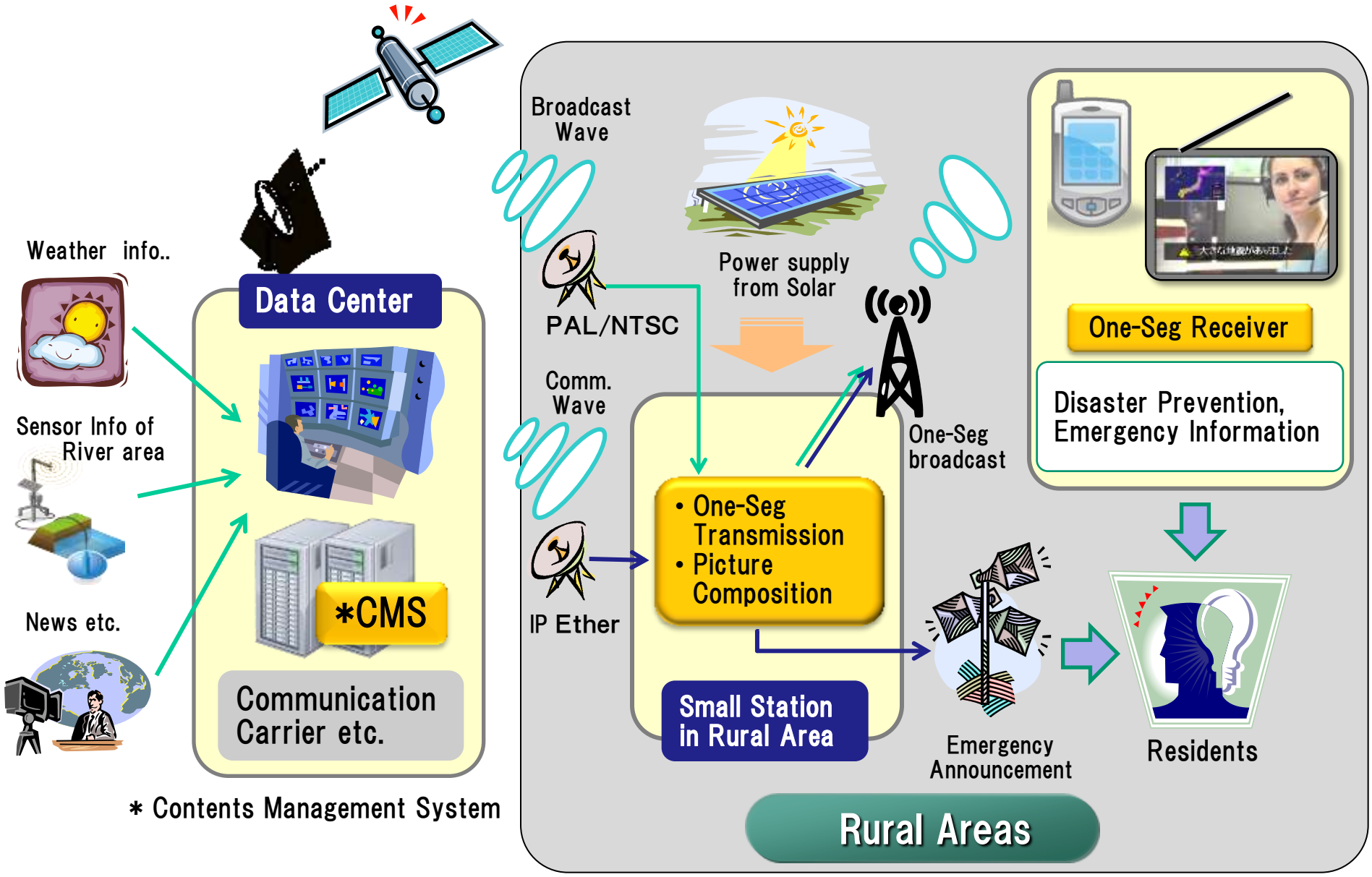

* Contents Management System

END

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(Appendix)
Other examples: Video Conference System

Appendix1-1. Video Conference System

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New Solutions

MCU Simple Operating System

Video Conference terminal
for HD support

H.323

IP

Multipoint connection unit
for HD support

H.323

Bundle
PC Conf. Software

Smart Phone Solution

Recording & Streaming Server

Android
Smart Phone

Original
Protocol

3G/WiFi

iPhone,
iPad

Smart Phone Gateway
‘ClearSea”

IP

PC
(HD)

Appendix 1-2.
Example at Local Fire Department in Japan

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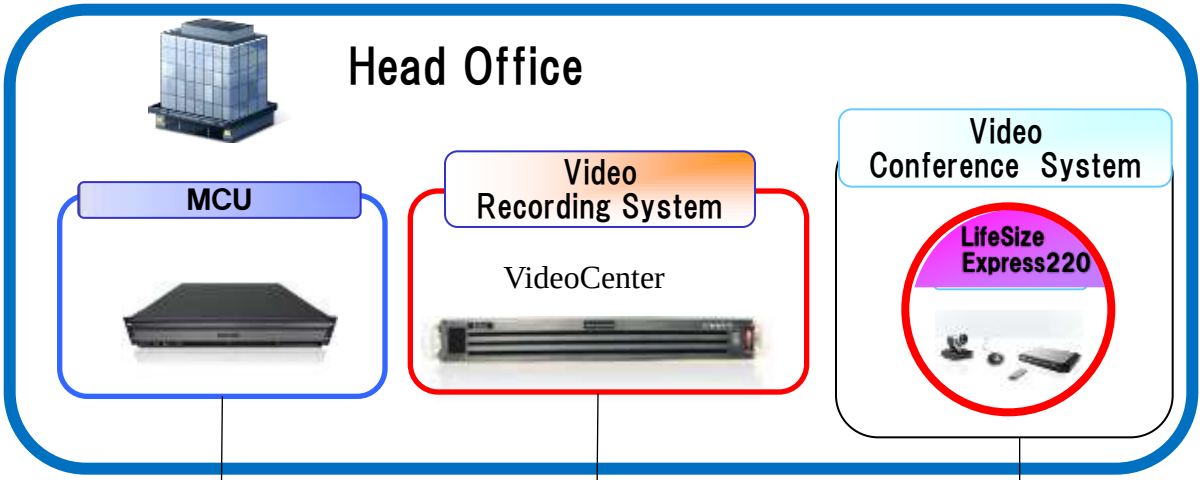
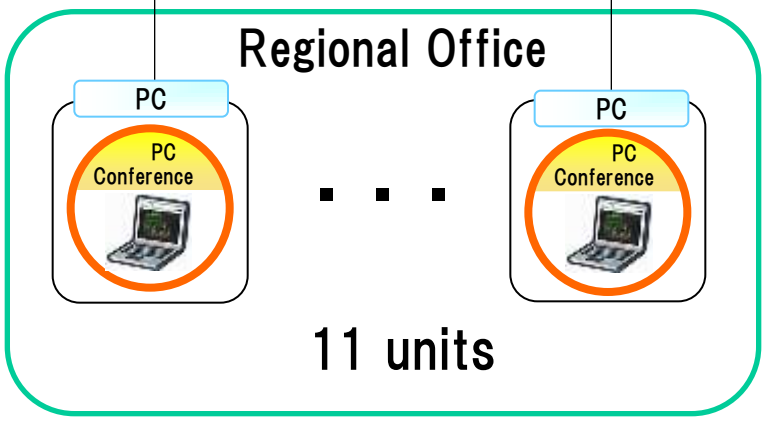
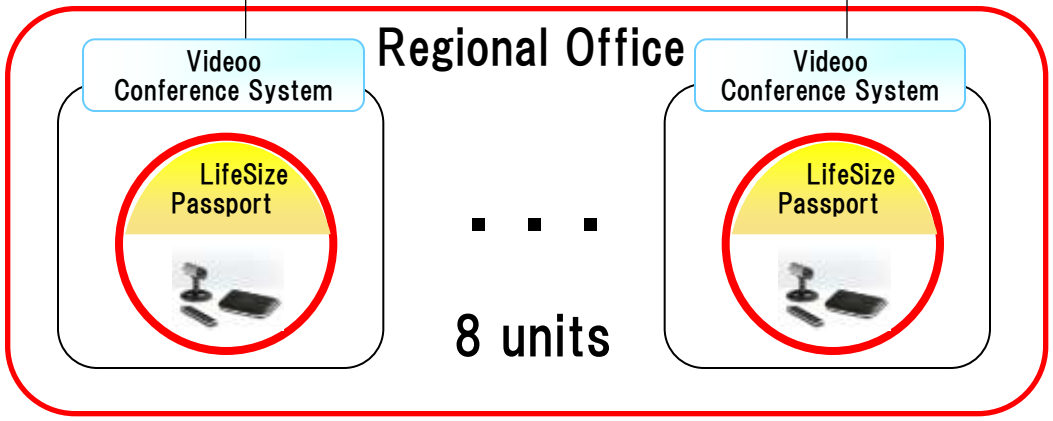
- All participants can attend the conference.
- Education /Training at anytime, anywhere and anybody.







Appendix 1-3.
Example at Odakyu Electric Railway

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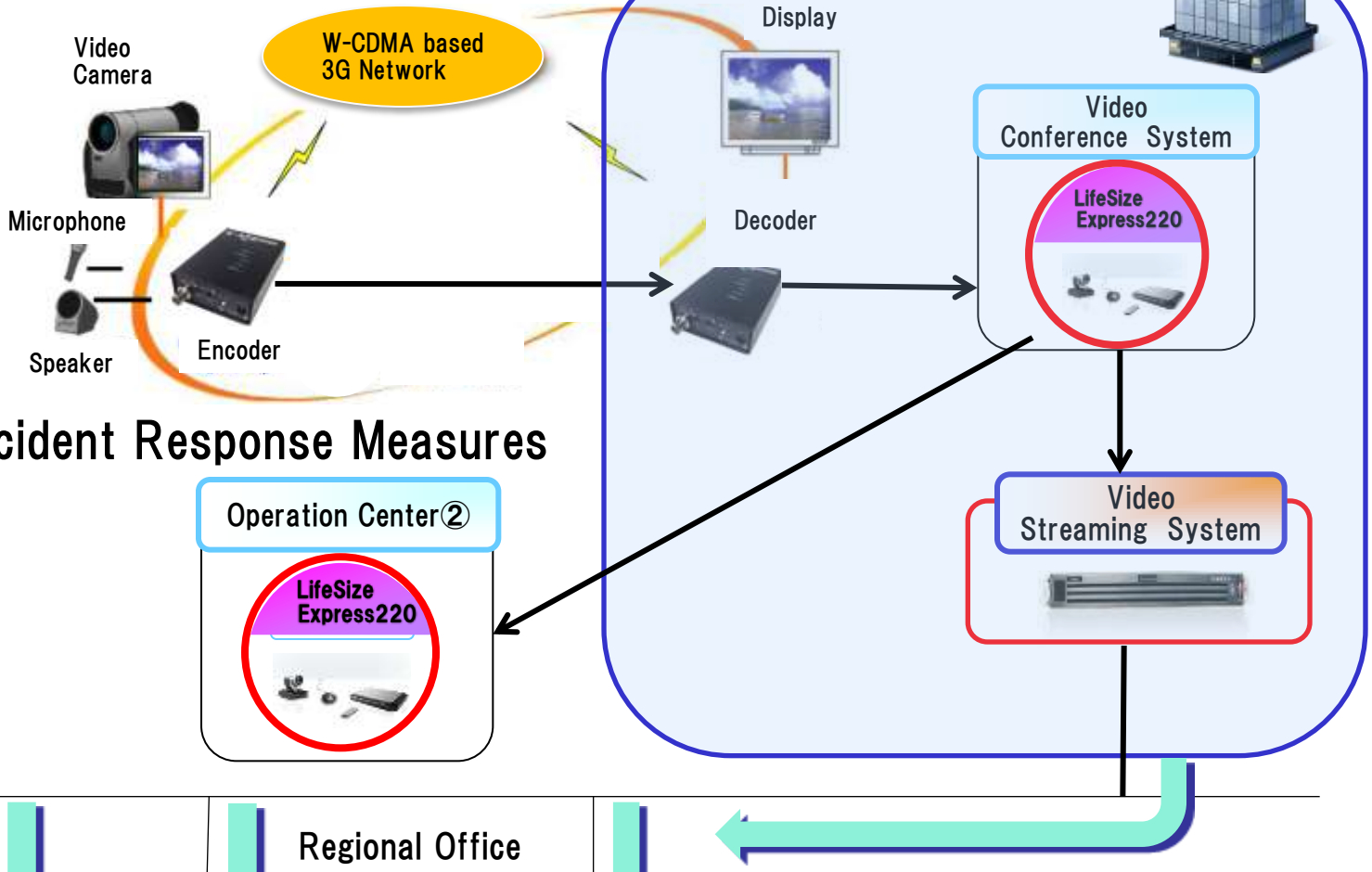
Accident Response Measures meeting



- Real-time Accident Response Measures