Deployment Status of the New Disaster Preparedness Measures
The Great East Japan Earthquake on March 11, 2011 caused extensive damage to DOCOMO’s mobile network, with communication equipment being either destroyed or disrupted due to the earthquake and subsequent tsunami, optical fibers and other transmission lines being disconnected, and emergency battery power being depleted due to long blackouts.

As a result of this experience and the lessons learned, DOCOMO devised numerous new disaster preparedness measures in April 2011, all of which have been fully or almost fully implemented.

The three key points of the measures are:
- Securing communication for key areas and facilities
- Swift response to disaster-stricken areas
- Further improvement of customer convenience during disasters
New Disaster Preparedness Measures

1. Install large-zone base stations throughout the nation in a total of 104 locations, covering 35% of the national population.

2. Provide base stations with uninterruptible power supply (UPS) or 24 hours of battery power, covering 65% of the national population and 50% of the hospitals in a given area (about total 1,900 stations).

3. Immediate distribution of satellite mobile phones (3,000 units).

4. Quickly restore mobile phone service using satellite systems. Increase no. of satellite entrance base stations. (car-mounted type: 19 units and portable type: 24 units).

5. Broaden service recovery using microwave entrance systems (100 areas).

6. Provide Disaster Voice Messaging services.

7. Upgrade “Restoration Area Map” web page.

8. Voice interface for “Disaster Message Board.”

9. Expand Early Warning “Area Mail” service features.

10. Increased use of ICT (SNS, etc.) for emergency communication.

---

Securing communication for key areas and facilities

e.g., administrative centers and densely populated areas

Swift response to disaster-stricken areas

Further improvement of customer convenience during disasters
## New Disaster Preparedness Measures: Breakdown

<table>
<thead>
<tr>
<th>Overview</th>
<th>Estimated impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Securing communication for key areas/facilities</strong></td>
<td></td>
</tr>
<tr>
<td>(1) Construction of base stations using large-zone scheme</td>
<td>¥5.0 billion</td>
</tr>
<tr>
<td>(2) Uninterruptible power supply / 24-hour battery power</td>
<td>¥13.0 billion</td>
</tr>
<tr>
<td><strong>Swift response to disaster-stricken areas</strong></td>
<td></td>
</tr>
<tr>
<td>(3) Rapid provision of satellite mobile phones</td>
<td>¥0.1 billion</td>
</tr>
<tr>
<td>(4) More satellite entrance circuit systems</td>
<td>¥0.6 billion</td>
</tr>
<tr>
<td>(5) Deployment of emergency microwave entrance facilities</td>
<td>¥0.3 billion</td>
</tr>
<tr>
<td><strong>Further improvement of customer convenience during disasters</strong></td>
<td></td>
</tr>
<tr>
<td>(6) Deploy Disaster Voice Messaging services</td>
<td></td>
</tr>
<tr>
<td>(7) Upgraded “Restoration Area Map” web page</td>
<td>¥1.0 billion</td>
</tr>
<tr>
<td>(8) Voice guidance for Disaster Message Board service</td>
<td></td>
</tr>
<tr>
<td>(9) Expanded features for Early Warning “Area Mail” service</td>
<td></td>
</tr>
<tr>
<td>(10) Increased use of ICT(SNS, etc.) for emergency communication</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>¥20.0 billion</td>
</tr>
</tbody>
</table>
# New Disaster Preparedness Measures: Progress

Most measures to be implemented by end February 2012

<table>
<thead>
<tr>
<th>Measures</th>
<th>April</th>
<th>Jun 30</th>
<th>Progress Sep. 30</th>
<th>Dec. 31</th>
<th>Mar. 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Large-zone base station roll-out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All 104 stations installed by end of Feb. 2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>complete</td>
</tr>
<tr>
<td>2-1. Uninterruptible power supply systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. 700 stations installed by end of June 2011</td>
<td></td>
<td></td>
<td></td>
<td>720 stations installed by end of Feb. 2012</td>
<td>complete</td>
</tr>
<tr>
<td>2-2. 24-hour battery supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. 1,000 stations installed by end of Feb. 2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>complete</td>
</tr>
<tr>
<td>3. Rapid provision of satellite mobile phones</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. 1,000 phones deployed by end of Feb. 2012 (plan to deploy 3,000 phones in total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. More satellite entrance circuit systems</td>
<td></td>
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<tr>
<td>24 portable units by end of Sep. 2011 and 9 car-mounted units by Jan. 2012</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. Deployment of emergency microwave entrance facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Complete deployment in 100 areas by end of Sep. 2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>complete</td>
</tr>
<tr>
<td>6. Deployment of Disaster Voice Messaging service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Launch on March 1, 2012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>complete</td>
</tr>
<tr>
<td>7. Upgraded “Restoration Area Map” web page</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed up launch of Web page</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>complete</td>
</tr>
<tr>
<td>8. Voice guidance for “Disaster Message Board” service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Launch for certain new models in summer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>complete</td>
</tr>
<tr>
<td>9. Expanded features for Early Warning “Area Mail” service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free forwarding of messages from national &amp; other governmental institutions (from July 1)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. New ICT (SNS, etc.) for emergency communication</td>
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</tbody>
</table>
By the end of February 2012, DOCOMO will have installed 104 base stations with a large-zone service capability, separately from ordinary base stations, to secure communications over densely populated areas in the event of a wide-area disaster or power outage.

Two base stations for each prefecture, except six for Tokyo and four for Osaka.

7-km radius covered with 360-degree antenna directivity
(radius of ordinary base stations: few hundred meters to several kilometers)
Completion in Hokkaido: Dec. 2011,

Hokkaido district: 3 base stations
- Sapporo
- Asahikawa
- Kushiro

Tohoku district: 12 stations
- Aomori
- Hachinohe
- Morioka
- Oshu

Hokuriku district: 6 base stations
- Kanazawa
- Toyama
- Fukui
- Yamagata
- Tsuruoka
- Akita
- Yokote

- Hakusan
- Takaoka
- Echizen
- Sendai
- Ishinomaki
- Fukushima
- Iwaki

Kanto-Koshinetsu district: 25 base stations


Kanto-Koshinetsu district: 25 base stations
- Nagano
- Matsumoto
- Niigata
- Nagaoka
- Kakegawa

Tokai district: 10 base stations
- Nagoya
- Toyohashi
- Shizuoka
- Numazu
- Hamamatsu
- Gifu
- Ogaki
- Tsu
- Yokkaichi

Kansai district: 14 base stations
- Osaka
- Osaka
- Osaka
- Sakai
- Kyoto
- Fukuchiyama
- Nara

<table>
<thead>
<tr>
<th>Kansai district: 14 base stations</th>
<th>Chugoku district: 10 base stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yamatotakada</td>
<td>Hiroshima</td>
</tr>
<tr>
<td>Kobe</td>
<td>Fukuyama</td>
</tr>
<tr>
<td>Himeji</td>
<td>Okayama</td>
</tr>
<tr>
<td>Otsu</td>
<td>Kurashiki</td>
</tr>
<tr>
<td>Yonago</td>
<td>Tottori</td>
</tr>
<tr>
<td>Shikoku district: 8 base stations</td>
<td></td>
</tr>
<tr>
<td>Nagahama</td>
<td>Takamatsu</td>
</tr>
<tr>
<td>Wakayama</td>
<td>Niihama</td>
</tr>
<tr>
<td>Tanabe</td>
<td>Matsuyama</td>
</tr>
<tr>
<td></td>
<td>Zentsuji</td>
</tr>
</tbody>
</table>
Completion in Kyushu: Jan. 2012

Shikoku district: 8 base stations
- Kochi
- Kami
- Tokushima
- Naruto

Kyushu district: 16 base stations
- Fukuoka
- Kurume
- Kitakyushu
- Saga
- Nagasaki
- Sasebo
- Kumamoto
- Yashiro
- Oita
- Beppu
- Miyazaki
- Miyakonojo
- Kagoshima
- Kirishima
- Naha
- Okinawa
Securing mobile communication capability for prefectural and municipal government offices and other important facilities: almost completed by end of Feb. 2012

**Uninterruptible power supply via engine**

- Nearly finished by end of June 2011
- (Feb. 2012: approx. 720 stations, approx. 99%)

**24-hour power supply**

- Almost completed by end of Feb. 2012
- (Feb. 2012: approx. 1,000 stations, approx. 87%)
24 Hours of Battery Power Supply (1)

Overview of installation process (4 to 6 months)

Planning/Consultation 3-5 months
- Confirm required battery capacity (select equipment, design structure and layout, etc.)

Basic construction 2 weeks (preparing site, base construction, etc.)

Battery delivery 1 week (setup, etc.)

Battery Installation 1 week (installation, connection, testing, etc.)

Completion
- (after inspecting for fire code compliance)

Before base construction
- Bringing in battery
- After battery installation
<table>
<thead>
<tr>
<th>Pattern 1</th>
<th>Pattern 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(locate in existing space)</td>
<td>(locate in new battery box)</td>
</tr>
</tbody>
</table>

**Before**

- Added batteries

**After**

- Battery box

---

*24 Hours of Battery Power Supply (2)*
Battery configuration depends on base station and available space.
Prompt Supply of Satellite Mobile Phones

• Provide mobile communication immediately after disaster by providing satellite mobile phones to evacuation centers, etc.

• Deploy 3,000 phones during major disasters (1,000 now ready to deploy)
Increased Deployment of Satellite and Microwave Entrance Systems (1)

- Effectively utilize rapidly deployable, highly mobile satellite and microwave systems to ensure early restoration of communication in affected areas
- Increase the number of satellite-entrance mobile base stations (19 car-mount units and 24 portable units)
- Deploy emergency microwave entrance systems (100 areas)
Increased Deployment of Satellite and Microwave Entrance Systems (2)

- Increase no. of car-mounted satellite entrance base stations
- 9 new mobile base stations (brings existing total to 19)
• Deployment of portable-type satellite entrance base stations
• Self-Defense Forces training exercise for delivery of portable base stations from DOCOMO’s Hokkaido office by helicopter on Nov. 21, 2011
Deployment of Disaster Voice Messaging Service

- Disaster Voice Messaging service (starting March 1, 2012) enables people to send messages as data files when voice calls become restricted due to a disaster.
- Trial usage of the service will be possible until March 31, 2012.

Key Features of Service
- Free of charge
- Activated in tandem with Disaster Message Board
- Available nationwide

Calling restrictions due to network congestion

(1) Attempted voice call convergence

(2) Select voice message service and record message

(3) Send message as data file

(4) Notification, after message is played

I'm safe, taking shelter at an elementary school nearby.

Packet communication network

Voice communication network

I'm safe, taking shelter at an elementary school nearby.

Play back caller’s voice message
Upgraded “Restoration Area Map” Web Page

- Improvements including faster launch of service and enhanced legibility (from December 23, 2011).

Map shows progress of mobile service restoration by area.
Voice Guidance for Disaster Message Board service

- Disaster message board app can be activated by voice (Japanese only), as well as touchscreen operation
- Easy to register/confirm messages by voice, or by touch

Compatible models
- Select handsets in the 2011 Summer lineup
- All smartphones in the 2012 Winter/Spring lineup

1. Activate app

Select “Disaster Message Board (simplified version)”

2. Follow voice guidance for easy operation

Select App

Please touch ‘message registration’ or ‘message confirmation’ icon.

Please register your status information. Touch the icon that describes your status.

“Select person whose status you wish to check.”

Registration of user status

Disaster Message Board (server)

Register status

Confirm status

Check status of family/relatives

- Activating the app by voice requires use of smartphone’s voice-input function.
- Previous app, Disaster Message Board, must be updated to use this new service.
Expansion of Early Warning “Area Mail” Service (1)

- Provides early warnings of strong earthquakes from Japan Meteorological Agency and disaster/evacuation information from national and regional public institutions.
- On July 1, 2011, Area Mail became a completely free service for national and other government institutions.

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>700</td>
<td>800</td>
</tr>
</tbody>
</table>

- 878 municipalities had introduced the service as of February 17, 2012
- Warnings received in given area
- At home
- During commute
- Government institutions
- Disaster & evacuation info
- Free of charge from Jul. 1
Tsunami warnings issued by the Japan Meteorological Agency for 66 coastline areas will be transmitted to mobile devices via DOCOMO’s Early Warning “Area Mail” disaster information service beginning February 24.

<table>
<thead>
<tr>
<th>When</th>
<th>Immediately after a potentially hazardous tsunami is forecast. Includes “major tsunami” expected to reach or exceed three meters and “tsunami” expected to reach up to two meters. Tsunami advisories are not covered.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas</td>
<td>66 coastline areas</td>
</tr>
<tr>
<td>What</td>
<td>Tsunami warnings (“tsunami” and “major tsunami”)</td>
</tr>
<tr>
<td>Compatible models</td>
<td>Early Warning “Area Mail” service compatible models launched from/after November 2007</td>
</tr>
</tbody>
</table>
• View Google Person Finder registry/messages on Disaster Message Board screen of mobile devices
• DOCOMO’s dmenu (smartphones) and i-menu (other phones) portals display disaster-related tweets from national/local governments and mass media, etc. for easy collection of disaster related information.

Integration with Google Person Finder
(From the end of March 2012)

Integration with Twitter
(From Feb. 2012)

Disaster related Twitter accounts
• Government
• Infrastructure
• Newsmedia
Future initiatives for increased network safety and reliability

Dispersal of critical facilities (concept)

As a precaution for the possibility of a major earthquake centered on Tokyo, DOCOMO plans to decentralize critical facilities now concentrated in the capital region, relocating some of them to Kansai and Kyushu areas within fiscal year 2012.

Green base stations

Eco-friendly power control technology

- Secure electric power supply
  - Introduce solar panels and lithium-ion batteries
  - Control with high-efficiency DC conversion
  - Use base station battery data for operation

- Electric power savings
  - Reduce commercial batteries by using solar panels
  - Leverage peak shifts by using nighttime electricity

- Visualization
  - Determine real-time power needs of base stations
  - Install equipment for collecting battery data

Other related initiatives

- Established office to coordinate reconstruction assistance in Tohoku area (December 1, 2011)
- Revised manual for disaster procedures, including business continuity plan (BCP)
- Implemented emergency drills and training in how to communicate in disasters
- Tightened partnerships with various institutions, including Self Defense Force