Recovering from the Great East Japan Earthquake: NTT East’s Endeavors
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Restoration and reconstruction timeline

Cover photo: Sankei Shimbun

Ishinomaki City, Miyagi Prefecture
First of all, I would like to extend my greatest sympathies to all the victims of the Great East Japan Earthquake. We hope and pray for the earliest possible recovery from the disaster.

The disaster also inflicted unprecedented damage on the NTT East Group’s communications equipment. In addition to the damage caused by the tsunami to exchange buildings, telephone poles and transmission lines, large-scale power outages resulted in unavoidable service interruptions. Please accept our apologies for any inconvenience caused.

The disaster served as a cruel reminder of the importance of our mission to provide services that keep people connected at all times in any circumstances. Telecommunications networks are vital lifelines, and we have devoted all of our resources to the early restoration of our communications equipment so as to enable as many people as possible to connect and remain connected to each other as soon as possible.

With the help of employees from other NTT Group companies and telecommunications construction companies, as many as 6,500 personnel were involved in restoration at its peak, and as a result of their efforts, almost all of the exchange buildings in affected areas had been restored by the end of April 2011, just over six weeks after the disaster struck.

We also provided victims with communications from immediately after the disaster struck by equipping evacuation centers with emergency use public phones, Internet connections, and Wi-Fi services, as well as other assistance including making company housing available to local authorities and offering remote health consultations via videophones.

Currently, the Tohoku Future Network Design and Reconstruction Office that we established in May is supervising full restoration operations aimed at improving the reliability of our networks by relocating damaged buildings to higher ground and securing inland transmission routes. Moving forward, we will further rebuild our communications infrastructure in line with central and local government reconstruction plans, and use the lessons learned from this disaster to further improve the reliability of our communications networks nationwide.

Tsutomu Ebe
President
NIPPON TELEGRAPH AND TELEPHONE EAST CORPORATION

November, 2011
The Great East Japan Earthquake struck at 2:46 p.m. on March 11, 2011, causing damage on an unprecedented scale mainly along Tohoku’s Pacific coastline. The massive M9 earthquake shook the Tohoku and Kanto regions, followed by a huge tsunami of up to about 40 m that inundated the Pacific coastline of both regions.

<table>
<thead>
<tr>
<th>Item</th>
<th>Great East Japan Earthquake</th>
<th>Great Hanshin-Awaji (Kobe) Earthquake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date and time</td>
<td>2:46 p.m., March 11, 2011</td>
<td>5:46 a.m., January 17, 1995</td>
</tr>
<tr>
<td>Epicenter</td>
<td>Pacific Ocean, near to Tohoku’s Sanriku coast</td>
<td>In the Akashi Channel north of Awaji Island</td>
</tr>
<tr>
<td>Magnitude</td>
<td>9.0</td>
<td>7.3</td>
</tr>
<tr>
<td>Death toll</td>
<td>15,835&lt;sup&gt;1&lt;/sup&gt;</td>
<td>6,434</td>
</tr>
<tr>
<td>Missing persons</td>
<td>3,664&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3</td>
</tr>
<tr>
<td>Evacuees</td>
<td>approx. 470,000 max.&lt;sup&gt;3&lt;/sup&gt;</td>
<td>approx. 120,000 max.</td>
</tr>
<tr>
<td>Households affected by power outages (excluding planned outages)</td>
<td>approx. 8,400,000 max.&lt;sup&gt;3&lt;/sup&gt;</td>
<td>approx. 2,600,000 max.</td>
</tr>
</tbody>
</table>

1. National Police Agency (as of November 9, 2011)  
2. Cabinet Office White Paper on Disaster Management 2011  
3. Calculated from Ministry of Economy, Trade and Industry published data
NTT East provides network infrastructure not only for fixed-line telephones, but also for public and private sector data communications, traffic between mobile phone base stations and various other data transmission. This infrastructure suffered unprecedented damage as a result of the Great East Japan Earthquake. The tsunami in particular caused enormous damage that far surpassed the impacts of the Great Hanshin-Awaji (Kobe) Earthquake of 1995.

The widespread and prolonged power outages prompted by the earthquake also affected 990 exchange buildings at the peak of the crisis, incapacitating many of them. As a result, approximately 1.5 million lines in the Tohoku region and adjacent areas were affected.

1. Exchange buildings are buildings that house the communications equipment required to provide phone and Internet services to customers.

<table>
<thead>
<tr>
<th>Item</th>
<th>Great East Japan Earthquake</th>
<th>Great Hanshin-Awaji (Kobe) Earthquake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic at peak</td>
<td>approx. 9-fold</td>
<td>approx. 50-fold</td>
</tr>
<tr>
<td>Incapacitated buildings</td>
<td>380</td>
<td></td>
</tr>
<tr>
<td>Damaged lines</td>
<td>approx. 1.5 million</td>
<td>approx. 285,000</td>
</tr>
<tr>
<td>Time required to restore services</td>
<td>approx. 50 days (including nuclear power plant area and evacuated areas)</td>
<td>approx. 2 weeks (excluding totally destroyed buildings or houses)</td>
</tr>
<tr>
<td>Trunk lines</td>
<td>approx. 90 routes (excluding nuclear power plant area)</td>
<td></td>
</tr>
<tr>
<td>Exchange buildings</td>
<td>16 completely destroyed, 12 flooded¹</td>
<td></td>
</tr>
<tr>
<td>Telephone poles</td>
<td>approx. 28,000 (total area)</td>
<td>approx. 3,600</td>
</tr>
<tr>
<td>Aerial cables</td>
<td>approx. 3,200 km (epicentral area)</td>
<td>approx. 330 km</td>
</tr>
</tbody>
</table>

¹. Changed from figures announced on March 30, 2011 as a result of field surveys

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**Restoration of functionality to exchange buildings in the three Tohoku prefectures of Iwate, Miyagi, and Fukushima**

(based on available data as of March 22, 2011)

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**Diagram notes:**

- Buildings (service area) restored from March 22 to the end of March (42 buildings)
- Buildings (service area) restored in early April (21 buildings)
- Buildings (service area) restored in mid-April (17 buildings)
- Buildings (service area) restored in late April (17 buildings)
- Buildings (service area) restored from early May (5 buildings)

*Information is from March 22, 2011 onwards.

- Divided according to the periods when exchange buildings associated with subscriber lines were restored.

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**Additional notes:**

1. Exchange buildings are buildings that house the communications equipment required to provide phone and Internet services to customers.

2. Changed from figures announced on March 30, 2011 as a result of field surveys.
Widespread damage to access lines

The access lines that connect the customer premises to NTT East exchange buildings suffered widespread damage. A great many telephone poles were swept away by the tsunami, while liquefaction and land subsidence caused others to lean or topple over. Underground ducts also suffered damage from submergence and mudslides caused by the tsunami. Many access lines were severed or impaired as a consequence of such damage.

Sturdy exchange buildings destroyed in an instance by the tsunami

Exchange buildings that constitute the cornerstone of NTT East’s communications networks are built to withstand earthquakes of the strongest seismic intensity, but the communications and power supply equipment of many buildings was inundated by the tsunami, and some buildings were completely swept away or destroyed.
It was almost impossible to get an accurate picture of what had happened on the ground immediately after the earthquake, but we could tell by the number of alarms indicating malfunctions that our equipment had suffered large-scale damage.

Within two or three days, we had a much clearer picture of the damage, and realized it was far more serious than just the kind of severed cables that we had experienced with previous earthquakes, involving as it did the incapacitation of whole exchange buildings.

It was plain to see that we would get nowhere with the kind of standard repair procedures and organization that we had used up to then. We knew that we were going to be in for a long haul, and needed to mobilize a great many people and resources and put together a new unit for building equipment from scratch.

Also, the quake caused widespread power outages in the Tohoku and Kanto regions on a scale that we had never before encountered, and so we needed to check battery capacity and performance of on-premise generators and at the same time dispatch power supply vehicles in order of priority.

Grasping with the awesome consequences of the earthquake

Masayuki Kato
Sub Leader, Information Control Group, Headquarters Disaster Countermeasures Office

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Employee positions are as they were when the earthquake struck.
Responding to the greatest natural disaster that Japan has ever suffered

Early response: Efforts to identify extent of damage and secure communications

Immediately after the Great East Japan Earthquake struck, NTT East established a Disaster Countermeasures Office and launched disaster response measures. We marshaled all of our Group’s resources to identify the precise extent of damage and start recovery efforts while at the same time doing our utmost to provide means of communication to people eager to check on the well-being of evacuation center occupants and other family and friends cut off from the outside world in the disaster area. We also endeavored to keep communications equipment going in the face of large-scale power outages, while also implementing stopgap measures to restore connections in our communications networks.

Disaster countermeasures offices were established in NTT East’s head office and branch offices in Iwate, Miyagi, Fukushima, and other parts of East Japan to implement emergency response measures.

Support vehicles from West Japan about to be transported to the Tohoku region by ferry from the port of Tsuruga in Fukui Prefecture

Support vehicles from the Kansai region

NTT personnel checking on damage used motorcycles for their ability to navigate through rubble.

NTT East supplied a total of 138.3 tons of food, beverages, blankets, and other necessities from Tokyo and other regions.

Whiteboard used to record the ever-changing status of recovery efforts

Sleeping space for personnel who had gone to Miyagi to support recovery efforts

Helicopter used to survey disaster damage

Aerial photographs of the cities of Rikuzentakata (left) and Kesennuma (top right), and Kesennuma’s city center (bottom right)
Securing communications for checking safety status

Disaster Emergency Message Dial (171) and Disaster Emergency Broadband Message Board (Web 171) service operation

Because its networks were inundated by nine times as many phone calls as normal in the Tohoku and Kanto regions immediately after the earthquake, NTT East restricted network traffic by up to 90% at the peak to secure capacity for emergency calls and other critical communications.

To provide means for checking on the safety of people affected by the disaster under these circumstances, NTT East launched its Disaster Emergency Message Dial (171) and Disaster Emergency Broadband Message Board (Web 171) services.

Until they were terminated on August 29, 2011, Disaster Emergency Message Dial (171) was used approximately 3.48 million times, and Disaster Emergency Broadband Message Board (Web 171) 330,000 times — about ten times the previous maximum usage, which was for the Niigata Chuetsu Earthquake.

Message handling

Certain measures launched by employees on their own initiative in disaster area locations were taken up in other locations too.

Message handling started when NTT Group construction employees engaged in restoring communications equipment and installing emergency use public phones were asked by people in the disaster area who had no phone connections to provide some means of informing other family members that they were alive and well. The employees offered to pass messages on as soon as they got back to their companies.

First ever free provision of public phone calls

In Tokyo and its surroundings, all public transportation stopped on the day of the earthquake, and over 5 million people* were left stranded in the city, unable to get home. With mobile phone networks suffering congestion, means of communication were limited, and so in addition to its efforts to secure communications in the disaster area, the NTT Group provided free calls at approximately 122,000 public phones for the first time in its history.

*Source: Cabinet Office (announced on November 22, 2011)
Installing emergency use public phones

We installed emergency use public phones in evacuation centers to provide occupants with a means of communication. As of November 9, 2011, we had installed 3,930 emergency use public phones in 1,202 locations. We also installed Internet access points with the cooperation of other companies*.

<table>
<thead>
<tr>
<th></th>
<th>Emergency use public phones</th>
<th>Internet access points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of phones</td>
<td>Number of access points</td>
</tr>
<tr>
<td>Total aggregate</td>
<td>1,202</td>
<td>3,930</td>
</tr>
<tr>
<td>Tokyo (other than Kanto)</td>
<td>744</td>
<td>2,817</td>
</tr>
<tr>
<td>Other prefectures</td>
<td>458</td>
<td>1,113</td>
</tr>
<tr>
<td>Number at peak time</td>
<td>April 5, 1,000</td>
<td>March 10, 203</td>
</tr>
</tbody>
</table>

* Toshiba Corporation, NEC Corporation, Fujitsu Limited, BUFFALO INC., NTT Communications Corporation, and NTT Plala Inc.

Checking on the safety of family members was uppermost in people’s minds. (Otsuchi Town, Iwate Prefecture)

Satellite mobile phones were distributed to the evacuation centers by helicopter with the help of the Japan Self-Defense Forces.

CARRYING SATTELITE MOBILE PHONES TO ISOLATED EVACUATION CENTERS BY HELICOPTER WITH THE HELP OF THE JAPAN SELF-DEFENSE FORCES

Portable satellite device connecting emergency use public phones at an evacuation center during a snowstorm (Kamitaki Town, Iwate Prefecture)

Employee positions are as they were when the earthquake struck.

Photo: Kyodo News

I felt really proud of my job when I saw people checking on the safety of their relatives.

Yasushi Matsukawa
Branch chief, Ishinomaki Sales Branch, NTT East-Miyagi Corporation

Our Ishinomaki Sales Branch handles the third largest area in Miyagi Prefecture, with about 90,000 lines. The branch building is about 2 km upstream from the mouth of the Kiyu-Kitakami River, and its first floor was swamped by the tsunami that rode up the river. At the time there were over 30 people — both employees and people from nearby who had taken shelter there — in the building, but luckily everyone was on the second floor and survived the ordeal. It took ages for the water to recede from the city, and so we were all stuck in the building for two whole days.

The disaster brought home to me the importance of our mission to connect people.

Noriyuki Furusato
Deputy manager, Kamishi Service Center, NTT East-Iwate Corporation

Because NTT East’s Iwate Kamaishi Service Center is located inland, we were lucky enough to escape any direct damage from the tsunami, but two of our major exchange buildings in the Kamaishi area — our Omachi Building and Unosumai Building — were hit by the tsunami, knocking out the region’s communications networks.

As a result, the city of Kamaishi and its surroundings became totally cut off from the world, with no electricity, and both fixed- and mobile phones rendered useless. Using satellite mobile phones, we immediately set up emergency use public phones at the service center to enable people to check on the safety of relatives and friends. The following morning, we deployed a small parabola antenna with four phones, and as word spread, more and more people wanting to make calls turned up at the center, and long queues soon formed. At the peak, over 1,000 people were queuing, and there were still queues past midnight, with some people waiting up to five hours for their turn.

By late afternoon on the second day, we were beginning to run out of fuel for our emergency on-premise generator, and it was touch and go whether we would make it to the morning. We employees decided to keep communications going around the clock as long as the fuel held out, and we stayed up all night helping people to make contact with family and friends. Luckily, some group company employees had managed to get their hands on some fuel for us, enabling us to keep the public phones running for people desperate to make contact with loved ones.

I’ll never forget the smiles on the faces of customers who had waited so long, and had finally got through after calling again and again, and the way elderly people thanked us when we redialed for them. I was also struck by the way disaster victims asked us to move women with small children to the front of the queue. Phones are designed to connect you to others, and you take them for granted in normal times, but the disaster brought home to me the importance of our mission to connect people.

The disaster brought home to me the importance of our mission to connect people.

Responding to the greatest natural disaster that Japan has ever suffered

Early response

Efforts to identify extent of damage and secure communications

3.

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Recovering from the Great East Japan Earthquake: NTT East’s Endeavors

18
3 Protecting communications against large-scale power outages

Fuel supply hindered by fuel shortages and damaged roads

By causing oil storage depots in Miyagi, Chiba, and elsewhere to go up in flames and rendering the Tohoku Expressway and other transportation arteries impassable, the earthquake triggered serious fuel shortages from very soon after it struck. NTT East accordingly found it very difficult in the first few days after the quake to secure the fuel it needed to operate power supply vehicles and on-premise generators. (Later resolved by procuring fuel on the market and with the cooperation of central and local governments)

Over 100 power supply vehicles mobilized

As soon as the massive earthquake struck, power supply vehicles stationed in various locations around the country, including NTT West Group vehicles, headed to the disaster area to supply electricity to the most important exchange buildings.

Restoring grid power supply in the area covered by Tohoku Electric Power took a particularly long time, and 18 exchange buildings were still dependent on on-premise generators on May 13, 2011, over two months after the earthquake.

Juggling scarce resources to restore connections

On the day of the earthquake, NTT East’s Miyagi Branch Disaster Countermeasures Office had its hands full coping with power outages that affected the whole prefecture. Although it was still impossible to identify the extent of overall damage with communications down, we received a constant stream of news of power outages. We had issued instructions to secure power for exchange buildings knocked out by power shortages.

We faced some tough decisions. Our fuel stocks in Miyagi Prefecture were limited, and if we used them all up, we would be unable to keep emergency generators, on-premise generators, and power supply vehicles, but we were unable to cope with the sheer quantity of stoppages.

We were able to keep our systems going.

Employee positions are as they were when the earthquake struck.
Responding to the greatest natural disaster that Japan has ever suffered

Stopgap measures: Efforts for the early restoration of communications

The Great East Japan Earthquake inflicted unprecedented damage on NTT East’s communications networks, and it was up to its equipment-related employees and those of affiliated companies who gathered from throughout the country to put it to rights. Everyone worked furiously to restore equipment as quickly as possible, and as a result of implementing various stopgap measures, exchange buildings in almost every location were once again in operation by the end of April.

NTT East also fulfilled its role as a designated public institution under the Basic Act on Disaster Control Measures* by prioritizing restoration of the lines of local authorities, hospitals, and other critical institutions upon which the lives and safety of the public depend.

*Six telecommunications companies — five NTT Group companies (holding company NTT Corporation, NTT East, NTT West, NTT Communications, and NTT DOCOMO) and KOEI — are designated public institutions.

<table>
<thead>
<tr>
<th>Restoration initiatives</th>
<th>Restoration method</th>
<th>Restoration details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securing transmission trunk lines</td>
<td></td>
<td>■ Reconnected damaged cables and implemented stopgap measures such as existing provisional aerial bypass routes</td>
</tr>
<tr>
<td>Repairs to exchange buildings</td>
<td></td>
<td>■ Cleared debris from buildings that could not be reused, then cleaned and provisionally repaired them</td>
</tr>
<tr>
<td>Replacement of electrical equipment</td>
<td></td>
<td>■ Temporarily installed new power equipment (power incoming units, rectifiers, batteries)</td>
</tr>
<tr>
<td>Repairs to communications equipment</td>
<td></td>
<td>■ Used power supply vehicles and emergency generators to provisionally restore power</td>
</tr>
<tr>
<td>Transfer to another exchange building</td>
<td></td>
<td>■ Diverted inventory and parts reserved for planned works to install new communications equipment</td>
</tr>
<tr>
<td>Area-wide restoration of access lines</td>
<td></td>
<td>■ Prioritized restoration of public infrastructure through restoring leased lines, etc. (Japan Self-Defense Forces, airports, subways, etc.)</td>
</tr>
</tbody>
</table>

Exchange building functions almost completely restored by end of April

The whole group worked as one on the restoration effort, and as a result, almost all the functions of exchange buildings in customer residential areas were restored by the end of April.

Marshaling group resources for restoration efforts

Damage was on such a scale that the NTT Group needed to marshal all of its resources to restore communications and provide people with means for checking on the safety of relatives and friends. At the peak of such efforts, 6,500 personnel were engaged in such restoration and assistance activities.
4 Restoring trunk lines

We endeavored to restore damaged trunk lines by reconnecting severed cables, building bypass routes, and switching routes.

Building bypass route by erecting telephone poles along railway

Iwate Prefecture
Connecting the Ofunato Building and Kamaishi Kaminakashima Building (between Sanriku Station and Horei Station)

The Sanriku Railway line took a trunk line with it when it was swept away by the tsunami. We erected 11 telephone poles alongside the railway and strung cables to restore the trunk line.

Rerouting a trunk line upstream to string a cable across a river where it was narrower

Iwate Prefecture
Connecting the Rikuzen-takata Building and Kesennuma Building (Kesen Bridge)

Kesen Bridge was swept away by the tsunami, taking a trunk line with it. We rerouted the line upstream to string a cable across the river where it was narrower.

Step 1
Dragging a rope over the river to pull the suspension wire

Step 2
Stringing the cable

Step 3
Pulling the fiber optic cable with a rope

Step 4
Attaching the fiber optic cable

After restoration

Connecting the cores of bypass cables to existing cables

New telephone poles erected near a railway

Iwate Prefecture Connecting the Ofunato Building and Kamaishi Kaminakashima Building (between Sanriku Station and Horei Station)

11 telephone poles erected near a railway

Connecting the cores of bypass cables to existing cables

The trunk line connecting the Ofunato building and Kamaishi Kaminakashima Building was severed by the tsunami. We erected 11 telephone poles alongside the railway and strung cables to restore the trunk line.

The Sanriku Railway line took a trunk line with it when it was swept away by the tsunami. We erected 11 telephone poles alongside the railway and strung cables to restore the trunk line.
Restoring exchange buildings

We restored tsunami-damaged exchange buildings by various methods according to the extent of damage, including replacement of power incoming units and communications equipment, installation of container-like temporary exchanges, and feeders from other exchange buildings.

Installation of new power incoming unit on third floor

Ishinomaki Kadowaki Building, Miyagi Prefecture

While communications equipment housed in the upper floors escaped inundation, power supply equipment on the ground floor was submerged by the tsunami. We accordingly installed a new power incoming unit on the third floor, and restored communications services by using power supply vehicles until grid power was restored.

Unosumai Building, Iwate Prefecture

The tsunami wreaked havoc on this building, and both power supply and communications equipment was inundated. We re-used the building’s frame and replaced walls with plastic sheets and plywood as stopgap measures, and restored communications services after installing new power supply and communications equipment.

Building repair and communications equipment replacement

We restored tsunami-damaged exchange buildings by various methods according to the extent of damage, including replacement of power incoming units and communications equipment, installation of container-like temporary exchanges, and feeders from other exchange buildings.
Installing container-like temporary exchanges to restore services

Shichigahama Building, Miyagi Prefecture

Since the Shichigahama Building was completely carried away by the tsunami, we restored services by replacing it with container-like temporary exchanges fitted with all necessary equipment and designed for outdoor installation.

![Shichigahama Building, Miyagi Prefecture](image)

The site where the Shichigahama Building used to stand.

[Image 56x438 to 296x616]

The site was leveled, and foundation laid.

[Image 189x118 to 343x165]

Container-like temporary exchanges slated for use elsewhere were requisitioned for installation on the site.

Restoring services by using feeders from other buildings

Shizugawa Building, Miyagi Prefecture

The tsunami caused extensive damage to the Shizugawa Building, and also submerged power supply and communications equipment. We restored services by extending communications equipment from other buildings.

![Step 1](image)

Step 1: We extended communications equipment from our Kesennuma Building to substitute for the damaged Shizugawa Building and restores communications to parts of the town of Minami-sanriku that lay outside the disaster area.

![Step 2 (Copper)](image)

Step 2 (Copper): We suspended plans for new installations or renovations elsewhere, and diverted equipment set aside for those plans to use here.

Step 2 (Fiber optic):

Area-wide restoration of fiber optic services by stringing fiber optic cables from OLT 2, to each area.

Rikuzen-takata Building, Iwate Prefecture

The tsunami inundated the building, submerging both power supply and communications equipment. To restore communications services to key municipal offices as soon as possible, we extended communications equipment from other buildings. We later repaired the building and replaced its communications equipment so as to provide communications to other subscribers too.

![Rikuzen-takata Building, Iwate Prefecture](image)

Since the Shichigahama Building was completely carried away by the tsunami, we restored services by replacing it with container-like temporary exchanges fitted with all necessary equipment and designed for outdoor installation.

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The tsunami caused extensive damage to the Rikuzen-takata Building, Iwate Prefecture, and also submerged power supply and communications equipment. We restored services by extending communications equipment from other buildings.

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Area-wide restoration of fiber optic services by stringing fiber optic cables from OLT 2, to each area.

Rikuzen-takata City Hall (submerged)

Providing communications from a neighboring NTT exchange building by forming fiber optic lines from MT 2303020.
The tsunami inflicted extensive damage on telephone poles, cable ducts and cables. After clearing away debris, we restored communications by erecting telephone poles, stringing cables to customer residential areas, and connecting access lines.

Step 1
Stringing a lead-up cable after clearing away debris and erecting telephone poles.

Step 2
Stringing an aerial cable.

Step 3
Connecting cables in a manhole.

Step 4
Connecting aerial cables.

We erected telephone poles, strung cables, and connected them to new temporary housing to provide residents with communications.
Fulfilling the NTT Group’s mission
Restoring exchange buildings in the Fukushima nuclear power plant area

5

The Fukushima Daiichi nuclear power plant accident forced eight local authorities — Futaba, Namie, Kawauchi, Tomioka, Hirono, Katsurao, Okuma, and Naraha — to move their public offices out of the area.

NTT East helped the municipalities by providing their new temporary public offices with communications.

Servers and other important equipment required by the town of Okuma to maintain public office functions were left behind when the town was evacuated. We put together a team and headed with Okuma municipal employees to the town’s public office within 5 km of the Fukushima Daiichi nuclear power plant, and retrieved about 90 servers, PCs, and other items of equipment that we then transported to the town’s new temporary office.

— Manabu Yoshimoto
Chief officer, Disaster Countermeasures Office, NTT East Fukushima Branch

I had never imagined that a nuclear accident and radiation leaks could occur, and so when I first heard about the accident, the thought crossed my mind that we would have to stop whatever we were doing. I felt strongly that we needed to do something about the situation. I felt ready to quit my job, since they were working flat out, and so when the Iwaki Tomioka Building was rehabilitated and communications restored, and people called to thank us, it was very rewarding.

What with radiation and other problems, the situation is not easy, but even if there are only one or two people involved, we have a duty to connect them.

I think it is also my duty to protect the safety and health of our employees engaged in restoration work out in the field.

This disaster made me newly aware of why we exist and our duty to connect people.

— Manabu Yoshimoto
Chief officer, Disaster Countermeasures Office, NTT East Fukushima Branch

Our employees gathered at J-VILLAGE, the Fukushima Daiichi accident cleanup operation base. The power company handed each of them a dosimeter, and gave them a lecture about radiation.

Our special precautions against radiation included protective suits, gloves, and a double layer of protective foot covers.

Our employees were allowed four hours to complete all necessary work. There were some difficult aspects, but the work went smoothly and we managed to restore functions in the given time.

Employee positions are as they were when the earthquake struck.
We waived basic monthly charges for the approximately 2 million customers who were unable to use their lines because of equipment damage, or who were effectively unable to make calls because they had been forced to evacuate, and other similar reasons.

We also extended payment due dates by up to three months if requested to do so by customers.

In initiatives for temporary housing, etc., we provided free phones to temporary housing occupants. We waivered line relocation charges for people moving temporarily out of the disaster area as a result of the Great East Japan Earthquake. We also provided free phones to occupants of temporary housing, etc., donating 30,000 phones to local authorities.

We also provided communications systems at no charge to the temporary staff rooms of public schools that had been swept away or otherwise severely damaged by the earthquake and tsunami so as to help such schools to resume operations.

Providing communications to local authorities

The public offices of many local authorities were swept away or submerged by the tsunami. Since such local authorities play a central role in local community recovery and reconstruction, restoring their functions is a matter of utmost priority.

To support the recovery efforts of such local authorities, we provided telephones, Internet connections, PCs, LANs, multifunction printers, and other communications equipment required for them to function as they resumed operations.

We waived line relocation charges for people moving temporarily out of the disaster area.

We waived basic monthly charges for the approximately 2 million customers who were unable to use their lines because of equipment damage, or who were effectively unable to make calls because they had been forced to evacuate, and other similar reasons.

We also extended payment due dates by up to three months if requested to do so by customers.

We also provided communications systems at no charge to the temporary staff rooms of public schools that had been swept away or otherwise severely damaged by the earthquake and tsunami so as to help such schools to resume operations.

Providing communications to damaged public medical facilities

Many major local hospitals were damaged by the earthquake and tsunami. We supported local community health care by providing communications at no charge to hospitals that had lost the communications capabilities that they required to operate.

Supporting remote health consultations

We enabled people affected by the disaster to seek physical and mental health support by providing a system that connects temporary housing to medical facilities in the greater Tokyo area by videophone to conduct remote health consultations.

Providing communications to educational facilities

We provided communications systems at no charge to the temporary staff rooms of public schools that had been swept away or otherwise severely damaged by the earthquake and tsunami so as to help such schools to resume operations.

Providing job opportunities in the disaster area, etc.

We extended hiring for fiscal 2012 in both the disaster area and elsewhere from April 1 to June 1.

NTT East Group companies (four prefecture-based companies, NTT-ME, TelWel East Japan, NTT Solco) hired approximately 280 people in the disaster area.

We recruited additional new graduates for fiscal 2012 from among students whose job offers had been cancelled as a result of the disaster.

Preferential purchase of disaster area agricultural produce for company cafeterias

NTT East has been preferentially buying agricultural produce grown in Fukushima, Ibaraki, and Tochigi Prefectures and not subject to shipment restrictions for use at its company cafeterias.

Helping with live broadcasts of charity concerts

We used our FLET’S HIKARI fiber optic broadband service to help with high definition live broadcasts of charity concerts and sumo tournaments staged by other organizations in various locations to support recovery efforts.

Donations, etc.

- NTT East donated ¥100 million to the recovery efforts. (The NTT Group as a whole donated ¥1 billion.)
- FLET’S HIKARI Members Club invited its members to exchange points for donations from March 18 up to September 30. This resulted in 35,650 donations amounting to ¥512,650,000, all of which was passed on to the Japan Red Cross Society.
- NTT East is a sponsor of the Signal of Hope Fund established to support the early resumption of operations by Tohoku fishing ports.
- NTT East Badminton Team brings cheer to the disaster area

NTT East Badminton Team players and other personnel visited 12 sports facilities in Iwate, Miyagi, and Fukushima Prefectures between May 29 and June 5, 2011 to provide training workshops to elementary, junior high, and high school students. (5 locations in Iwate, 5 in Miyagi, 2 in Fukushima)
We have started working on full restoration of trunk lines and exchange buildings to improve the reliability of our provisionally restored communications network.

**Trunk lines**

We are subdividing trunk lines and establishing new inland routes in the tsunami damage area and nuclear power plant area.

- **Strengthening trunk line backup system by subdividing network loops**
  - We have long used a loop structure to secure two routes, but we are subdividing loops further by incorporating trunk lines within them to create a ladder-like structure.

- **Creating new inland routes in the tsunami damage and nuclear power plant areas**
  - We are diverting coastal trunk lines inland.

- **Laying new ducts under riverbeds in locations where cables strung along bridges were swept away or severed**
  - We are laying new ducts under riverbeds in locations where cables strung along bridges were swept away or severed.

**Exchange buildings**

We are moving exchange buildings that were swept away or submerged by the tsunami to higher locations and taking flood defense measures.

- **Relocation to higher ground**
  - We are moving buildings that suffered extensive tsunami damage and those that are liable to flood due to land subsidence to higher ground or inland locations.

- **Flood defense measures**
  - We are subdividing trunk lines and establishing new inland routes in the tsunami damage area and nuclear power plant areas.
  - We are building ducts to lay trunk lines across rivers.

We established seven field offices in Iwate, Miyagi, and Fukushima Prefectures, and brought together the company’s most capable and experienced employees to carry out front line restoration. Working in the disaster area is perilous, since aftershocks are still occurring, and so we are placing top priority on protecting the safety of all of our field workers as we endeavor to restore and reconstruct our networks in the coastal area as soon as possible.

By using restored facilities to simultaneously conduct stopgap restoration drills, we aim to offer communications services that people can rely on even during power outages and when disaster strikes. We will strive to contribute to the reconstruction of the region through leveraging ICT for safe and secure community development, disaster preparedness, healthcare, education, government, and many other areas of endeavor.

We will leverage lessons learned from the Great East Japan Earthquake to build even more reliable communications networks and fulfill our mission to connect people.

**Building disaster-resistant communications equipment**

We will carry out the following measures on trunk lines and exchange buildings in the East Japan area according to circumstances:

- Detours around areas vulnerable to disasters, and rebuilding of trunk lines in a way that will minimize disaster impacts
- Reinforcement of power supply equipment in exchange buildings
- Exchange building quakeproofing and floodproofing improvements

**Ensuring rapid restoration of services**

- **Prompt operation of satellite devices**
  - Deployment of portable emergency switching equipment capable of handling FLET’S and other new services in addition to conventional fixed lines so as to enable flexible expansion and upgrading of alternative devices in the event that exchange buildings suffer disaster damage
  - Development of portable earth stations capable of automatic satellite acquisition, and upgrade and increased distribution of wireless disaster countermeasure devices
  - Utilization of geographical information systems (GIS) for ascertaining impacts in disaster situations and promptly providing customers with accurate information

**Assisting communication when disasters strike**

- **Rebuilding Tohoku**
  - Hidefumi Matsuda, Engineering Promotion Manager, Tohoku Future Network Design and Reconstruction Office, NTT East

We are working on full restoration of communications equipment in the disaster area to regain the former reliability of our networks and build a disaster-resistant communications infrastructure.

We have started working on full restoration of trunk lines and exchange buildings to improve the reliability of our provisionally restored communications network.

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  - We are building ducts to lay trunk lines across rivers.

We will work with convenience stores and other facilities equipped with fiber optic lines to enable Wi-Fi-based Internet access, and prepare the ground for operation of “information stations” in disaster situations through the prior deployment of emergency use public phone lines. We will also look into the establishment of such information stations at designated evacuation sites so as to enable the prompt provision of communications.
**Restoration and reconstruction timeline**

<table>
<thead>
<tr>
<th>Nationwide events in Japan</th>
<th>NTT East key actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>March 11</strong></td>
<td>Earthquake in Miyagi Prefecture, NTT East announces successful restoration of buildings in the Tohoku region.</td>
</tr>
<tr>
<td></td>
<td>Operations of all NTT East facilities suspended for the rest of the day.</td>
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<tr>
<td></td>
<td>Tokyo Expressway closed.</td>
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<td></td>
<td>Fukushima Dachi nuclear power plant evacuation zone expanded to 20 km radius.</td>
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<tr>
<td></td>
<td>Fukushima Dachi No.3 reactor heat generation explosion.</td>
</tr>
<tr>
<td></td>
<td>TEPCO announces planned blackouts.</td>
</tr>
<tr>
<td><strong>March 12</strong></td>
<td>Earthquake with a seismic intensity of 6.0 strikes northern Nagano Prefecture.</td>
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<td></td>
<td>Phone call restrictions lifted.</td>
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<tr>
<td></td>
<td>Announcement of basic monthly charge waiver and other deductions and exemptions for disaster area lines.</td>
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<tr>
<td></td>
<td>Communications services damage peakas, with approx. 1.5 million lines down.</td>
</tr>
<tr>
<td><strong>March 13</strong></td>
<td>Disaster Containment Office set up.</td>
</tr>
<tr>
<td></td>
<td>Network restoration is under way in Tohoku, Ibaraki, Tochigi, Fukushima, Yamanashi, Iwate, and Miyagi, forcing us to restrict traffic (maximum 90%)</td>
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<tr>
<td></td>
<td>Disaster Emergency Broadband Message Board (Web 171) operation launched.</td>
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<tr>
<td></td>
<td>Disaster Emergency Message Dial (171) operation launched.</td>
</tr>
<tr>
<td></td>
<td>All public phones in the Tohoku region are available for free usage.</td>
</tr>
<tr>
<td></td>
<td>Damage of power supply facilities started.</td>
</tr>
<tr>
<td></td>
<td>Installation of emergency use public phones started.</td>
</tr>
<tr>
<td><strong>March 14</strong></td>
<td>Earthquake with a seismic intensity of 6.0 strikes northern Nagano Prefecture.</td>
</tr>
<tr>
<td></td>
<td>Fukushima Dachi nuclear power plant evacuation zone expanded to 20 km radius.</td>
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<td>Fukushima Dachi No.3 reactor heat generation explosion.</td>
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<td>TEPCO announces planned blackouts in Ibaraki, Chiba, and other prefectures.</td>
</tr>
<tr>
<td><strong>March 15</strong></td>
<td>TEPCO announces planned outages in Ibaraki, Chiba, and other prefectures.</td>
</tr>
<tr>
<td></td>
<td>Earthquake with a seismic intensity of 6.0 strikes eastern Shizukuishi Prefecture.</td>
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<tr>
<td></td>
<td>MTR earthquake with a seismic intensity of 6.0 strikes eastern Shizukuishi Prefecture.</td>
</tr>
<tr>
<td><strong>March 16</strong></td>
<td>Issuance of relief supplies to Sendai Airport started.</td>
</tr>
<tr>
<td></td>
<td>Advice issued via media for subscribers to disable call blocking so as to receive calls from the disaster area.</td>
</tr>
<tr>
<td><strong>March 18</strong></td>
<td>Provision of free public Wi-Fi access (FLET’S SPOT, etc.) started in Iwate, Miyagi, Yamanashi, Fukushima, Ibaraki, and Nagano.</td>
</tr>
<tr>
<td></td>
<td>Exchange of FLET’S HIKARI Members Club points for Tohoku-Pacific Ocean Earthquake-related donations started.</td>
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<tr>
<td></td>
<td>Disaster Emergency Message Dial message recording expanded from the disaster area to nationwide. (Recording from mobile phones enabled)</td>
</tr>
<tr>
<td><strong>March 20</strong></td>
<td>Announcement of prolongation of recruiting activities in conjunction with the Tohoku-Pacific Ocean Earthquake.</td>
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<tr>
<td><strong>March 21</strong></td>
<td>Government bans shipment of spinach and kale from Fukushima, Ibaraki, Tochigi, and Gunma Prefectures.</td>
</tr>
<tr>
<td><strong>March 22</strong></td>
<td>Government bans shipment of spinach and kale from Fukushima, Ibaraki, Tochigi, and Gunma Prefectures.</td>
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<tr>
<td></td>
<td>An announce that restoration of over half of the 97 buildings damaged in the Tohoku region will require considerable time. (Damaged line approx. 160,000)</td>
</tr>
<tr>
<td><strong>March 25</strong></td>
<td>Installation of free internet access points in evacuation centers announced. (Complete installation at 173 locations by March 26)</td>
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<tr>
<td></td>
<td>Add green areas, such as fountains and parks, to areas where free public Wi-Fi access (FLET’S SPOT, etc.) is available.</td>
</tr>
<tr>
<td><strong>March 28</strong></td>
<td>TEPCO’s planned blackouts effectively terminated on this day.</td>
</tr>
<tr>
<td><strong>March 30</strong></td>
<td>The NTT Group (NTT, NTT DOCOMO, NTT East, etc.) announces Tohoku-Pacific Ocean Earthquake-related damage, restoration status, and outlook. President announces that stoppage restoration will be completed at the end of April.</td>
</tr>
</tbody>
</table>

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<td><strong>April 1</strong></td>
<td>The March 11 earthquake is officially named the Great East Japan Earthquake by a Cabinet decision.</td>
</tr>
<tr>
<td></td>
<td>Announcement of blank page of monthly charge invoices in areas which suffered damage disabled phone area and other services as determined by NTT East.</td>
</tr>
<tr>
<td></td>
<td>Earthquake with a seismic intensity of upper 6.0 and epicenter off the coast of Miyagi Prefecture.</td>
</tr>
<tr>
<td></td>
<td>Tohoku-Shinkansen bullet train service restored.</td>
</tr>
<tr>
<td></td>
<td>TEPCO announces termination of planned blackouts.</td>
</tr>
<tr>
<td><strong>April 10</strong></td>
<td>Tohoku Expressway completely reopened.</td>
</tr>
<tr>
<td><strong>April 13</strong></td>
<td>Sendai Airport reopened.</td>
</tr>
<tr>
<td><strong>April 14</strong></td>
<td>Restoration work carried out on the Iwaki Tomioka Building in the nuclear power plant area.</td>
</tr>
<tr>
<td><strong>April 15</strong></td>
<td>Provision of remote health consultations at evacuation centers, etc. using videophones announced. (Provided in the cities of Minami-Iwaki from August, and Toza from September.</td>
</tr>
<tr>
<td><strong>April 21</strong></td>
<td>26 km radius zone established around Fukushima Dachi nuclear power plant.</td>
</tr>
<tr>
<td><strong>April 27</strong></td>
<td>As it explained at the end of March, the NTT Group (NTT, NTT DOCOMO, NTT East, etc.) announces completion of stoppage restoration of buildings by the end of April excluding certain exceptional areas. Also announces restoration on April 13 of the Iwaki Tomioka Building in the nuclear power plant area.</td>
</tr>
<tr>
<td><strong>May 6</strong></td>
<td>Communications services (Analog W, Digital) (ISDN, FLET’S HIKARI) restored in all exchange buildings except 3 buildings on offshore islands in Miyagi Prefecture, and 3 buildings in the Fukushima nuclear power plant area.</td>
</tr>
<tr>
<td><strong>May 13</strong></td>
<td>Announcement of full restoration schedule, disaster damages, and establishment of the Tohoku Future Network Design and Reconstruction Office in our results for the fiscal year ended March 31, 2011.</td>
</tr>
<tr>
<td></td>
<td>Disaster area group companies (NTT East, NTT East, NTT East, NTT East, NTT East, NTT East, NTT East, NTT East, NTT East) announce plans to be approximately 100 new offices.</td>
</tr>
<tr>
<td><strong>May 16</strong></td>
<td>Establish the Tohoku Future Network Design and Reconstruction Office as an organization reporting directly to the president.</td>
</tr>
<tr>
<td><strong>May 23</strong></td>
<td>More for “Correcting to Tomorrow” events involving the players and staff of the NTT East-Budouzian Team announced. (held from May 29 in Iwate, Miyagi, and Fukushima)</td>
</tr>
<tr>
<td><strong>May 25</strong></td>
<td>Partial Wing of bus on shipment and consumption of vegetables grown in Fukushima Prefecture.</td>
</tr>
<tr>
<td><strong>June 14</strong></td>
<td>Disaster area group companies (NTT Solo) announces plan to hire 55 people from the area.</td>
</tr>
<tr>
<td><strong>July 6</strong></td>
<td>Announcement of launch of cooperation with Seven &amp; I Holdings to provide free HIKARI (FLET’S) IP access to 500 temporary housing (shopping support), and to equip Seven-Itoh Shonan store with Wi-Fi access so that they can serve as information stations when disaster strikes.</td>
</tr>
<tr>
<td><strong>July 20</strong></td>
<td>Oshiwara area in Miyagi Prefecture restored.</td>
</tr>
<tr>
<td><strong>August 29</strong></td>
<td>Disaster Emergency Message Dial (171) service terminated.</td>
</tr>
<tr>
<td><strong>September 2</strong></td>
<td>Yoshihiko Noda’s cabinet inaugurated.</td>
</tr>
<tr>
<td><strong>September 4</strong></td>
<td>Functions of three buildings in the Fukushima nuclear power plant area restored.</td>
</tr>
<tr>
<td><strong>September 26</strong></td>
<td>Entire area in Miyagi Prefecture restored.</td>
</tr>
</tbody>
</table>