

# Effectiveness of 'Electrical Safety Management Service' proven by the Great East Japan Earthquake

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# Information on Electrical Safety Inspection Associations Nationwide and the Tohoku Electrical Safety Inspection Association

■ There are 10 Associations in Japan from Hokkaido to Okinawa.



## Operation Details (Safety management operations)

- Reviews of electrical facility designs, and inspections during construction and after completion.
- Regular inspections (monthly, annually) and provisional inspections
- Emergency actions during accidents, and recurrence prevention actions
- Stand in as witness to inspections conducted by government agencies
- Guidance and consultation regarding electrical safety

Reference: Number of contract safety management operations

Nationwide contracts	Approx. 389,000
Tohoku contracts	Approx. 54,000 (14% of nationwide)

(As of Mar. 31, 2016)



## Subject

Safety services were effectively employed during  
the Great East Japan Earthquake.

-- Readiness for ensuring continuity of operations --

- I. Overview of the earthquake and damage caused
- II. Recovery
- III. Disaster response actions carried out by the  
Tohoku Electrical Safety Inspection Association
- IV. Readiness for ensuring continuity of operations  
(for customers)

## I-1 Overview of the earthquake and damage caused

### ■ When

2:46 pm,

Friday, March 11, 2011

### ■ Where

Off the Sanriku coast at a depth of 10 km

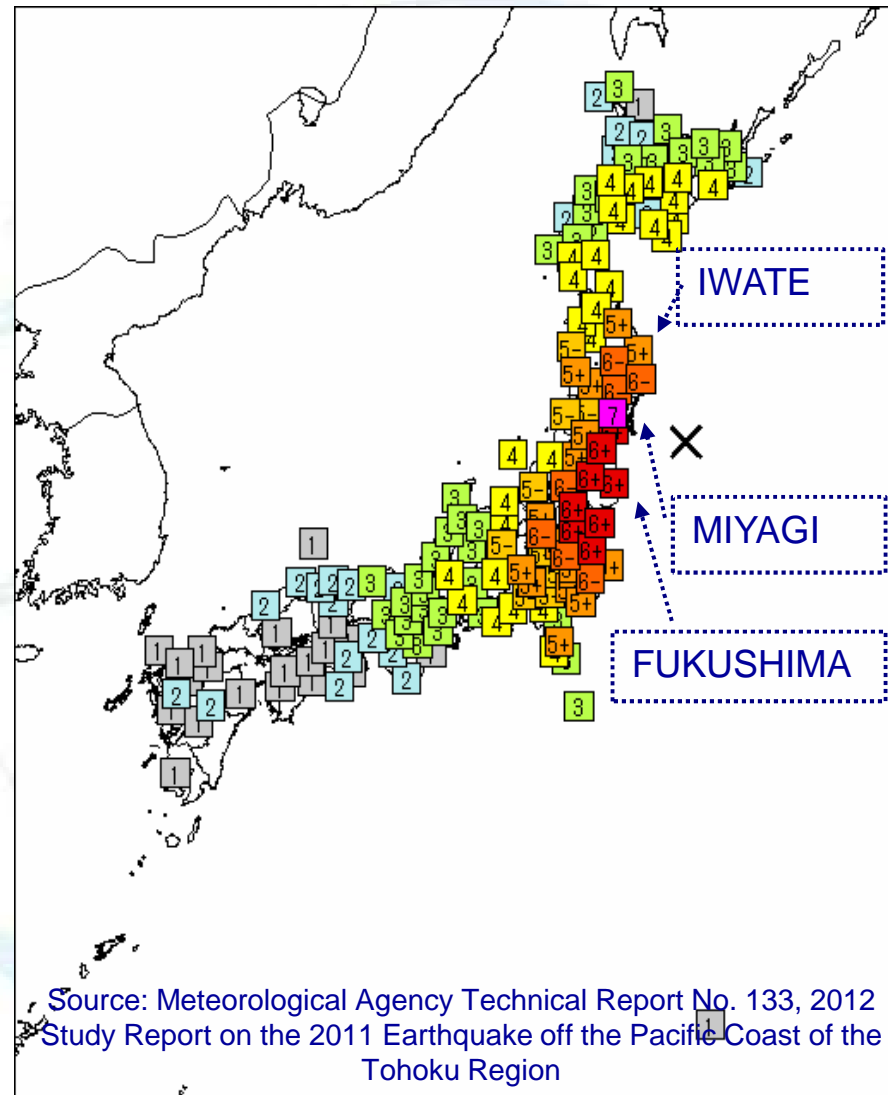
Magnitude 9.0

### ■ Earthquake intensities recorded in different regions

Intensity 7: MIYAGI

Intensity 6-plus: FUKUSHIMA

Intensity 6-minus: IWATE



## I-2 Overview of the earthquake and damage caused: Regions with particularly extensive damage.

Example: Regions with particularly extensive damage

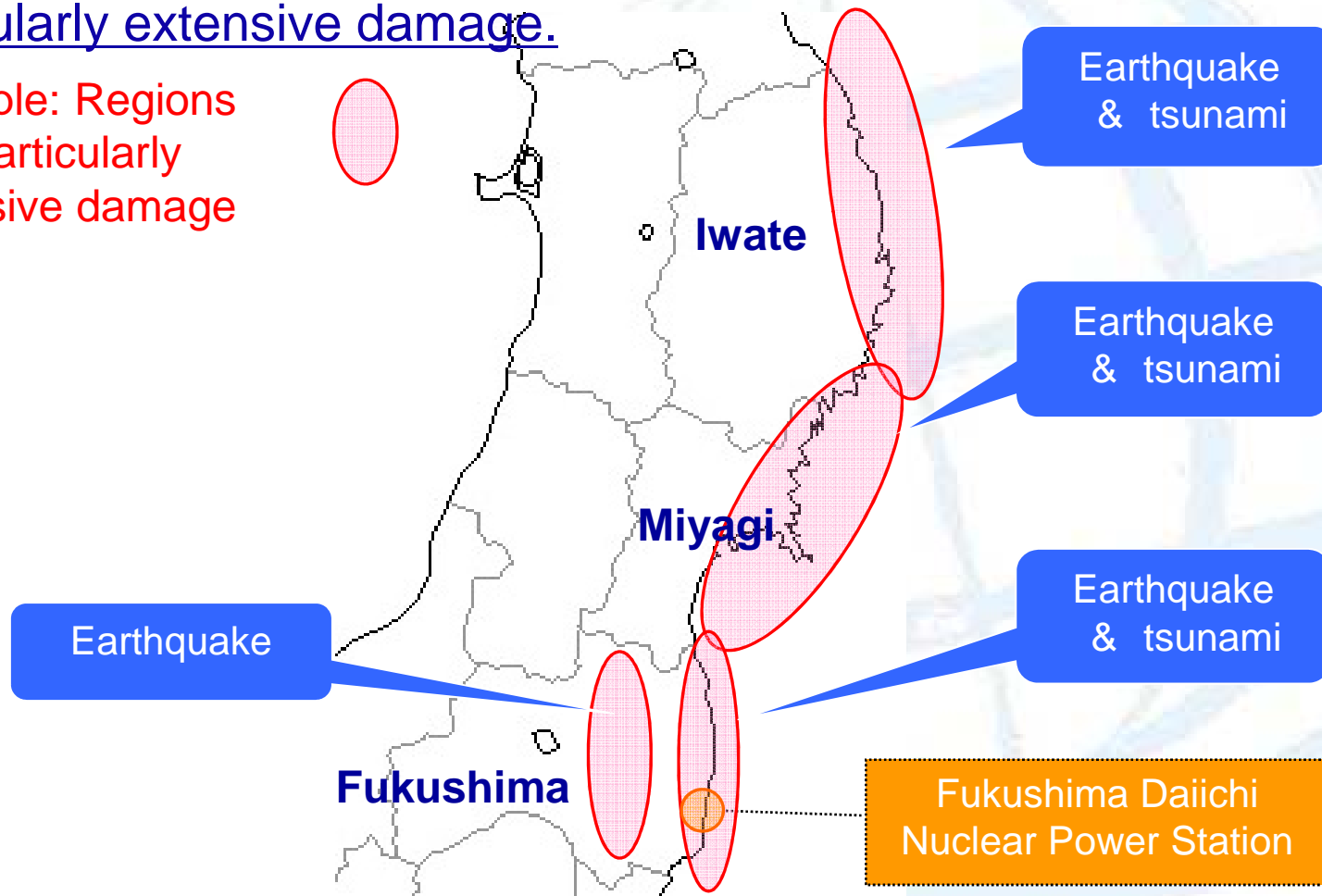




Photo of the aftermath of the earthquake and tsunami 03.11.2011



## I-3 Damage sustained by Safety Association customers

### ■ Estimated damages

a. Total: Approx. 21,500 sites

(b. Contract sites: Approx. 53,000)

About 40% of contract sites  
sustained damage

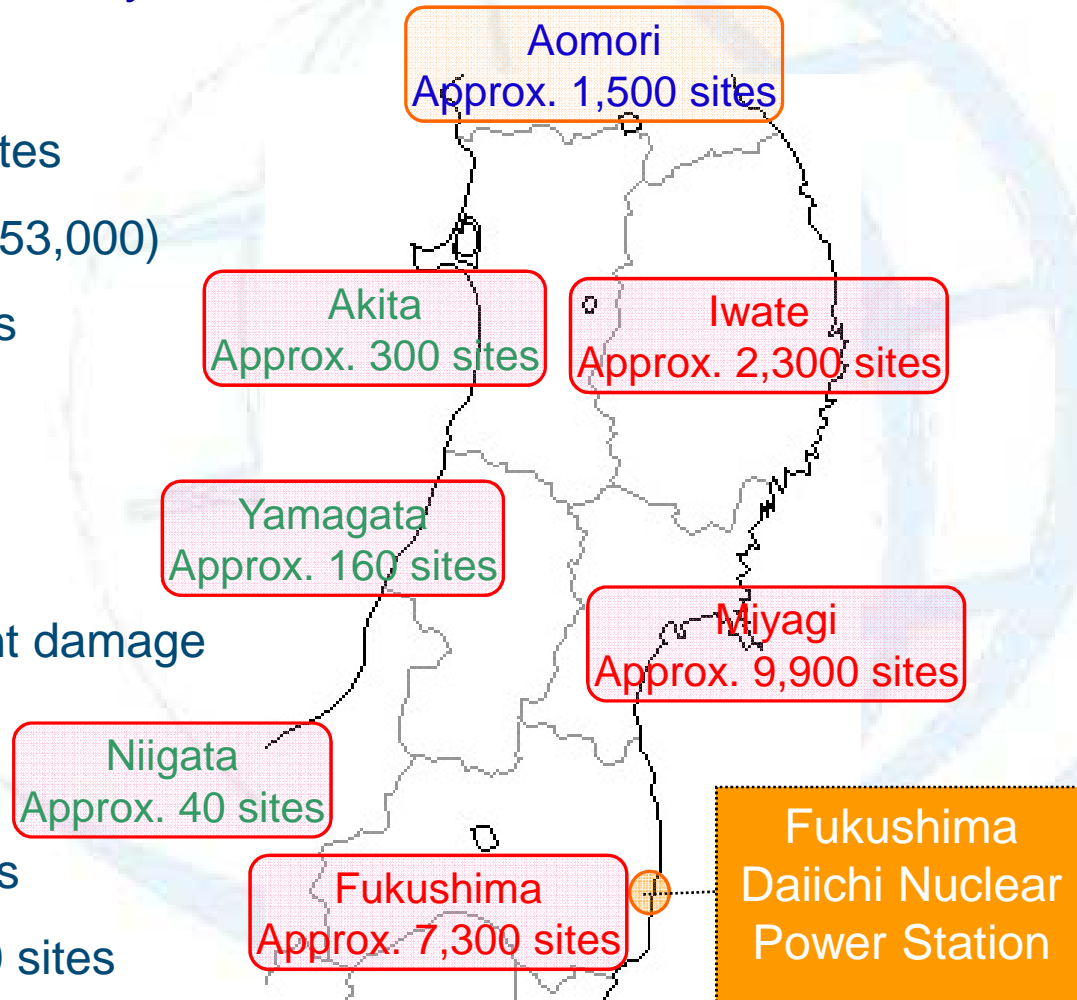
(As of Feb. 28, 2011)

### ■ Prefectures with significant damage estimates

Iwate: Approx. 2,300 sites

Miyagi: Approx. 9,900 sites

Fukushima: Approx. 7,300 sites





## II-1 Recovery through support dispatches

■ First dispatch, 20 crews, 40 members: Mar. 14-17

■ Second dispatch, 30 crews, 60 members: Mar. 18-21

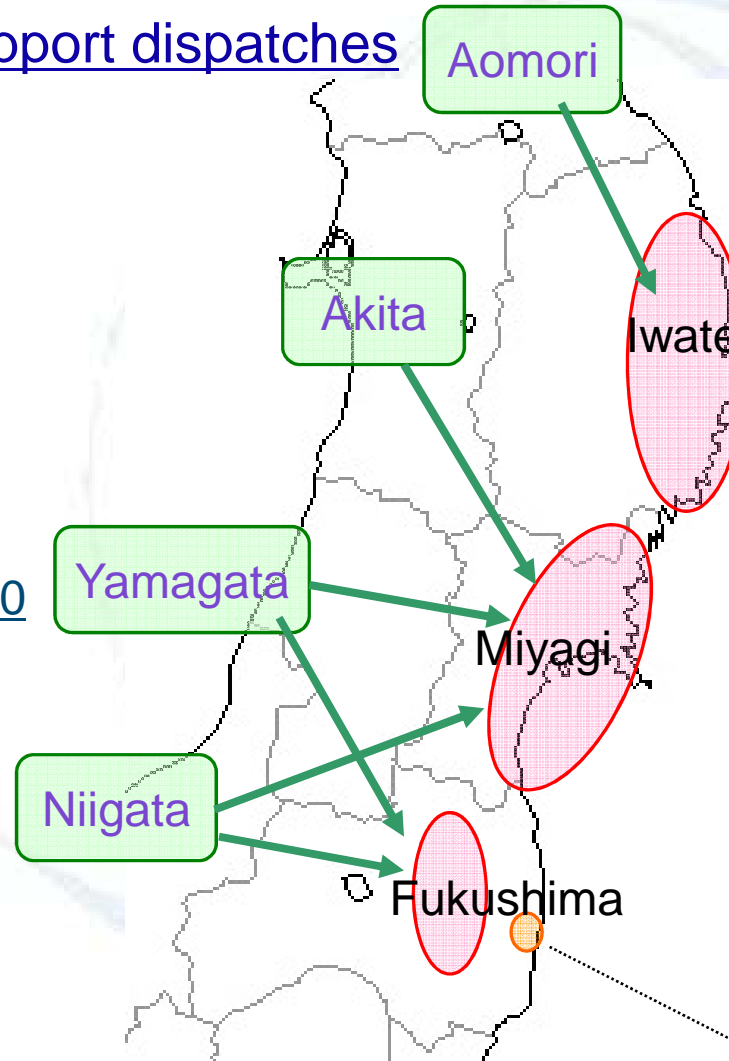
☆ Mar. 14-21

First and second dispatches

Total of 200 crews, approx. 400 members

[1] Emergency vehicle registration

[2] Loaded with supplies of food, gasoline, etc.



Iwate  
 First dispatch, 2 crews, 4 members

Miyagi  
 First dispatch, 12 crews, 24 members  
 Second dispatch, 18 crews, 36 members

Fukushima  
 First dispatch, 6 crews, 12 members  
 Second dispatch, 12 crews, 24 members

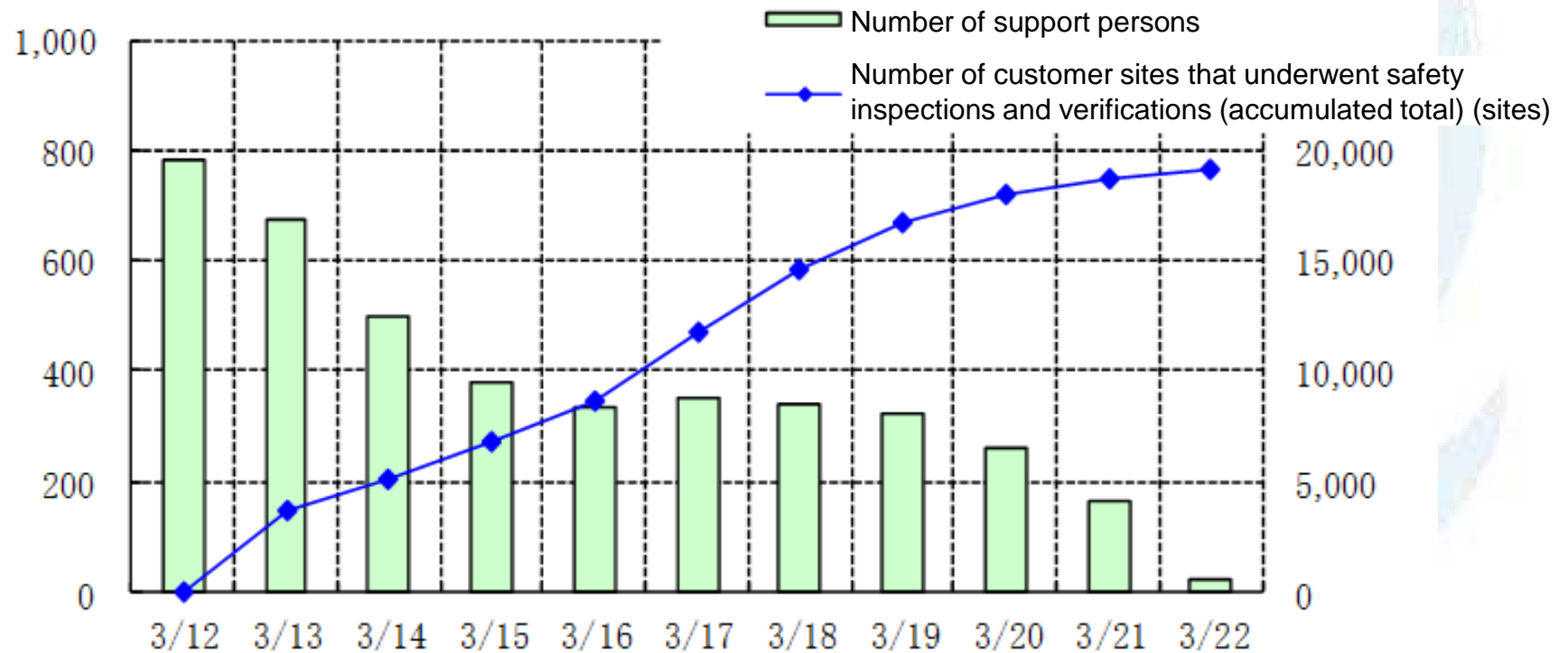
Fukushima Daiichi Nuclear Power Station

## II-2 Recovery status of contract business sites that operate electrical facilities for private use

Mar. 22, approx. 21,500 sites ⇒ **Recovery was complete by this time**, except for approx. 2,600 customers sites where inspections could not be performed.

\* Sites where inspections could not be performed included customers who sustained damage to their facilities, were not accessible due to roads being cut off, or were located in no-entry zones that were cordoned off due to the nuclear power plant accident.

Number of persons (persons)



## II-3 Photo of a safety inspection, and verification/recovery operation

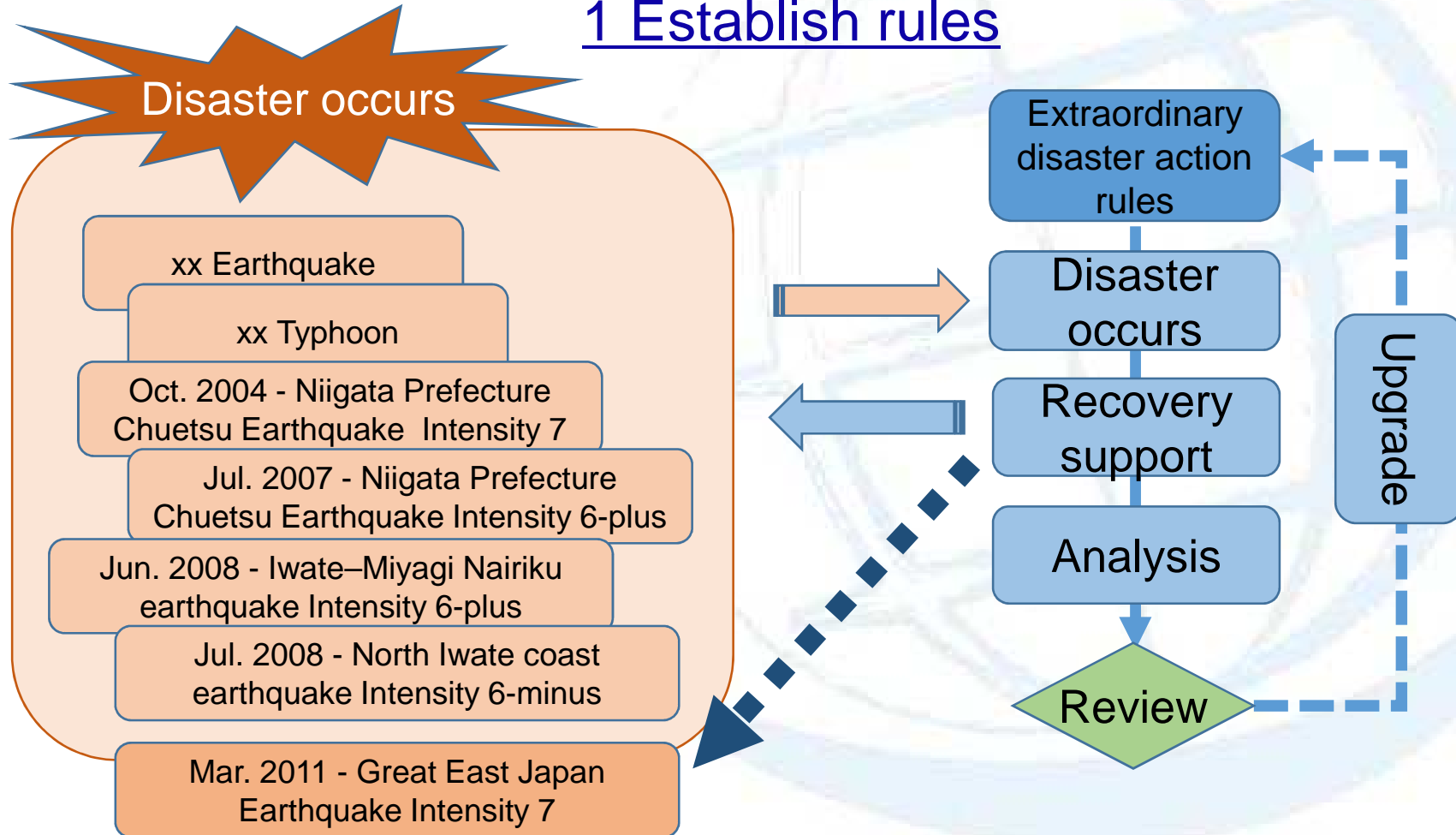


Symposium Fisuel – Indonésie – 10 & 11 Mai 2017

Fisuel Symposium – Indonesia – 10th & 11th of May, 2017

### III Disaster response actions carried out by the Tohoku Electrical Safety Inspection Association

#### 1 Establish rules





## III Disaster response actions carried out by the Tohoku Electrical Safety Inspection Association

### 1-1 "Initial response services setup" -- Examples of upgrades and improvements made --

■ Rule stipulating that, in the event of an earthquake of intensity 6-minus or greater, all members are to arrive at the office "automatically" without waiting for instructions.

⇒ Based on past experience that earthquakes with intensities above 6 will cause significant damage to facilities. (Quickly establish emergency services setup)

■ Implementation of safety verification system (after the Great East Japan Earthquake)  
Safety of employees comes first.

⇒ Program automatically sends emails to employees.  
Information is tallied automatically based on standardized text replies.  
(Quickly ascertain safety)

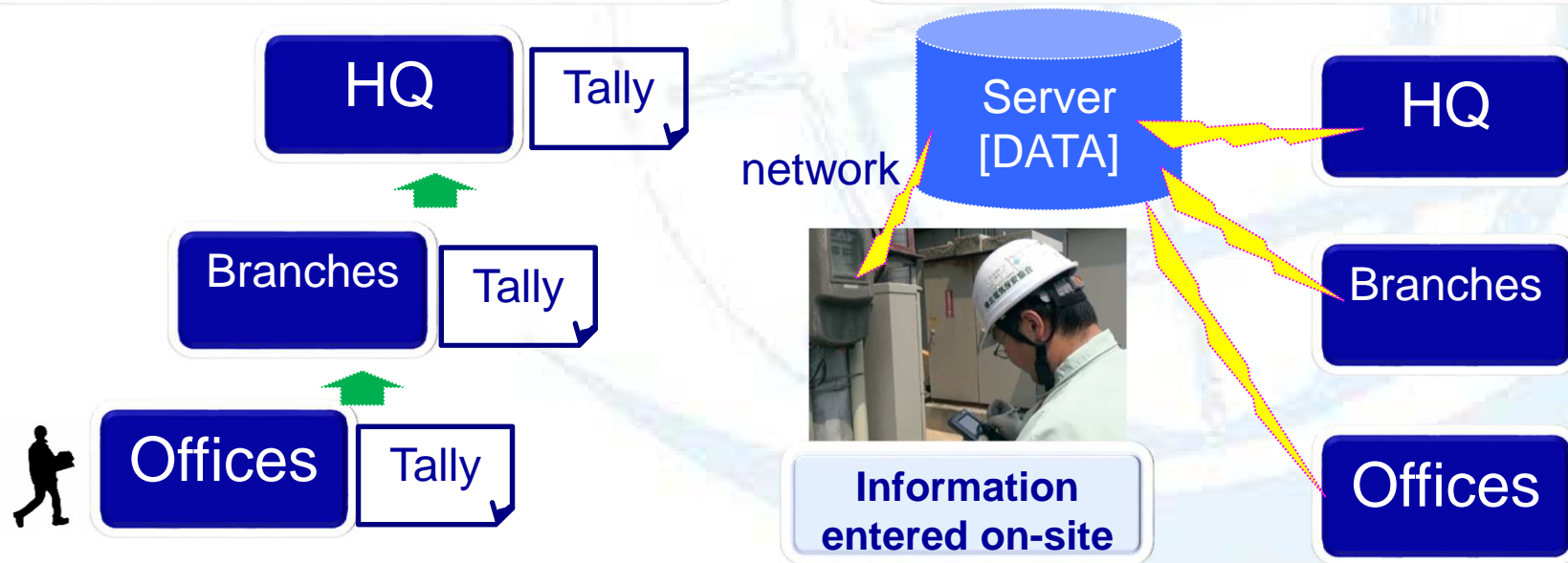


### III-1-2 "Information gathering and progress management" -- Examples of upgrades and improvements made --

■ Systemization of tallying operations (Expedite progress management and support setup)

Inspectors tally and report after they return to the office ⇒ Manual tallying

Inspectors enter information on-site on a mobile terminal ⇒ Automatic tallying



### III-1-3 "Recovery operations" -- Examples of upgrades and improvements made --

- Verify total number of customers estimated to have sustained damage.

[Focus on verification and recovery operations]

⇒ Recovery operations were being carried out based on information provided by customers and power companies. No incoming communication available from unmanned facilities and sites that were on holiday. As a result, power outages went undetected, delaying recovery operations.

[Conduct verification and recovery + safety inspections]

⇒ Visit all customer sites that are estimated to have sustained damage, and carry out "safety inspections" which includes inspections of electrical facilities.  
\* Recovery operations were completed in shorter amounts of time, improving the level of quality for customers.

## III Disaster response actions carried out by the Tohoku Electrical Safety Inspection Association

### 2 Preparing supplies and equipment

#### ■ Organizing the services setup chart, etc.

- Set up a disaster response HQ. Create a services setup chart showing PICs and descriptions of operations.
- Create an emergency communication schematic, etc. for extraordinary disasters.

#### ■ Preparing supplies and equipment when a disaster occurs

- Secure items including drinking water, emergency food, lights (including spare batteries), maps, stoves, mobile generators, and fuel, etc.

#### ■ Organizing telecommunication lines

- Implement satellite mobile phones which are then issued to all branches (after the Great East Japan Earthquake)
- Upgrade the simple communication radios (to units with higher output)

## III Disaster response actions carried out by the Tohoku Electrical Safety Inspection Association

### 3 Ongoing training

#### Conduct extraordinary disaster training and other forms of training.

Conduct once a year  
 Based on a scenario of working in an earthquake stricken area  
 (Earthquake intensity 6-plus, etc.)

**Overall training** → Establishing services setup, information communication, and inspection consolidation

**Individual training** → Safety verification, and inspection of emergency supplies and equipment



## IV Readiness for ensuring continuity of operations (for customers)

▼ Operations have stopped due to power outage caused by the disaster! (Difficult to carry on operations)

→ How can we avoid or mitigate these situations?

■ Preventive safety is critical! (Continuity of operations)

- Upgrade to electrical facilities that are more robust against disasters. \* Some examples shown below.
- Update old facilities (whose materials have undergone changes or degradation from aging)

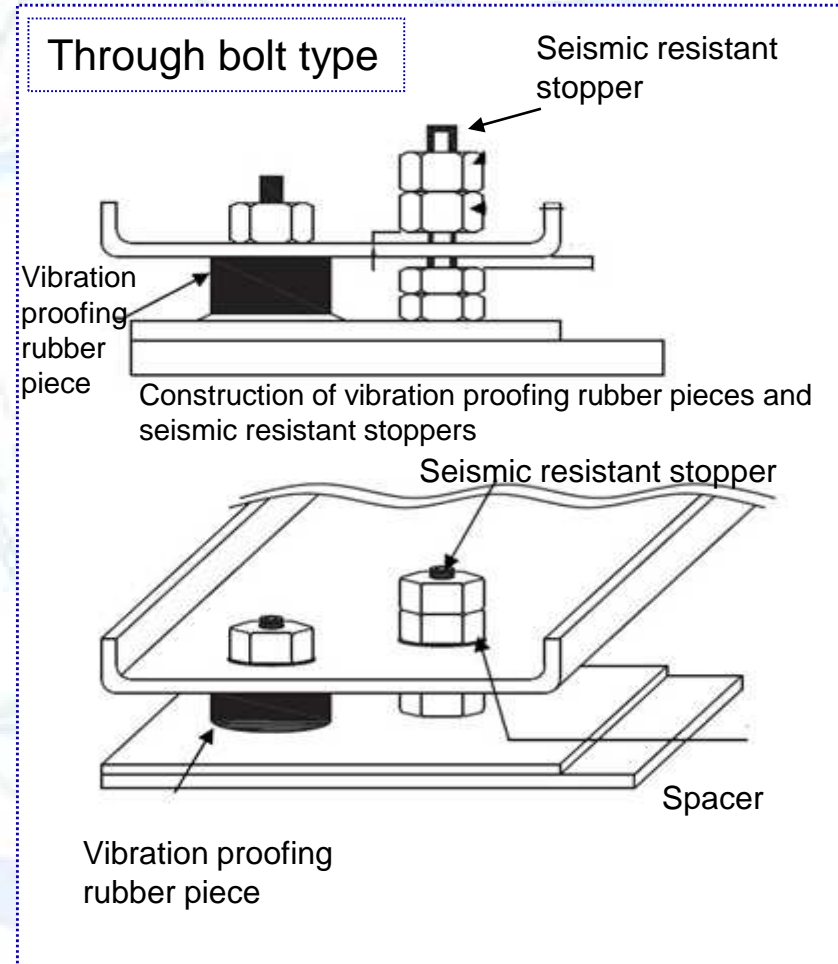
And other concerns.



## IV-■ Preventive safety Install electrical facilities that are more robust against disasters

Examples of earthquake countermeasures (seismic resistance)

- Electrical facilities including transformers and power capacitors, etc.  
 ⇒ Measures to prevent them from moving, tipping over, and falling, etc.
- Choosing the appropriate anchor bolts, and installing the equipment onto solid foundations.
  - Retightening of existing anchor bolts



## IV-■ Preventive safety Install electrical facilities that are more robust against disasters

Examples of earthquake countermeasures (seismic resistance)

High and low voltage lines in cubicles

⇒ Measures to prevent line breakage caused by vibration

- Appropriate amount of slack on the lead lines
- Outgoing lines made of flexible conductors



Create slack on the wiring

Use flexible conductors



## summary

Items	Points
1 Quickly establish emergency services setup	<ul style="list-style-type: none"> <li>▪ Automatic office arrival rule (Intensity 6-minus or greater)</li> <li>▪ Install an extraordinary disaster countermeasures HQ</li> <li>* Verify safety and secure means of communication</li> </ul>
2 Establish a support services setup	<ul style="list-style-type: none"> <li>▪ Set up a database for quickly ascertaining the state of damage</li> <li>▪ Organize a self-sustaining support services setup, as well as prepare supplies and equipment (Prepare equipment and food, etc. to load on to vehicles)</li> </ul>
3 Clearly establish recovery tasks	<ul style="list-style-type: none"> <li>▪ Verifications and recovery through individual support</li> <li>▪ Conduct safety inspections for all presumed customers</li> </ul>
4 Establish rules and carry out ongoing training	<ul style="list-style-type: none"> <li>▪ Upgrade rules in light of disaster response, and prepare supplies and equipment</li> <li>▪ Conduct precise training based on rules (ongoing)</li> </ul>
5 Preventive safety (for customers)	<ul style="list-style-type: none"> <li>▪ Upgrade electrical facilities to those that are robust against disasters</li> <li>▪ Update old facilities</li> </ul>

**THANK YOU**

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