# Japan earthquake and tsunami
# Situation Report No. 7
# 16 March 2011
# As of 14:30 hrs Manila time

World Health Organization
Western Pacific Region

**All times stated below are in Tokyo time.**

## SITUATION SUMMARY

- A 9.0 magnitude earthquake (updated from the 8.8 magnitude by Japan Meteorological Agency on 13 March) occurred on 11 March 2011 in Japan at 5:46:23 GMT, hitting the northeast coast of Honshu, Japan.

- Based on official Japanese government figures, 3 573 people are confirmed dead, 1 990 injured with more than 7 558 missing. Figures are expected to rise. Various media sources reported more than 15 000 estimated deaths.

- There are 23 300 people stranded.

- 43 9335 people have been evacuated and rescue operations are ongoing.

- There has been some improvement in the provision of electricity. 621 439 households remain without electric power (compared to 864 700 without power 15 March). Scheduled limited power outages started on 15 March and are continuing in the Kanto area, including Tokyo.

- According to various media sources, hospitals have reported challenges with limited power, scarcity of medicines and lack of other resources.

- Ten nuclear reactor units automatically shut down after the earthquake in three separate nuclear power plants, Onagawa, Fukushima Daiichi and Fukushima Daini. The automatic shut down went as planned for the Onagawa plant.
    - The problems with the cooling systems in both Fukushima Daiichi and Fukushima Daini continue. Temporary measures for the cooling systems are in place. The state of emergency declared still remains.
    - Reactor No. 3: On 16 March at approximately 1000 hrs white smoke was detected and is continuing. Investigations into the extent of the damage is being undertaken.
    - Reactor No. 4: A fire was reported early on 16 March, but appears to have ceased.
    - Radioactivity has been detected outside the units in Fukushima Daiichi. The highest radiation levels reached were 8 217 microsieverts per hour near the front gate of the Fukushima No.1 nuclear power station at 08:31 am 15 March.

On 16 March at 11:00 am, measurements at the facility decreased to 3 391 micro Sv (3 milli Sv).
  - The evacuation zone is 20 km for Fukushima Daiichi plant and 10 km for Daini plants. All persons within the 20 km zone have been evacuated.
  - People residing between 20 to 30 km of the Daiichi plant (No. 1) are advised to stay indoors and avoid the use of ventilator systems.
  - 750 staff from the reactor have been evacuated and 50 staff remain to continue injecting water to cool the reactors.
  - A hospital in Fukushima has been designated for responding to persons potentially exposed to radiation.
  - Reactors 5 and 6 are confirmed to have an increase in temperature.

- A 6.4 magnitude earthquake occurred in Kanto region late 15 March. There were no casualities reported and no damage to Hamaoka nuclear power plant near the affected area. This earthquake is not related to the 9.0 magnitude earthquake reported on the 11 March.

## EVENT INFORMATION

**Earthquakes**

A 6.4 magnitude earthquake occurred in Kanto region late 15 March. There were no causalities reported. This earthquake was not related to the 9.0 magnitude earthquake reported on 11 March.

**Tsunami**

The Wewak hospital in Papua New Guinea reported that there were no deaths at the hospital due to the tsunami. All patients were evacuated after the warnings were received. The hospital wards situated high off the ground were not damaged. Patients were safely returned the following day.

The pharmacy of Wewak hospital was badly damaged, its walls were destroyed and all the medicines in the pharmacy were washed away. Other areas that were damaged or destroyed include the cholera isolation ward, biomedical and engineering workshop, IT office and computers and the hospital ration store. Hospital functions have been reduced and they are only operating for emergencies. The hospital has not provided the cost of the damage.

Boram hospital in Wewak, East Sepik, Papua New Guinea reported damage of about K5 million (~USD 1.8 million) due to the tsunami (Media).

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| **Weather** | Overall wind direction from west to east is forecasted over the next few days in the Tohoku region. Very cold temperatures, near freezing are expected over the next few days. Snowing in central and western Tohoku region where majority of evacuation centers are located. |

## POPULATION STATUS

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| **Deaths** | 3 573<br>In addition, 200-300 dead bodies found in Sendai City<br>** Expecting more than 15 000 deaths in Tohoku region according to various media sources* |
| **Injured** | 1 990 |
| **Missing** | 7 538 |
| **Health:** | 33 designated disaster hospitals in Miyagi, Fukushima and Iwate are operating. |

## DISPLACED PEOPLE

There have been 439 335 people evacuated and 23 300 people stranded. The largest number of persons evacuated are from Miyagi (203 953) followed by Fukushima (131 665), Ibaragi (47 834) and Iwate 46 405.

According to media, there are 2 546 evacuation shelters (NHK). Some shelters have yet to receive relief supplies such as water and food. Relief efforts are being hampered by a shortage of gasoline for delivery vehicles.

Information from Minami-soma evacuation centre was reported by the media. It was reported that persons have been facing cold temperatures and that there were sufficient blankets but no heaters. Many of the evacuees were elderly persons and some have lost their daily medications (antihypertensives, diabetes medication, anti epilepsy and anti asthma). There were approximately 5-6 nurses per evacuation centre. People have been anxious about falling asleep because of fears of further aftershocks. Blankets, diapers and emergency shelters have been deployed, but many have not yet arrived on site.

The three prefectures most affected from the earthquake have the following populations: Miyagi (2 359 991), Fukushima (2 091 223) and Iwate (1 385 037). In the Tohoku region, based on estimates from 2004, a large proportion of the population are elderly. The largest age group was from the 50-54 year group (765 000 persons). In addition, 526 000 were 80 years or older.

## LIFELINE SERVICES

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| **Health care facilities** | 123 of the 141 hospitals designated for acute disaster emergencies remain fully operational in Tokyo and Tohoku; 1 of 7 hospitals in Sendai is operational. |
| **Communication** | 863 300 telephone lines remain out of service. 4 773 base stations of NTT, Soft Bank and KDDI mobile companies are not working. Telephone services remain variable; disaster messaging service is in operation through mobile phone providers. |
| **Electricity** | 621 439 households remain without power (compared to 864 700 households on 15 March) across Kanto and Tohoku regions. Scheduled limited power outages started on 15 March and are continuing in Kanto area, including Tokyo. |
| **Gas** | 467 773 households are without gas supply. Gas pipeline fires controlled in Ichihara City, Chiba on 13 March. |
| **Water** | 167 1570 households from 12 prefectures (compared to 1.4 million households from 13 prefectures on 13 March) are without running water; 4 prefectures have received running water since 13 March. The most affected prefectures: Miyagi, Fukushima, Yamagata, Iwate (limited information), Ibaraki, Tochigi, Chiba, Akita, Aomori. 200 000 bottles have arrived at evaluation centers and 1 514 000 food items were in route. |
| **Food** | Several ministries have instructed private companies to distribute food items and bottled water to Miyage, Iwate and Fukushima prefectures. 480 000 food items have arrived at evaluation centers and 2 132 000 food items were in route. |
| **Petrol** | 760 000 litres of petrol are being provided to Miyage, Iwate, Fukushima and Ibaraki. |
| **Roads/transport** | Damaged roads have been reported from Aomori, Miyagi, Yamagata, Akita, Tokyo, Ibaraki, Tochigi, Saitama, Gunma, Chiba, Iwate; 1 206 roads confirmed damaged (430 roads reported 13 March). Most affected prefectures are Chiba, Tochigi, and Ibaraki. Saitama has also confirmed major road damage on 14 March; assessments from Fukushima not completed.<br><br>East Japan Railway's bullet train and train services in the Tohoku region remain halted. |

Ports: Haneda airport reopened operations 03:37 am, 12 March. Narita International reopened 06:00 am, 12 March. Fukushima airport remained closed. Misawa, Ibaraki, Oodatenoshiro, and Sado airports are operational. Hanamaki airport has stopped regular services but a temporary service is in operation. Sendai airport has commenced operation for rescue flights only. All Japanese ports continue to be closed.

## INFRASTRUCTURE

**Buildings** Damaged buildings were reported from Hokkaido, Miyagi, Iwate, Fukushima, Yamagata, Akita, Tokyo, Ibaraki, Tochigi, Saitama, Gunma, Chiba, Kanagawa, Tokushima and Kochi prefectures. Greatest damage was reported in Fukushima, Miyagi, Iwate, Ibaraki, Yamagata prefectures. Total of 3 500 buildings confirmed completely destroyed (compared to 3 345 buildings (confirmed 15 March).

**Nuclear power plant** 10 nuclear reactors (of a total of 13 reactors) automatically shutdown in 3 power plants in Miyagi and Fukushima prefectures (see details below).

**Fires** Extensive fires in Miyagi prefecture are now under control; however, 3 large fires in Miyagi still continuing. Iwate prefecture reporting new fires. 258 fires have now been recorded (224 fires were reported 15 March), 250 have been controlled, eight ongoing.

## RADIATION AND NUCLEAR FACILITIES

Ten nuclear reactors (of a total of 13), automatically shutdown in three power plants. These three power plants are Onagawa (Miyagi), Daiichi and Daini (Fukushima). Daiichi and Daini are 11.5 km apart; Onagawa is ~100 km from Daiichi and Daini plants.

There is risk of further radiation leaks. All people within a 20 km radius have been evacuated from the towns of Okuma, Tomioka, Naraha, Futaba. People residing between 20 to 30 km of the reactor from Kawauchi village, Tamura city, Hirono town, Iwaki city, Iitate village, Minamisoma city, Katsurao village, and Namie town, are advised to stay indoors and avoid the use of ventilator systems, close windows and not to bring laundry hanging outside indoors. Of the 190 persons suspected of being exposed to radiation following Daiichi Reactor No. 1's explosion, 22 persons have been confirmed with detectable radiation levels.

Authorities are communicating by disaster prevention radio and wireless radio (NHK News).

## Onagawa

All three reactors  automatically shutdown. A fire at the facility has now been controlled. Environmental monitoring: higher radiation levels detected ~1300 hrs 13 March, but has since declined as of 1:00 pm, 14 March.

## Fukushima Daiichi ("No. 1"; Fukushima)

A total of six reactors are present. Three reactors shutdown automatically and three reactors shutdown manually after investigation. However, there have been at least two explosions and increased radiation levels have been detected at the facility.  At 10:22 am on 15 March, the measurements of radiation from the three reactors were recorded as 30 milli Sv (between Units 2 and 3), 400 milli Sv (Unit 3) and 100 milli Sv (Unit 4). These levels can have an impact on human health. On 16 March at 11:00 am, measurements at the facility decreased to 3 391 micro Sv (3 milli Sv) as displayed in below figure. The highest radiation levels reached were 8 217 microsieverts per hour near the front gate of the Fukushima No.1 nuclear power station at 08:31 am, 15 March.

750 staff from the reactor have been evacuated and 50 staff remain to continue injecting water to cool the reactors.

- Reactor No. 1:
    - Authorities initiated release of radioactive vapour in a controlled manner to reduce pressure to keep the temperature down (09:00 am, 12 March). Due to high levels of radiation and the possibility that workers could be exposed to radiation, the release was suspended at ~12:00 noon. Release of radioactive vapour was recommenced later on 12 March.
    - Water levels continued to drop, a radiation leak was detected and authorities suspected the melting of a portion of the reactor core.
    - Sea water was pumped in for cooling purposes on the evening of 12 March and water filling was complete.
    - Explosion and white smoke reported on 12 March was confirmed as a hydrogen reaction and not related to nuclear fission. The container was not damaged.
    - Sea water pumping was suspended 01:00 am, 14 March.
    - Sea water pumping currently operating, along with venting operations.

- Reactor No. 2
    - Cooling system reported to have failed in the afternoon of 14 March.
    - At 06:14 am, 15 March, there was a sound of an explosion after the explosion in unit 4. It is unlikely that the explosion was due to hydrogen as there was already a hole in

the unit. There is a high probability that part of the suppression pool chamber caused the blast and there was release of radioactive material.
    - Sea water pumping currently operating, along with venting operations (media).

- Reactor No. 3
    - The cooling water system failed in the morning of 13 March. A temporary cooling system was initiated at 09:08 am, 13 March. Venting to release excess pressure commenced at 09:20 am, 13 March.
    - Environmental monitoring: higher radiation levels were detected within the control room 1:30 pm.
    - Explosion reported at Reactor No. 3 on 1100 hrs 14 March was believed to be due to hydrogen reaction, and not due to nuclear reaction. Container not damaged.
    - 10 people reported to be injured due to explosion
    - On 16 March at approximately 10:00 am, white smoke was detected and is continuing. Investigations into the extent of the damage is being undertaken.
    - Sea water pumping currently operating, along with venting operations (media).

- Reactor No. 4
    - There was a sound of an explosion at 06: 00 am on 15 March due to hydrogen. A fire was observed at 09:38 am which was controlled at about 12:00 noon.
    - On 16 March 2011 at 05:45 am, it was confirmed that the building of the No. 4 reactor was on fire again. Fire appears to have ceased.
    - Sea water pumping and venting currently not operating (media).

- Reactors No. 5, 6
    - Reactors 5 and 6 are confirmed to have an increase in temperature; however the increase is not as high as reactor number 4, which is reported to be close to boiling.

## Fukushima Daini ("No. 2"; Fukushima)

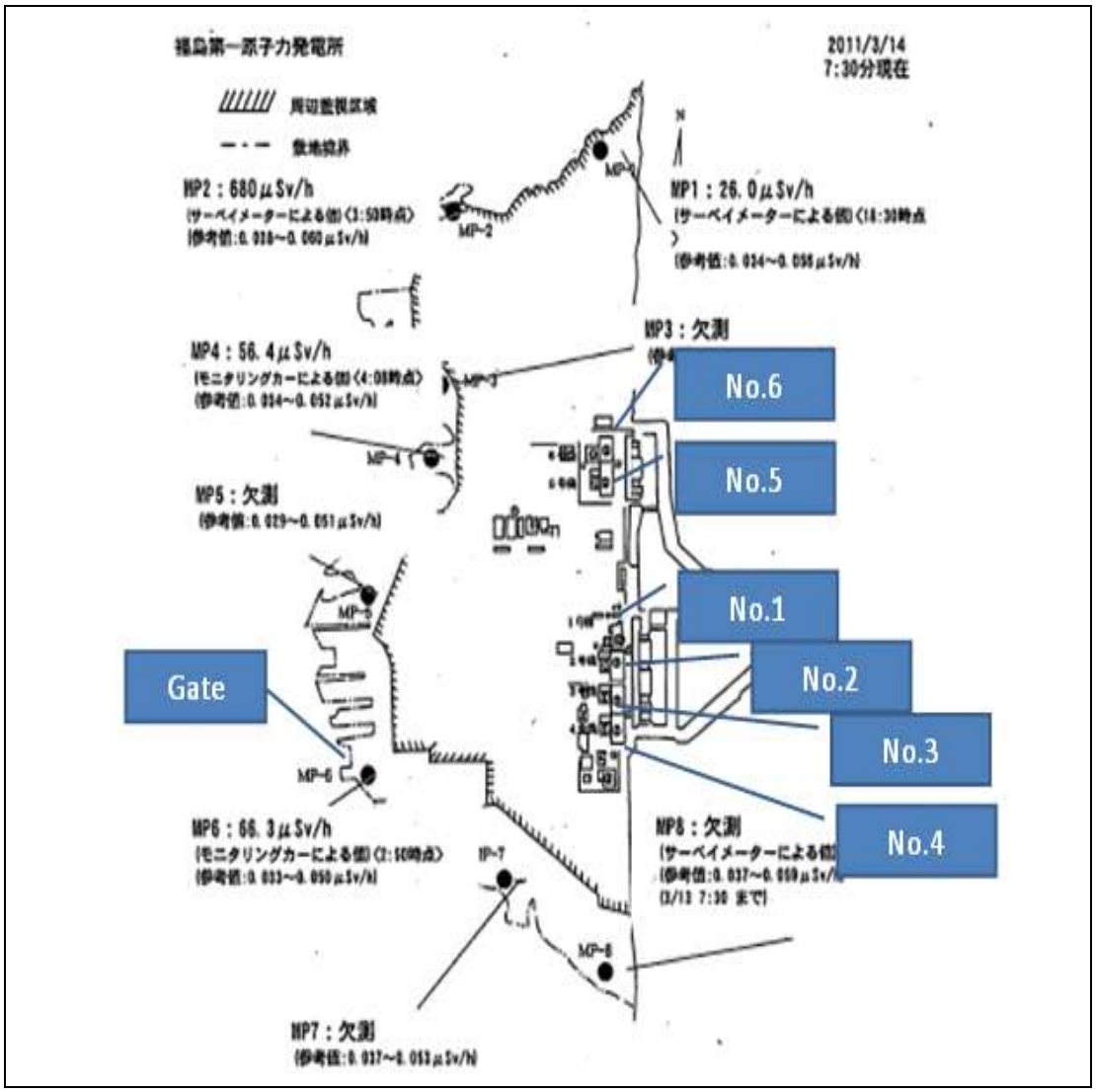
- All four reactors automatically shutdown.
- All four Daini reactors were able to maintain water levels.
    - No. 3 successfully shutdown; cooling system and water level are functioning properly.
    - No. 1, 2, 4—cooling system failed but temporary cooling system has been established and water level in the reactors has been maintained. Cooling system of No. 1 and 2 are now functioning and there is no information for reactor No. 4.
    - Environmental monitoring: no abnormality as of 05:00 am, 14 March.

## Radiation

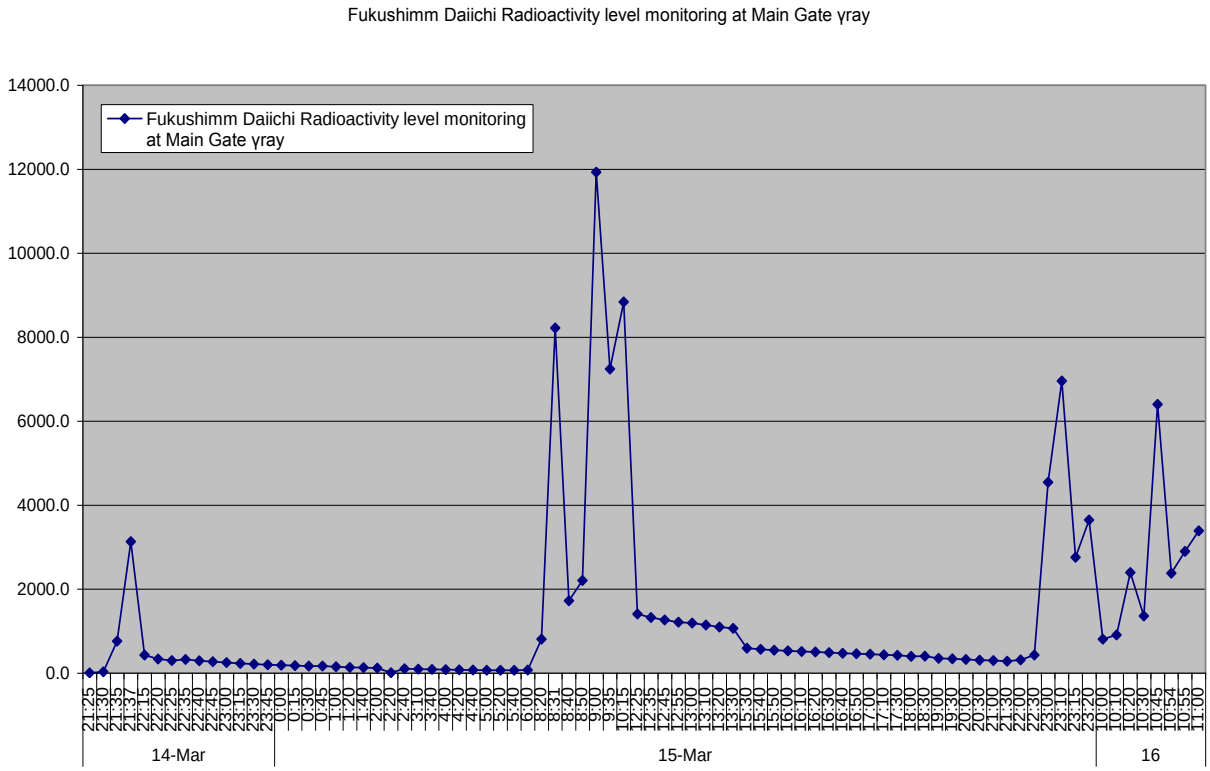
1.26 micro SV/hr detected in Kitaibaragi city Ibaragi at around 11 am, 0.76 micro Sv/hr in Hitachi city Ibaragi and 0.47 micro Sv/hr in Mito city Ibaragi. In addition Saitama, Kanagawa,

Tochigi, Chiba and Tokyo have reported slightly elevated levels of radiation in the morning of 15 March. There locations are south of the reactor. These levels are lower than exposure levels from a clinical x-ray and the government has stated that there are no significant health concerns from such levels. (NHK News)

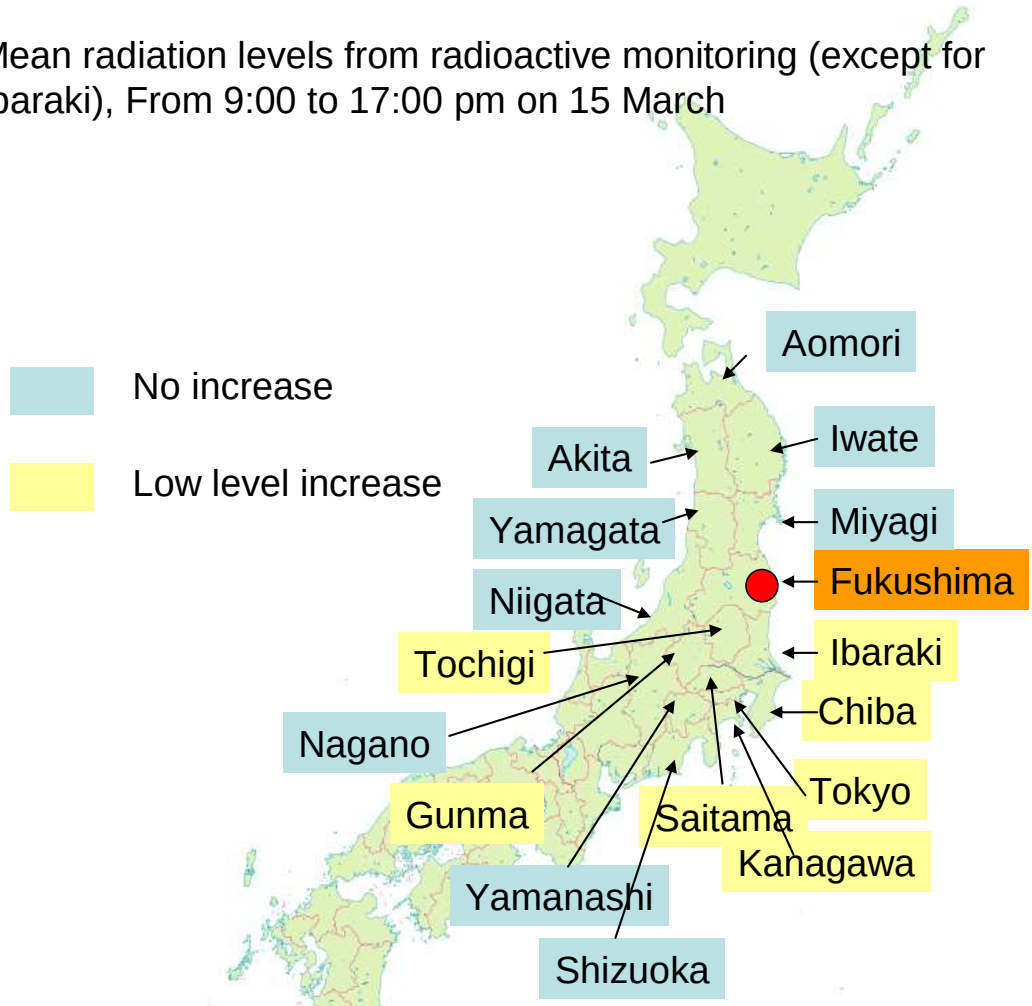
Map of Fukushima Daiichi Nuclear Power plant with reactors (No. 1 to 6 indicated by blue boxes). Monitoring of radiation levels are conducted at the main gate indicated as "Gate".



**Radiation levels (gamma rays) detected since 14 Mar at Main Gate, Daiichi plant – y axis measurements in micro Sv per hour**



Mean radiation levels from radioactive monitoring (except for Ibaraki), From 9:00 to 17:00 pm on 15 March




Ibaraki,Tokai (7pm) 1.80 microSv/h
Tokyo, Shinjuku 0.144 microSv/h
Tochigi, Utsunomiya 0.701 microSv/h
Gunma, Maebashi 0.191 microSv/h
Saitama, Saitama city (11 am) 0.328 microSv/h
Chiba, Ichihara city: 0.172 microSv/h
Kanagawa, Chigasaki 0.109 microSv/h

Source of map: Ministry of Education

## RESPONSE

### National response to earthquake and tsunami

The National Emergency Management Committee, led by the Prime Minister, has been established to oversee and coordinate all response activities. All relevant ministries and agencies such as Ministry of Foreign Affairs, Ministry of Land and Transportation and Ministry of Health have been involved in the response, as well as the Self Defence Force, Coast Guard, and Police.The Nuclear Disaster Response Committee has been activated. A state of emergency has been declared. All prefectures have also activated local government response.

Naval destroyers and other ships have been sent to the devastated areas of Honshu Island; air force fighter jets are currently flying reconnaissance missions. Army helicopters are involved in rescue missions in Miyagi, Fukushima, Iwate, including rescuing hundreds of people stranded at an elementary school in Watari, Miyagi prefecture. A total of 25 460 people have been rescued. Self Defence Force team arrived on the ground at Fukushima's Daiichi nuclear power plant site. MHLW has deployed staff to Sendai City Office and Tohoku Regional Office and MHLW are coordinating the logistics for medical supplies and equipment.

Several non-affected prefectures are preparing hotels and local government housing for evacuees.

Work is ongoing to secure routes to devastated areas as many roads were destroyed.

**Police and Fire Department** Police helicopters were deployed to Miyagi and Iwate for support. Deployment of response teams via helicopters and ships.

**Transportation:** Site assessments throughout the Tohoku and Kanto regions

**Coast Guard** Coordinating evacuation and alert services
Alerts to potential radiation exposure in Fukushima nuclear plant

**Ministry of Health Labour and Welfare (MHLW)**

Activities coordinated through DMAT (Disaster Medical Assistance Team)

- Deployed 57 teams
- Mobilizing 18 teams
- Standby 18 teams
- Have commenced deployment of vehicles for provision of water to affected areas. Designated hospital in Fukushima for responding to radiation exposure patients

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| **Ministry of Forests and Waters and Ministry of Finance** | Provision of rice, food and water<br>Deployment of 5 000 portable latrines<br>Provision of blankets, radios, gasoline, flashlights, dry ice and other essentials being prepared |
| **Requests** | National: Chiba Prefecture requested assistance from Self Defence Force |
| **Missing persons** | International: Internet system; Member State hotline services for their own nationals<br>National: hotline through Miyagi police |
| **Sewage** | Portable latrines being distributed (5 000 units) |
| **Water** | 250 000 bottles water being deployed; Utilizing beer tankers to transport potable water. |
| **Management of bodies** | MHLW supporting local government for disposal of corpses including dry ice collection and re-distribution for preservation of corpse prior to funeral |
| **Distribution sites:** | 5 in Miyagi, 11 in Fukushima, 1 in Iwate<br>Food - bread, rice, ramen<br>Other goods – blankets, gasoline, oil |

## National response to radiation/nuclear facility issues

- Japan Government asked IAEA to send expert (media).

## International response

- More than 39 countries/areas have offered support. Rescue teams coordinated by UNDAC team. Rescue teams from Australia, USA, Republic of Korea, Mexico, New Zealand, China, United Kingdom, France, Singapore Germany, Switzerland, Russia, Mongolia, and Italy have been deployed. The Japanese Foreign Minister has requested the US Ambassador to Japan to support relief efforts. US has deployed 140 rescue team members, with USAID disaster experts.
- Donations have also been made from China, Taiwan (China), India, Canada, and Mongolia.
- MSF is now on the ground assisting with affected areas.

- Japan Red Cross is offering mental and social care for numerous survivors.

## WHO-WPRO response

- WPRO has been in contact with the Ministry of Health, Labour and Welfare of Japan. The National IHR Focal Point in Japan has been designated by Japan to communicate with WHO on the event.
- WPRO has been communicating with its country offices, Headquarters and other relevant offices to monitor the situation and prepare for possible WHO support for response.
- Funds have been made available for initiating training and planning for mental health and psychosocial services.

# RISK COMMUNICATION

## WHO Actions

Following these concerns, the communications team conducted the following activities:

- Held a teleconference (15 March) with communications focal points in the country offices and WHO Representatives and Country Liaison Officers
- Produced background of a 'beginner's guide to nuclear incidents' and Questions and Answers for public release
- Media monitoring

## Specific issues that need to be addressed

- Self medication with iodide
- What the public should be doing
- Advise on what public health authorities may do for preparedness.

## CONTACTS FOR MORE INFORMATION


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