

guardian.co.uk

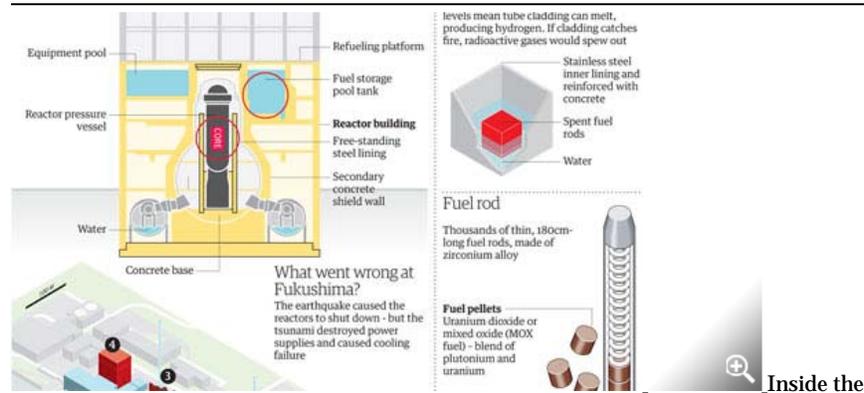
DATABLOG
 Facts are sacred

Tuesday update

Fukushima nuclear power plant update: get all the data

Japan is racing to gain control of the crisis at the Fukushima nuclear power plant. Where does the most detailed data come from? Updated daily

- [Get the data](#)



Fukushima nuclear plant by Friday 18th March. Click image for graphic

The 9.0 magnitude earthquake and following tsunami on March 11 has seen [Japan struggle as it battles to control the nuclear meltdown](#) of power plants in the north-east of the country.

It has also been announced that Japanese authorities have declared that [twice the safe level of radioactive iodine for young children, was found in Tokyo tap water](#). [Justin McCurry writes:](#)

"Authorities in Tokyo have warned that very young children in the Japanese capital should not drink tap water after it was found to contain twice the levels of radioactive iodine considered safe for infants.

The warning came as the spread of radioactivity continued through the food supply in the region surrounding the stricken Fukushima Daiichi [nuclear power plant](#)."

[Fukushima nuclear power plant in particular has been closely scrutinised](#) as reports flow in on the progress of the plant - [Japan's nuclear board raised the nuclear alert level from four to five](#) and [the JAIF warned last week of products such as dairy and spinach being restricted for shipping](#). Explosions and reports of nuclear fuel rods melting at the power plant have meant progress on the situation has been closely followed.

Industry body the [Japan Atomic Industrial Forum](#) are currently publishing daily updates of the status of power plants in Fukushima which give great detail into the condition of each reactor. Ranked from a level of low to severe, the update records the conditions of core and fuel integrity, water level and containment amongst other key information. These are some of the most in-depth and recent records and show how the crisis is being handled.

[Friday's report](#) detailed the dangers of radiation to workers, stating that two workers were hospitalised on March 24th 'because of the possible high exposure dose of their foot skin' - yesterday's report stated that the workers had been discharged from hospital. However the [dangers facing those working at the plant continues to be a subject of concern](#).

The table below shows the status of the reactors in the Fukushima Daiichi (the largest of the Fukushima power plants) and is colour coded to show the severity. Green for low, yellow represents high and red shows those of severe significance as judged by the [JAIF](#). We have used [JAIF's update 45 as of 16:00](#) local time as this is the most up to the minute data we can get.

A table of major incidents and accidents at the plants can be found in our spreadsheet as can the data for Daini, Onagawa and Tokai Daini Nuclear power stations. What can you do with this data?

Data summary

Fukushima nuclear power plant update - 29 March 2011

Click heading to sort - [Download this data](#)

Unit	1	2	3	4	5	6
Electric / Thermal Power output (MW)	460 / 1380	784 / 2381	784 / 2381	784 / 2381	784 / 2381	1100 / 3293
Type of Reactor	BWR-3	BWR-4	BWR-4	BWR-4	BWR-4	BWR-5
Operation Status at the earthquake occurred	In Service -> Shut - down	In Service -> Shut - down	In Service -> Shut - down	Out - age	Out - age	Out - age
Core and Fuel Integrity	Dama - ged (400)	Dama - ged (548)	Dama - ged (548)	No fuel rods	Not Dama - ged (548)	Not Dama - ged (764)
Reactor Pressure Vessel Integrity	Un- known	Un- known	Un- known	Not Dama - ged	Not Dama - ged	Not Dama - ged

SOURCE: JAIF

Radiation level: 116.6µSv/h at the West gate at 07:50, Mar. 29

Evacuation: 20km from NPS (Mar. 12) * People who live between 20km to 30km from the Fukushima Dai-ichi NPS shall stay in the houses or buildings (Mar. 15), should consider leaving (Mar. 25).

Environmental effect: Radioactive material was detected from milk and agricultural products from Fukushima and neighboring prefectures. The government issues order to limit shipment and intake for some products from some areas.

Radioactive iodine was detected from tap water sampled at some prefecture. Level of iodine in tap water temporarily exceeded the provisional legal limit for infant consumption.

Radioactive iodine, Cesium, Ruthenium, and Tellurium were detected from seawater sample collected in the sea surrounding the power station.

Nuclear Safety Commission of Japan released prediction of radioactive material spread caused by the accident. This prediction was based on the calculation using computer code called

SPEEDI (System for Prediction of Environmental Emergency Dose Information).=>

http://www.nsc.go.jp/info/110323_top_siryo.pdf

Radiation dose higher than 1000 mSv was measured at the surface of water accumulated in the tunnel for laying piping outside Unit 2 turbine building on Mar. 28th.

Plutonium was detected from the soil of the Fukushima Dai-ichi NPS site on Mar. 28th. The concentration of plutonium measured is as little as in normal environment, almost the same

as measured in Japan when the nuclear bomb tests were conducted in the atmosphere in the past, and not harmful to human body.

Unit	1	2	3	4	5	6
Containment Vessel Integrity	Not Damaged	Damage and leak Suspected	Not Damaged	Not Damaged	Not Damaged	Not Damaged
Core cooling requiring AC power 1	Not Functional	Not Functional	Not Functional	N/A	Functional	Functional
Core cooling requiring AC power 2	Not Functional	Not Functional	Not Functional	N/A	Functioning (in cold shutdown)	Functioning (in cold shutdown)
Building Integrity	Severely Damaged	Slightly Damaged	Severely Damaged	Severely Damaged	Open a vent hole - to avoid hydro - gen explosion	Open a vent hole - to avoid hydro - gen explosion
Water Level of the Reactor Pressure Vessel	Fuel exposed	Fuel exposed	Fuel exposed	Safe	Safe	Safe
Pressure of the Reactor Pressure Vessel	Slightly Decreasing	Unknown	Unknown	Safe	Safe	Safe
Containment Vessel Pressure	No significant change	Stable	Stable	Safe	Safe	Safe
Water injection to core	Cont. (Fresh - water)	Cont. (Fresh - water)	Cont. (Fresh - water)	N/A	N/A	N/A
Water injection to Containment Vessel (AM)	TBC	TBC (Sea water)	TBC	N/A	N/A	N/A
Containment venting (AM)	Temp stopped	Temp stopped	Temp stopped	N/A	N/A	N/A
Fuel Integrity in the spent fuel pool	Unknown (292)	Unknown (587)	Damage suspected (514)	Possibly Damaged (1331)	Not Damaged (946)	Not Damaged (876)
Cooling of the spent fuel pool	Water injection to be considered	Sea water injection continue	Sea water spray continue	Sea water spray continue. Hydrogen from the pool exploded	Pool cooling capability was recovered	Pool cooling capability was recovered

SOURCE: JAIF

Radiation level: 116.6µSv/h at the West gate at 07:50, Mar. 29

Evacuation: 20km from NPS (Mar. 12) * People who live between 20km to 30km from the Fukushima Dai-ichi NPS shall stay in the houses or buildings (Mar. 15), should consider leaving (Mar. 25).

Environmental effect: Radioactive material was detected from milk and agricultural products from Fukushima and neighboring prefectures. The government issues order to limit shipment and intake for some products from some areas.

Radioactive iodine was detected from tap water sampled at some prefecture. Level of iodine in tap water temporarily exceeded the provisional legal limit for infant consumption.

Radioactive iodine, Cesium, Ruthenium, and Tellurium were detected from seawater sample collected in the sea surrounding the power station.

Nuclear Safety Commission of Japan released prediction of radioactive material spread caused by the accident. This prediction was based on the calculation using computer code called SPEEDI (System for Prediction of Environmental Emergency Dose Information). =>

http://www.nsc.go.jp/info/110323_top_siryō.pdf

Radiation dose higher than 1000 mSv was measured at the surface of water accumulated in the tunnel for laying piping outside Unit 2 turbine building on Mar. 28th.

Plutonium was detected from the soil of the Fukushima Dai-ichi NPS site on Mar. 28th. The concentration of plutonium measured is as little as in normal environment, almost the same

as measured in Japan when the nuclear bomb tests were conducted in the atmosphere in the past, and not harmful to human body.

Unit	1	2	3	4	5	6
Main Control Room Habitability & Operability	Poor due to loss of AC power (Lighting work - ing in unit 1 & 2)	Poor due to loss of AC power (Lighting work - ing in unit 1 & 2)	Poor due to loss of AC power (Lighting work - ing in unit 3 & 4)	Poor due to loss of AC power (Lighting work - ing in unit 3 & 4)	Not dam - aged (estimate)	Not dam - aged (estimate)
INES LEVEL (est by NISA)	5	5	5	3	-	-

SOURCE: JAIF

Radiation level:116.6µSv/h at the West gate at 07:50, Mar. 29

Evacuation:20km from NPS(Mar. 12) * People who live between 20km to 30km from the Fukushima Dai-ichi NPS shall stay in the houses or buildings Mar. 15), should consider leaving Mar. 25).

Environmental effect: Radioactive material was detected from milk and agricultural products from Fukushima and neighboring prefectures. The government issue order to limit shipment and intake for some products from some areas.

Radioactive iodine was detected from tap water sampled at some prefecture. Level of iodine in tap water temporarily exceed the provisional legal limit for infant consumption.

Radioactive iodine, Cesium, Ruthenium, and Tellurium were detected from seawater sample collected in the sea surrounding the power station.

Nuclear Safety Commission of Japan released prediction of radioactive material spread caused by the accident. This prediction was based on the calculation using computer code called

SPEEDI (System for Prediction of Environmental Emergency Dose Information).=>

http://www.nsc.go.jp/info/110323_top_siryu.pdf

Radiation dose higher than 1000 mSv was measured at the surface of water accumulated in the tunnel for laying piping outside Unit 2 turbine building on Mar. 28th.

Plutonium was detected from the soil of the Fukushima Dai-ichi NPS site on Mar. 28th. The concentration of plutonium measured is as little as in normal environment, almost the same

as measured in Japan when the nuclear bomb tests were conducted in the atmosphere in the past, and not harmful to human body.

Download the data

- [DATA: download the full spreadsheet](#)

More data

[Data journalism and data visualisations from the Guardian](#)

World government data

- [Search the world's government data with our gateway](#)

Development and aid data

- [Search the world's global development data with our gateway](#)

Can you do something with this data?

- **Flickr** Please post your visualisations and mash-ups on our [Flickr group](#)
- Contact us at data@guardian.co.uk
- **Get the A-Z of data**
- **More at the Datastore directory**
- **Follow us on Twitter**
- **Like us on Facebook**

[Next](#)

[Previous](#)

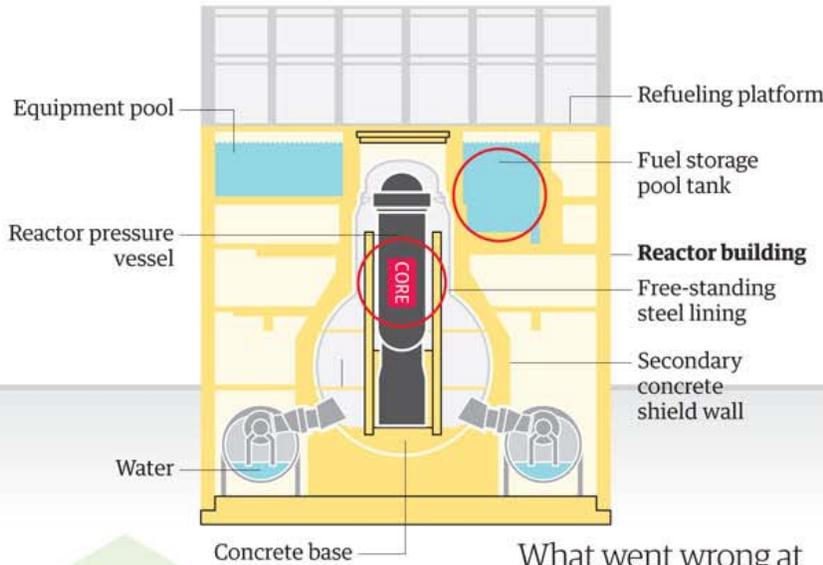
[Blog home](#)

guardian.co.uk © Guardian News and Media Limited 2011

Fukushima Battle to prevent a complete meltdown

Inside the reactors

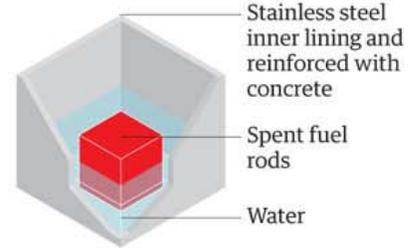
There are two main areas of concern inside each of the six reactors - the fuel rods in the core reactor and old rods overheating in storage tanks



Why do the fuel storage pools matter?

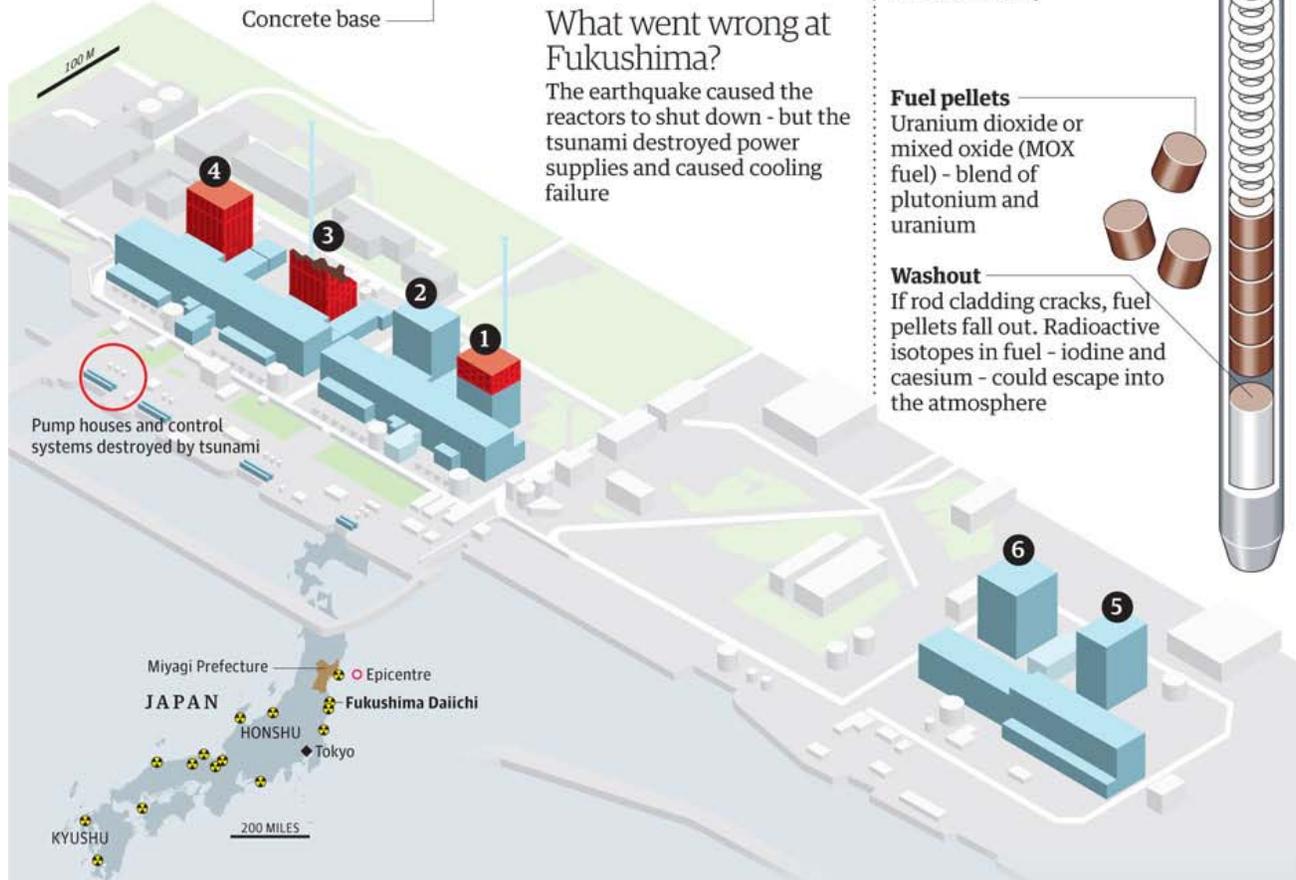
Reactors 3 and 4 at highest risk

Old fuel rods stored in water. Low water levels mean tube cladding can melt, producing hydrogen. If cladding catches fire, radioactive gases would spew out



What went wrong at Fukushima?

The earthquake caused the reactors to shut down - but the tsunami destroyed power supplies and caused cooling failure



Fuel rod

Thousands of thin, 180cm-long fuel rods, made of zirconium alloy

Fuel pellets

Uranium dioxide or mixed oxide (MOX fuel) - blend of plutonium and uranium

Washout

If rod cladding cracks, fuel pellets fall out. Radioactive isotopes in fuel - iodine and caesium - could escape into the atmosphere



Reactor 1

Hydrogen explosion ripped outer building apart on Saturday. 70% of fuel rods in reactor now damaged

Core/fuel integrity:

Reactor 2

Cooling water falling as emergency systems fail, exposing all of the fuel rods before water was successfully pumped back into the reactor

Core/fuel integrity:

Reactor 3

MOX-fueled reactor, exploded Sunday injuring 11. Seawater dropped from helicopters to cool fuel storage tank

Core/fuel integrity:

Reactor 4

Off-line when quake and tsunami struck. Spent fuel pool caught fire Tuesday, releasing radiation. 8sqm holes in containment building

Core/fuel integrity:

Reactor 5

Reactor off-line at time of earthquake. Concern over spent fuel pool temperature - water level dropped 40cm in five hours Wednesday

Core/fuel integrity:

Reactor 6

Reactor off-line at time of earthquake. Concern over spent fuel pool temperature, after water being diverted to reactor 5 tank

Core/fuel integrity:

Damaged	Damaged	Damaged	No fuel in reactor	No fuel in reactor	No fuel in reactor
Containment: Not damaged	Containment: Damaged	Containment: Damaged	Containment: Not damaged	Containment: Not damaged	Containment: Not damaged
Outer building: Severely damaged	Outer building: Slight damage	Outer building: Severely damaged	Outer building: Severely damaged	Outer building: Not damaged	Outer building: Not damaged
Water level in reactor: Half fuel exposed	Water level in reactor: Half fuel exposed	Water level in reactor: Half fuel exposed	Water level in reactor: Safe	Water level in reactor: Safe - dropping	Water level in reactor: Safe
Spent fuel pool: unknown	Spent fuel pool: Level decreasing	Spent fuel pool: Level low	Spent fuel pool: Level low	Spent fuel pool: Temp increasing	Spent fuel pool: Temp increasing
Fuel in SFP: 50 tonnes	Fuel in SFP: 81tn	Fuel in SFP: 88tn	Fuel in SFP: 135tn	Fuel in SFP: 142tn	Fuel in SPW: 151tn

Inside the Fukushima nuclear plant by Friday 18th March. Graphic: Mark McCormick and Jenny Ridley