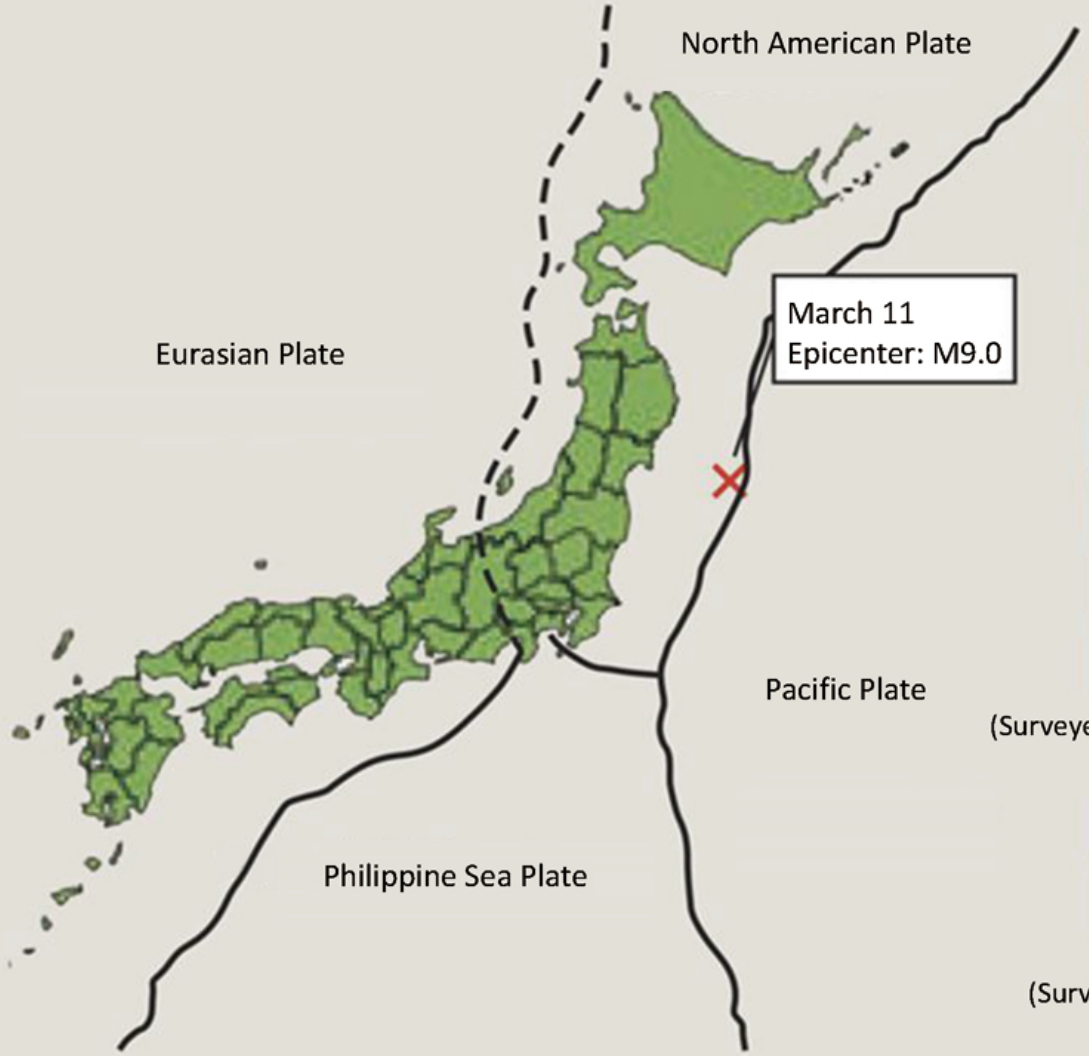
Fukushima Daiichi Nuclear Power Station (NPS) Accident

# Damage due to the Great East Japan Earthquake

- A 9.0-magnitude earthquake occurred off the coast of Sanriku at 14:46 p.m. on Friday, March 11, 2011. The Earthquake and subsequent tsunami caused severe damage mainly to the Tohoku region.
- The earthquake was the largest ever recorded in Japan and the fourth biggest in the world since 1900.




| Human damage | |
|---|---|
| Dead | 15,899 |
| Missing | 2,527 |
| Injured | 6,157 |

| Damage to buildings | |
|---|---|
| Completely destroyed | 121,992 |
| Half destroyed | 282,920 |
| Partially destroyed | 730,392 |

(Surveyed by the National Police Agency; as of December 10, 2020)

| Disaster victim support | |
|---|---|
| Evacuees nationwide | 41,781 |

(Surveyed by the Reconstruction Agency; as of January 29, 2021)

Fukushima Daiichi Nuclear Power Station (NPS) Accident

# Accident at the Nuclear Power Station

**Tokyo Electric Power Company (TEPCO)'s Fukushima Daiichi NPS Unit 3 (shot from the air)**

(Shot on March 16, 2011; Provided by TEPCO)

Fukushima Daiichi Nuclear Power Station (NPS) Accident

# Factors of the Accident: (Estimated) Influence of the Earthquake and Tsunami

**Earthquake**

14:46 p.m. on March 11

- Collapse of transmission line towers
- Failure of breakers, etc.
- Automatic shut-down of reactors

Loss of external power supply

The emergency power system was activated immediately.

Functions to cool down reactors and spent fuel pools were maintained.

**Tsunami**

First tsunami: 15:27 p.m.
Second tsunami: 15:35 p.m.

- Failure of emergency power generators
- Failure of cooling seawater pumps and switchboards, etc.

Loss of all AC power

Loss of the reactor cooling function and coolant injection function

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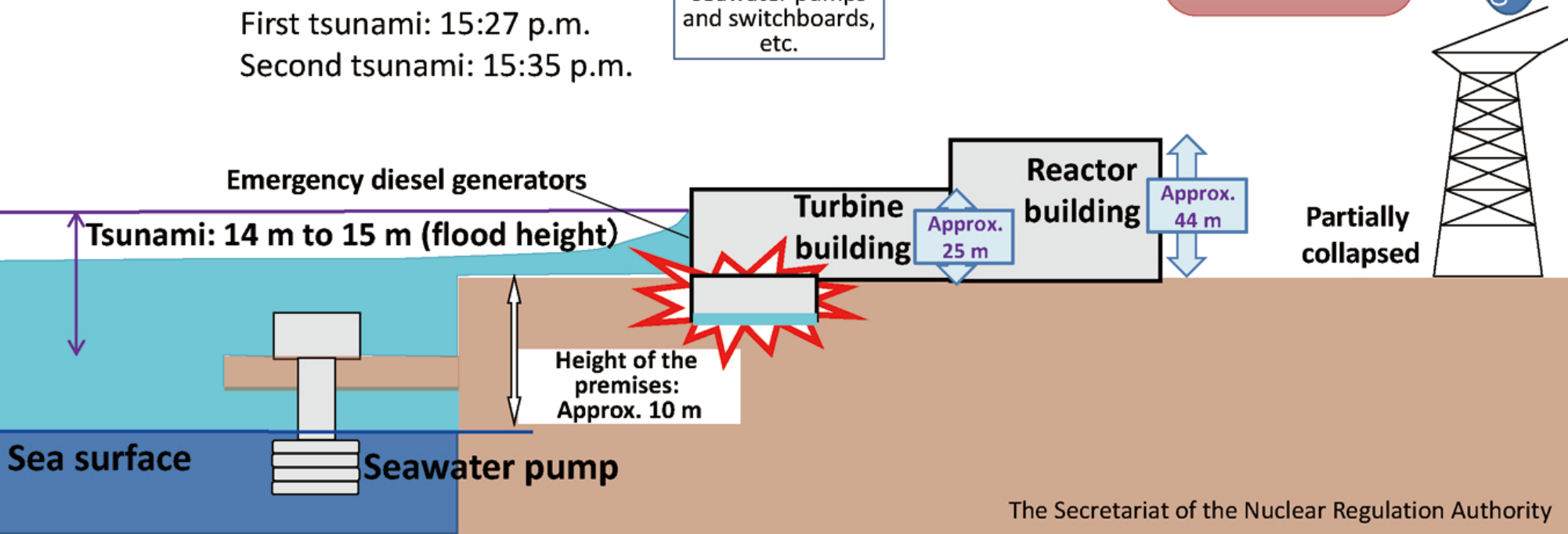


Fukushima Daiichi Nuclear Power Station (NPS) Accident

# Factors of the Accident: (Estimated) Status within the Reactor

Continued from the previous page

Loss of functions to cool down reactors and inject coolant

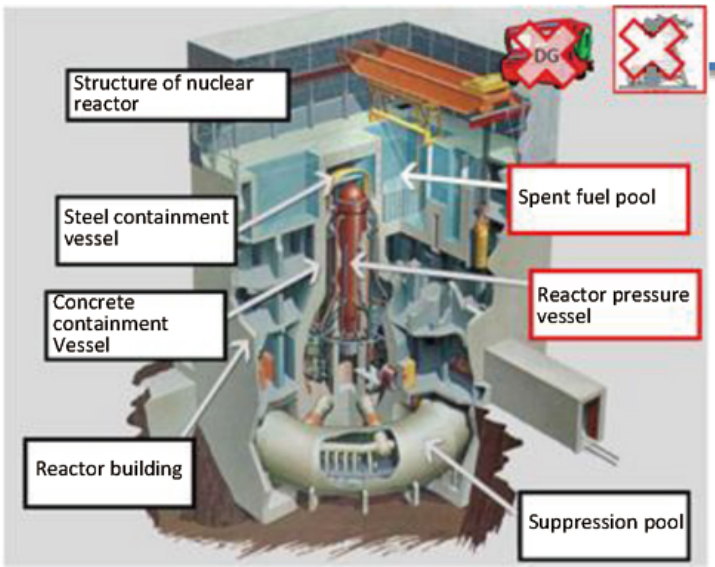
**Increase in reactor pressure** due to steam

Pressure reduction by opening valves

Failed to take these measures on a timely basis

**Temperature increase** due to fuel heating without coolant

Alternative coolant injection using firefighting pumps, etc.




## Events that occurred

- **Generation of hydrogen due to water-zirconium reaction**
  →Hydrogen explosion
- **Overheat of core fuel**
  →Core melt
- **Deterioration of air tightness at the pressure vessel penetrator**
  →Part of the melted fuel flowed down from the pressure vessel to the containment vessel.
- **Deterioration of the containment vessel**
  →Outflow of high-level radioactive-contaminated water
  →Discharge of radioactive materials into the air

## Almost avoided

- **Steam explosion**
- **Recriticality**
- **Fuel damage due to evaporation of coolant in the spent fuel pool**