



February 26 – March 1, 2012 ♦ Phoenix, Arizona

## **Worldwide Perspective on the Fukushima Dai-ichi Accident**

**Ute Blohm-Hieber, EU**

**Lisa Edwards, EPRI**

**Irena Mele, IAEA**

**Charles Miller, NRC**

**Kazuhiro Suzuki, METI**

**Co-chairs: John Mathieson, NDA & Larry Camper, NRC**

# Session overview

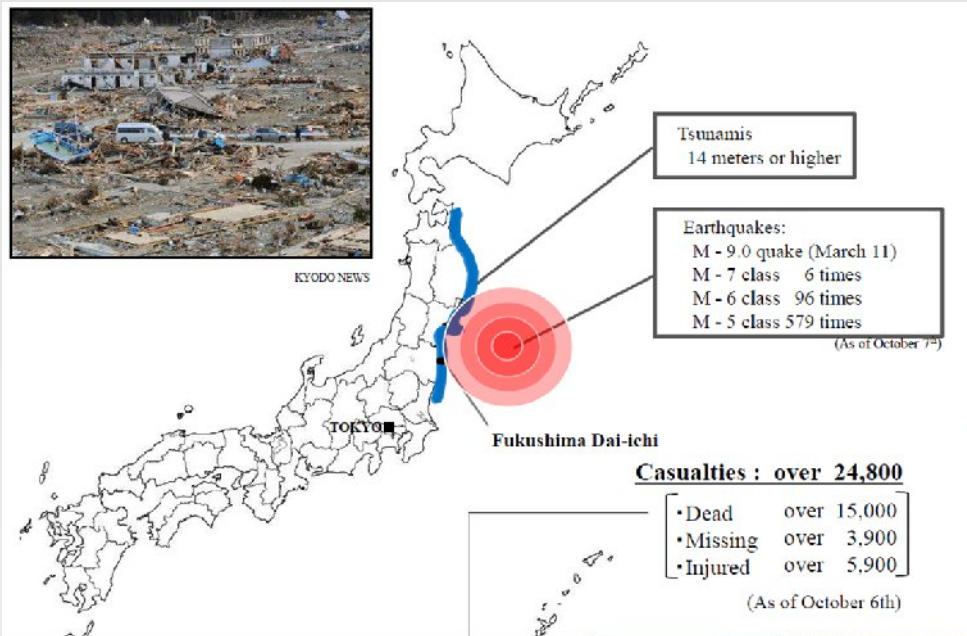
- Introductions
- Panellist's presentations
  - **Kazuhiro Suzuki, METI**
  - **Lisa Edwards, EPRI**
  - **Charles Miller, NRC**
  - **Ute Blohm-Hieber, EU**
  - **Irena Mele, IAEA**
- Discussion

This afternoon in 102:

- **SESSION 012: Featured Country - Japan: Fukushima - Emerging Issues - Part 2 of 3**
  - Co Chair(s): Jas Devgun, Sargent & Lundy, LLC (USA); William Murphie, US DOE (USA)
- **SESSION 013: Fukushima Clean Up: Insight into Operations - Part 3 of 3**
  - Co Chair(s): Lisa Edwards, EPRI (USA); David Oren, CH2M HILL, Inc. (USA)



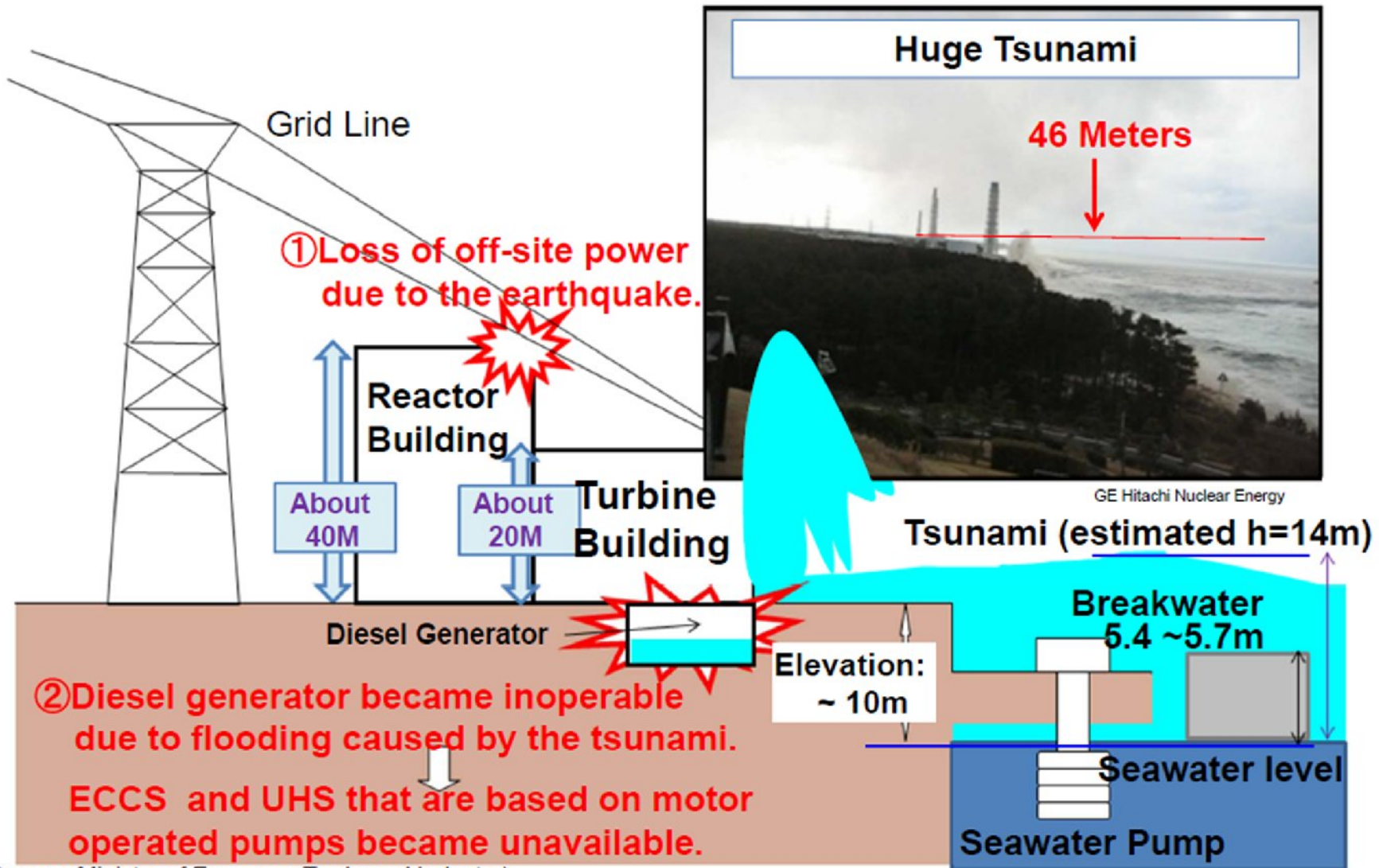
# The Great East Japan Earthquake



		automatic shut down	cold shut down
<b>Onagawa</b>			
Unit 1	524 MW, 1984-	✓	✓
Unit 2	825 MW, 1995-	✓	✓
Unit 3	825 MW, 2002-	✓	✓
<b>Fukushima Dai-ichi</b>			
Unit 1	460 MW, 1971-	✓	
Unit 2	784 MW, 1974-	✓	
Unit 3	784 MW, 1976-	✓	
Unit 4	784 MW, 1978-	Periodical inspection	
Unit 5	784 MW, 1978-		✓
Unit 6	1,100 MW, 1979-		✓
<b>Fukushima Dai-ni</b>			
Unit 1	1,100 MW, 1982-	✓	✓
Unit 2	1,100 MW, 1984-	✓	✓
Unit 3	1,100 MW, 1985-	✓	✓
Unit 4	1,100 MW, 1987-	✓	✓
<b>Tokai Dai-ni</b>			
Unit 1	1,100 MW, 1978-	✓	✓

Source METI

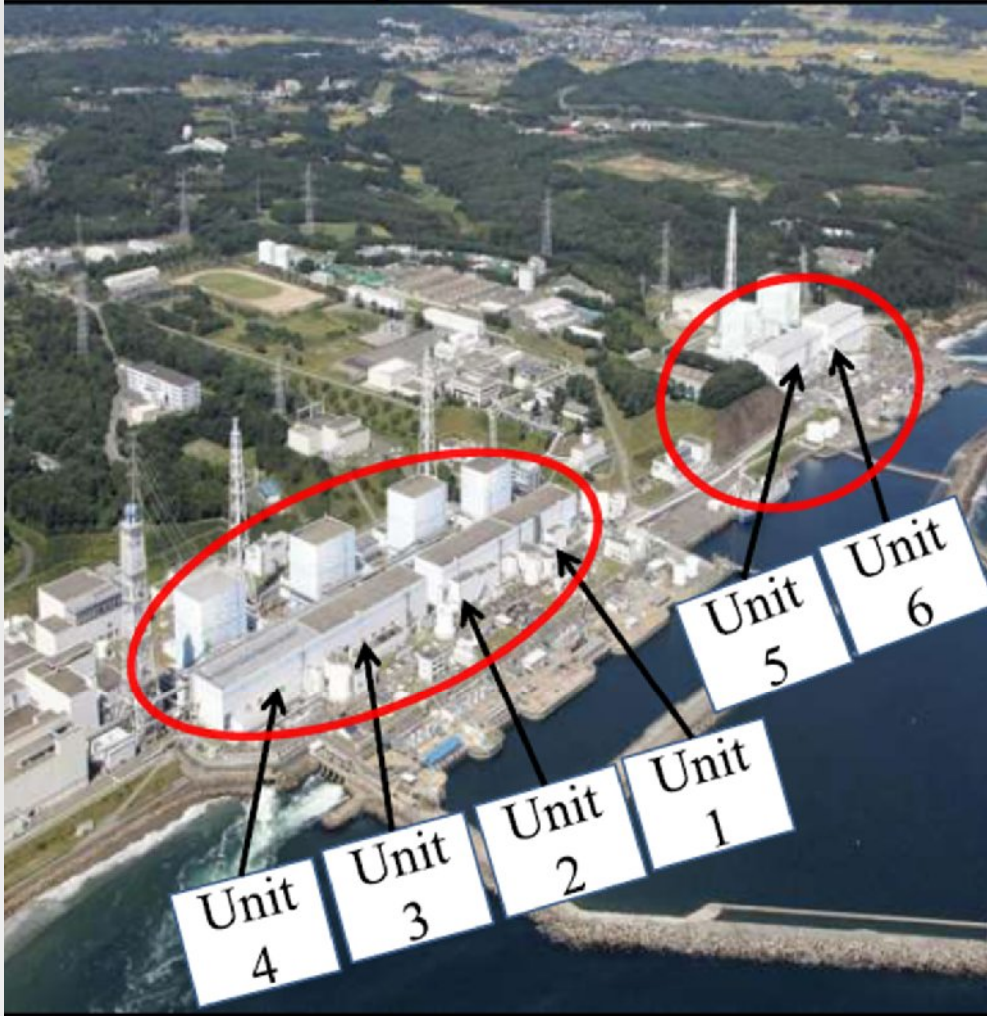
# Damage of Fukushima Daiichi NPP due to Earthquake and Tsunami



(Source: Ministry of Economy, Trade and Industry)

# The Tsunami (1)

Before the Earthquake and Tsunamis



TEPCO

After the Earthquake and Tsunamis



Air Photo Service Inc (Myoko, Niigata Japan)

# The Tsunami (2)

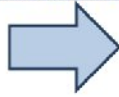
March 13



Sendai airport

KYODO NEWS

1 month later



April 13



Sendai airport

KYODO NEWS

**Railroad**



1 week later



Sendai Station

**Port**



1 month later



Sendai-Shiogama Port

**Road**



3 weeks later



Miyagi prefectural road, Route 240  
East Japan Railway, Miyagi Prefectural Government

33

March 17



6 Days Later

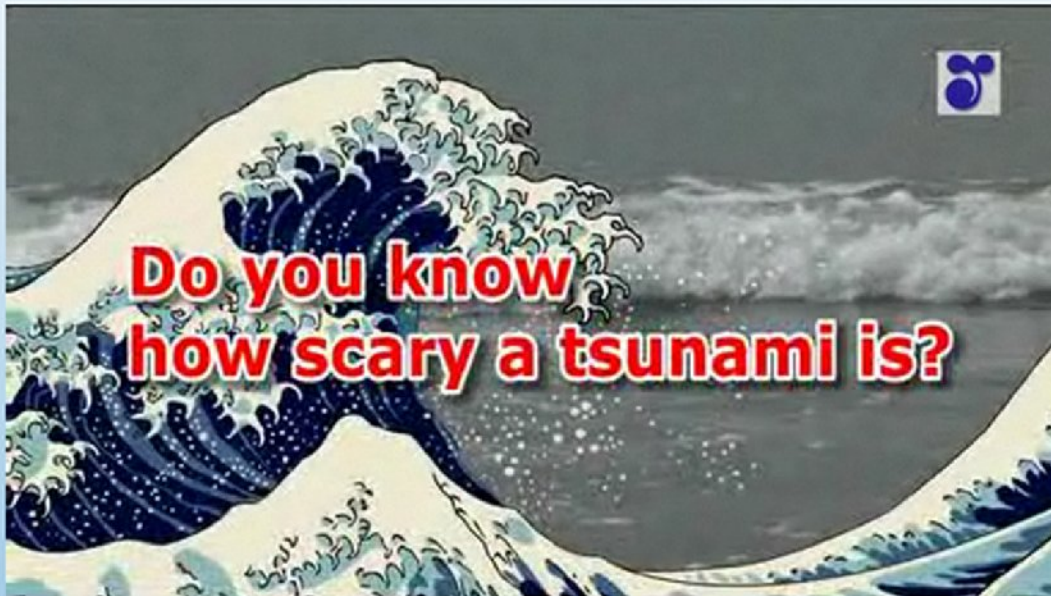
Great Kanto  
Highway in Naka

## Topics

Topics

2011/03/10 ★★★★★

Do you know how scary a tsunami is?



Japanese Governments Internet TV 




00:01:18 / 00:12:03



If you know all about tsunamis and how to protect yourself from them, tsunami disasters can be reduced. This program will show you how scary tsunamis can be and introduce ways to protect yourself.

# March 10 2011

Earthquakes with people reported dead or missing as a result of the tsunami that followed 

Year	Name of Earthquake	No. of dead or missing
1896	The Meiji-Sanriku Earthquake	c.22,000
1923	The Great Kanto Earthquake	c.105,000
1933	The Showa-Sanriku Earthquake	3,064
1944	The Tonankai Earthquake	1,223
1946	The Nankai Earthquake	1,330
1952	The Tokachi Offshore Earthquake	33
1960	The Great Chile Earthquake	142
1983	The Center of Sea of Japan Earthquake in 1983	104
1993	The Southwest off Hokkaido Earthquake in 1993	230
2003	The Tokachi-oki Earthquake in 2003	2

Based on chronological scientific tables: the number of dead and missing includes those caused by the quake, etc.  
Source: the Japan Meteorological Agency

## Tsunami Warning/Tsunami Advisory

### Category of tsunami forecast

**Tsunami Warning (Major tsunami)**

The tsunami height is expected to be 3 meters or more.

**Tsunami Warning (Tsunami)**

The tsunami height is expected to be up to 2 meters.

**Tsunami Advisory**

The tsunami height is expected to be about 0.5 meters.

The country is divided into 66 individual forecast regions.

# Japan events

- 11 March 2011 – onwards
  - Accident – leading to consequences onsite and offsite,
  - subsequent explosions,
  - liquid and gaseous releases
  - evacuation of 80,000 people
  - control of foodstuffs
  - clean-up activities on and offsite
- 16 December “cold shutdown” achieved



# Worldwide response

- Support for Japan and for the site from many countries and international organisations
  - 163 countries & regions
  - 43 international organisations
  - Rescue teams from 27 entities
- Reactor Safety reviews “stress tests”
- Leadership role from the IAEA
  - fact-finding mission to Japan
  - centralised information source
  - subsequent adoption of an Action Plan



# Nuclear reaction

- Phase-out
  - Germany closed down 8 reactors & re-introduced phase-out policy - 2022;
  - Switzerland - phase-out by 2034;
  - Belgium, Spain and Sweden and others;
- “Pausing”
  - Japan, Mexico, Some EU
- Continuing construction
  - Korea, US, UK, France(?), China ... several others;
- Newcomer countries
  - UAE, Turkey, Poland, Jordan, Bangladesh, ... several others going forward;
  - Venezuela, Greece, Thailand, Philippines

# Fukushima Prefecture



福島県知事 佐藤雄平

Yuhei Sato  
Governor, Fukushima Prefecture

*'The vision for revitalization of Fukushima Prefecture' .... I will go forward with residents and municipalities hand in hand to revive 'FUKUSHIMA', which is widely known to the world due to the nuclear accident, to "A new Fukushima" in which we can take pride to the world.*

