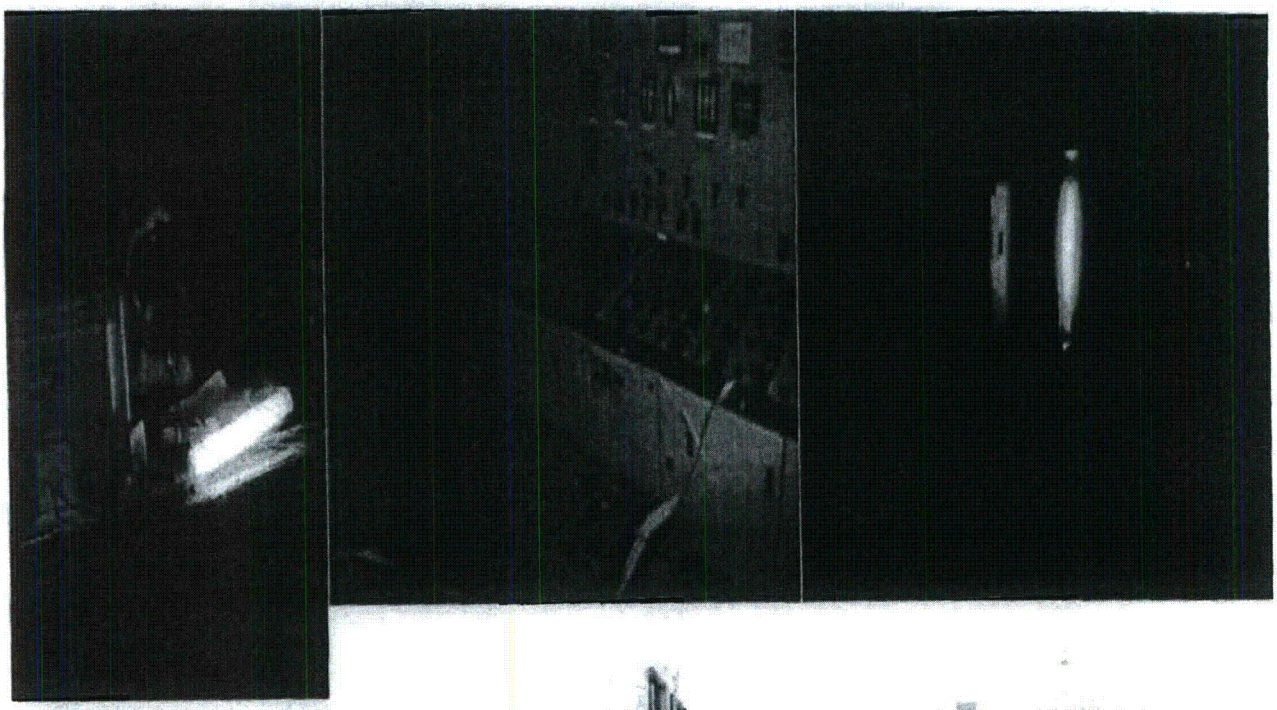
Photographs from One of the Fukushima 50



Source: TEPCO

Summary : Differences of Units 1-4, Fukushima Dai-ichi

- *Fukushima Daiichi Units 5 & 6*
  - Elevation of the ground is 13 m. (Units 1 - 4 : 10m)
  - One air cooled EDG of Unit 6 which is located on the ground level was survived.
  - Metal Clad Switchgears were not lost.
  - Temporary sea water pump installed after the earthquake was operable, making use of power from survived EDG.
- *Fukushima Daini NPPs*
  - External power was not lost.
  - RHR function of Unit 3 was survived.
  - Motors of sea water pumps for Unit 1,2 and 4 were replaced by March 14, followed by re-activation of core cooling function.
- *Onagawa NPPs*
  - Elevation of the plants was 14.8m which is higher than Tsunami height.
- *Tokai-2*
  - Although off-site power was lost until May 13, 2 out of 3 EDGs were not lost thanks to the recently installed barrage to one of 2 seawater pump area to protect pumps from tsunami.

Radioactive Materials and Decay Power in Units 1, 2 and 3

Source Term just after the Shutdown

Unit 1 Fuel

I-131 : 1.9×10^{18} Bq

Cs-137 : 2.0×10^{17} Bq

Unit 2

I-131 : 2.7×10^{18} Bq

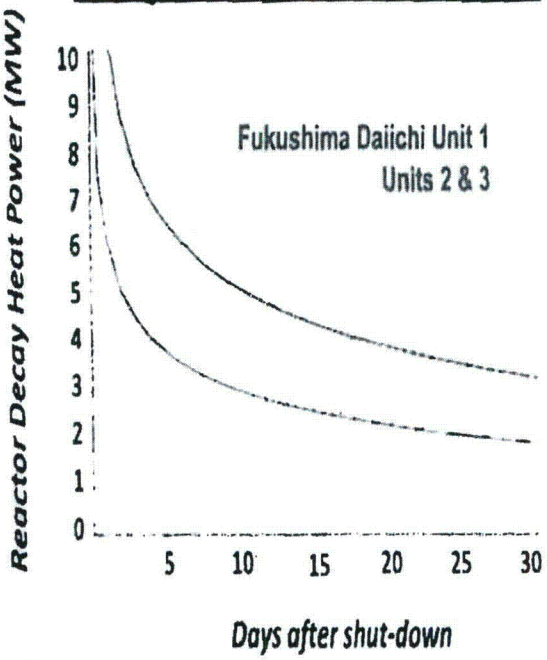
Cs-137 : 2.4×10^{17} Bq

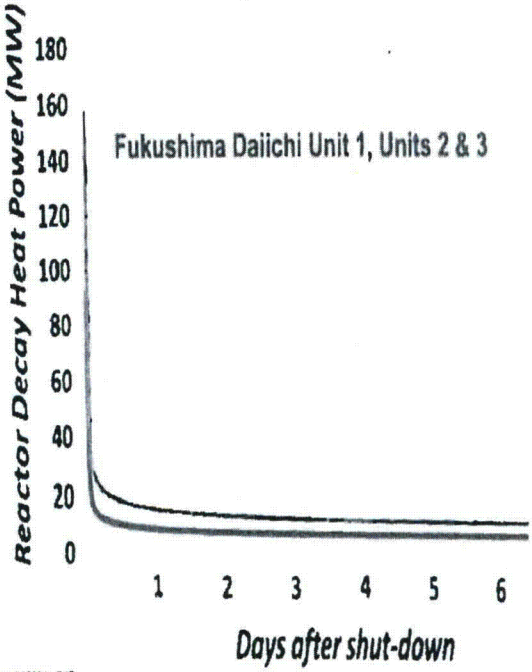
Unit 3

I-131 : 2.7×10^{18} Bq

Cs-137 : 2.4×10^{17} Bq

Decay Heat after the Shutdown



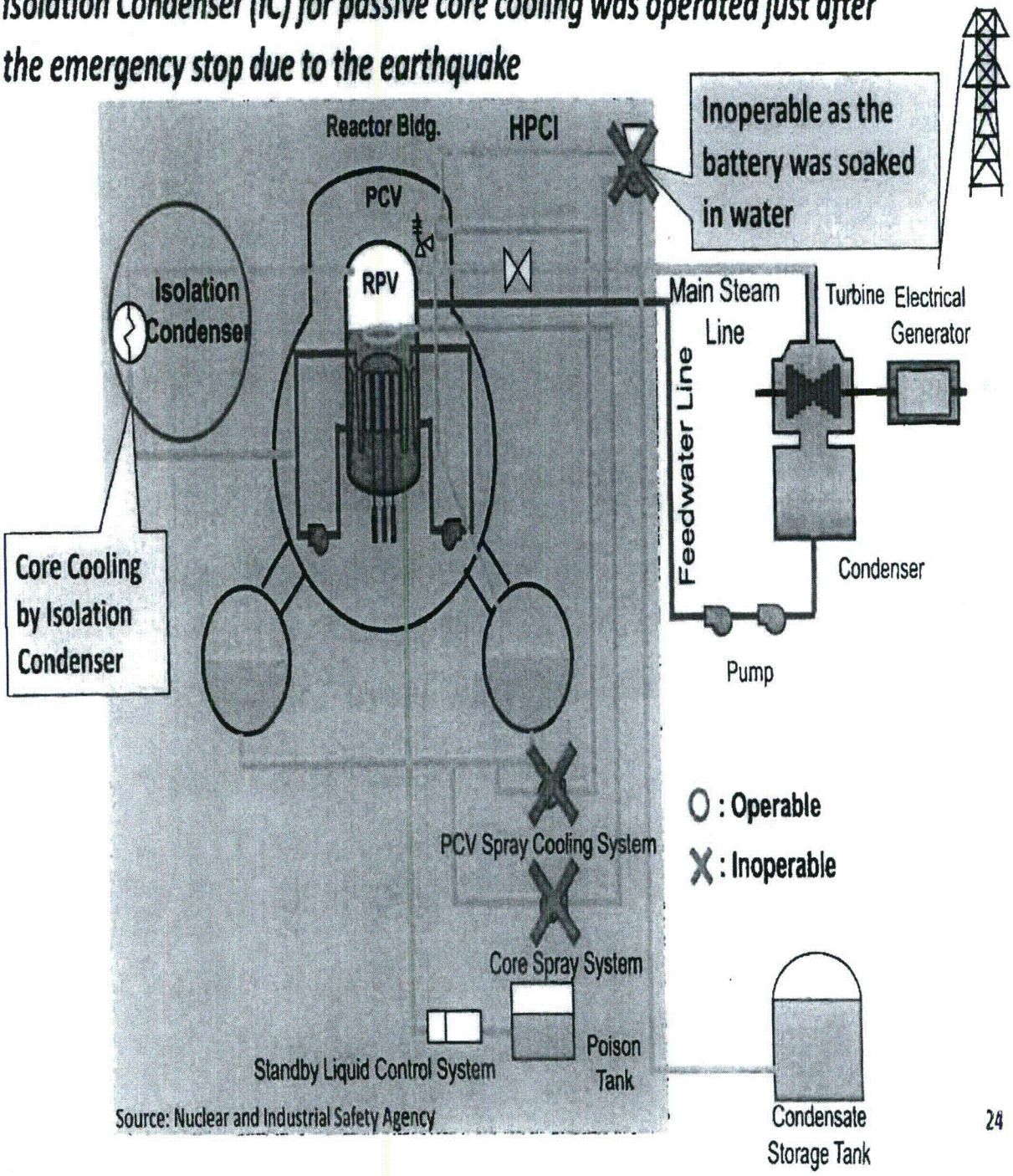


Short-term Actions for Termination of Accident and Emergency

- **Stable Cooling to Cold Shut-down**
  - Flooding (?) the containment to a certain level & installation of heat exchanger to remove heat
  - SFP cooling system
- **Minimize Airborne and Liquid Effluent**
  - Recycling of water, storage of contaminated water, ...
  - Cover for reactor building, site soil, ground water, ...
- **Dose and Contamination Maps**

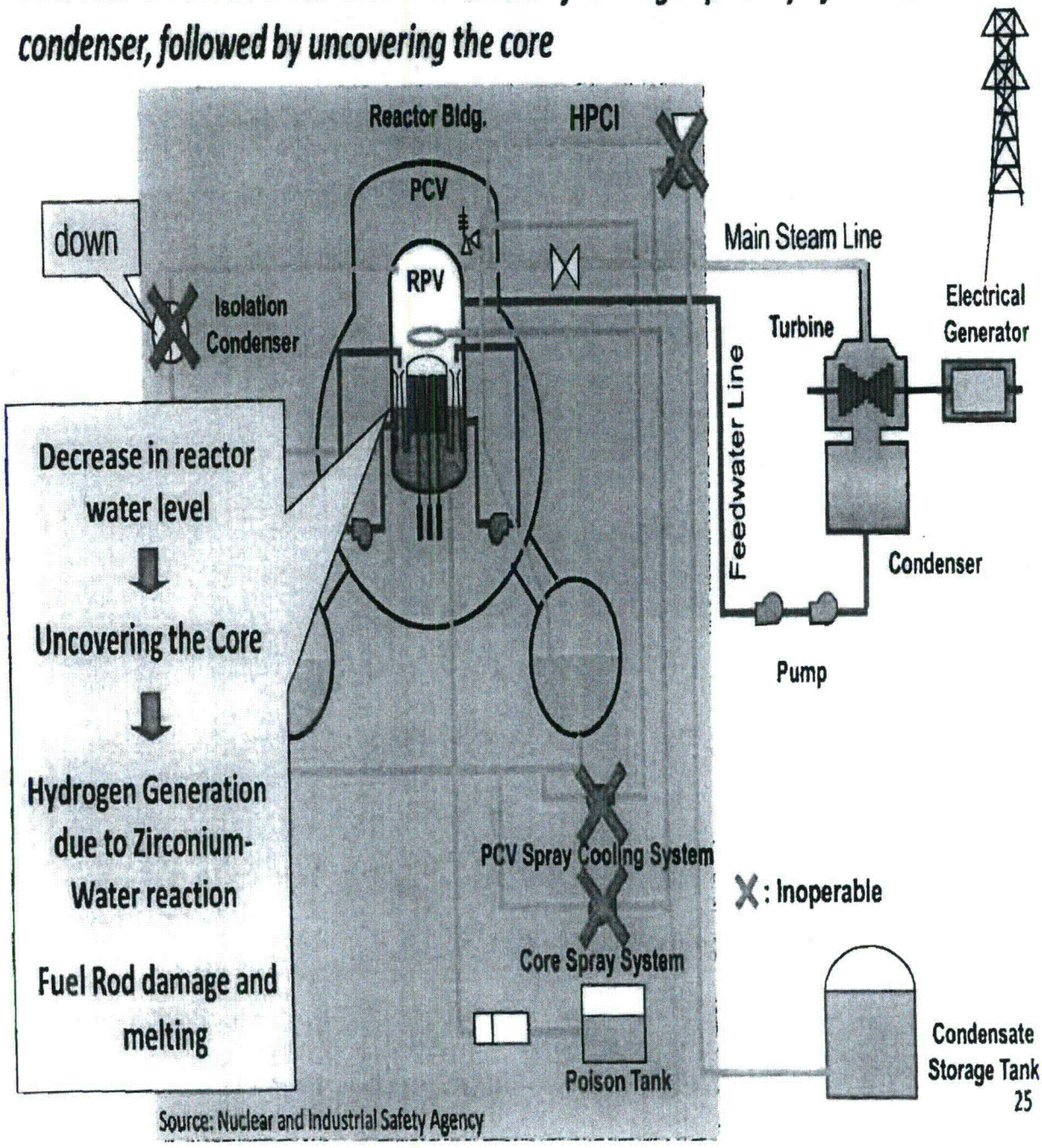
Unit 1 : Cooling by Isolation Condenser

Isolation Condenser (IC) for passive core cooling was operated just after the emergency stop due to the earthquake



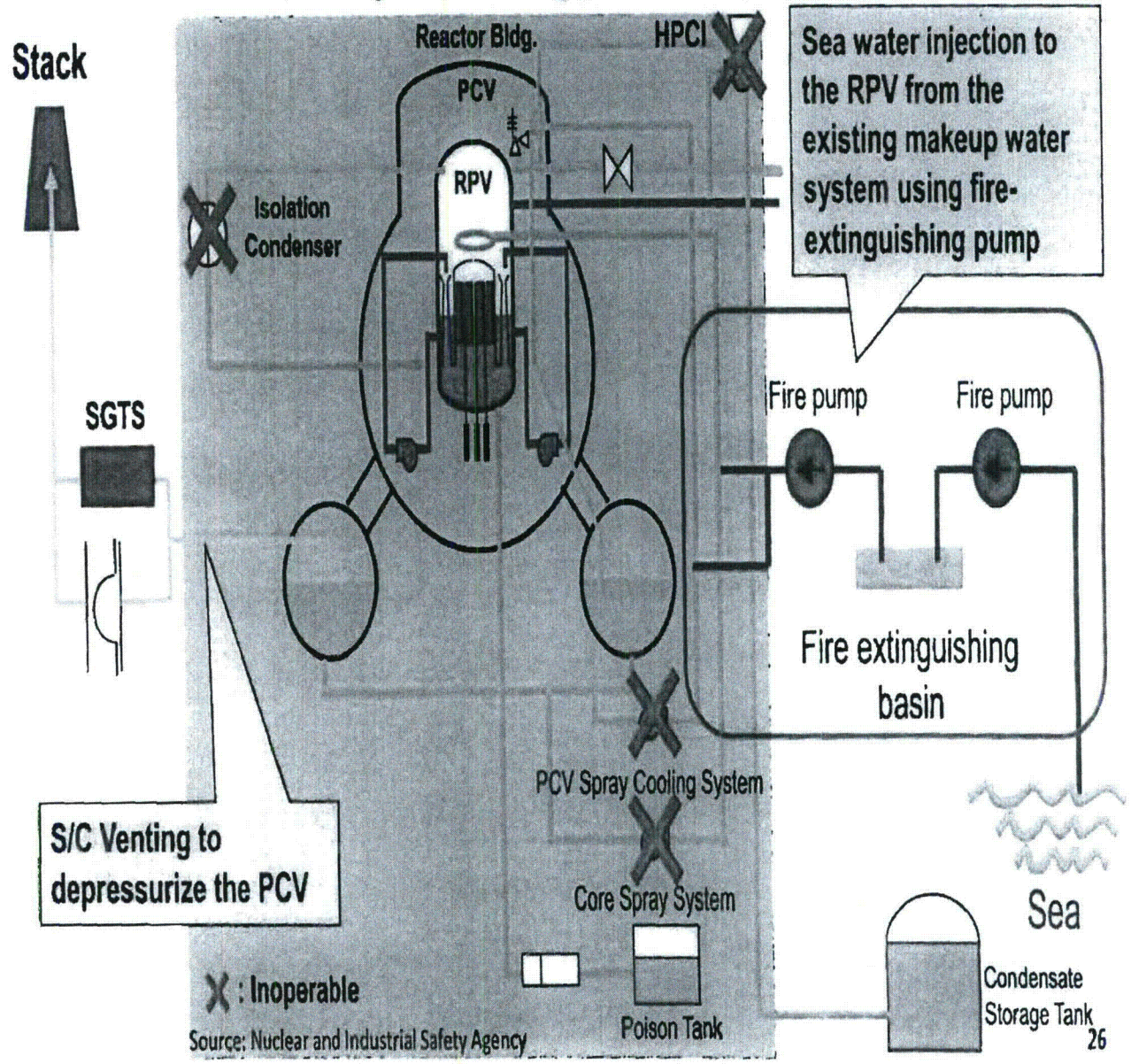
Unit 1 : Loss of Cooling

Decrease in reactor water level due to loss of cooling capability of Isolation condenser, followed by uncovering the core

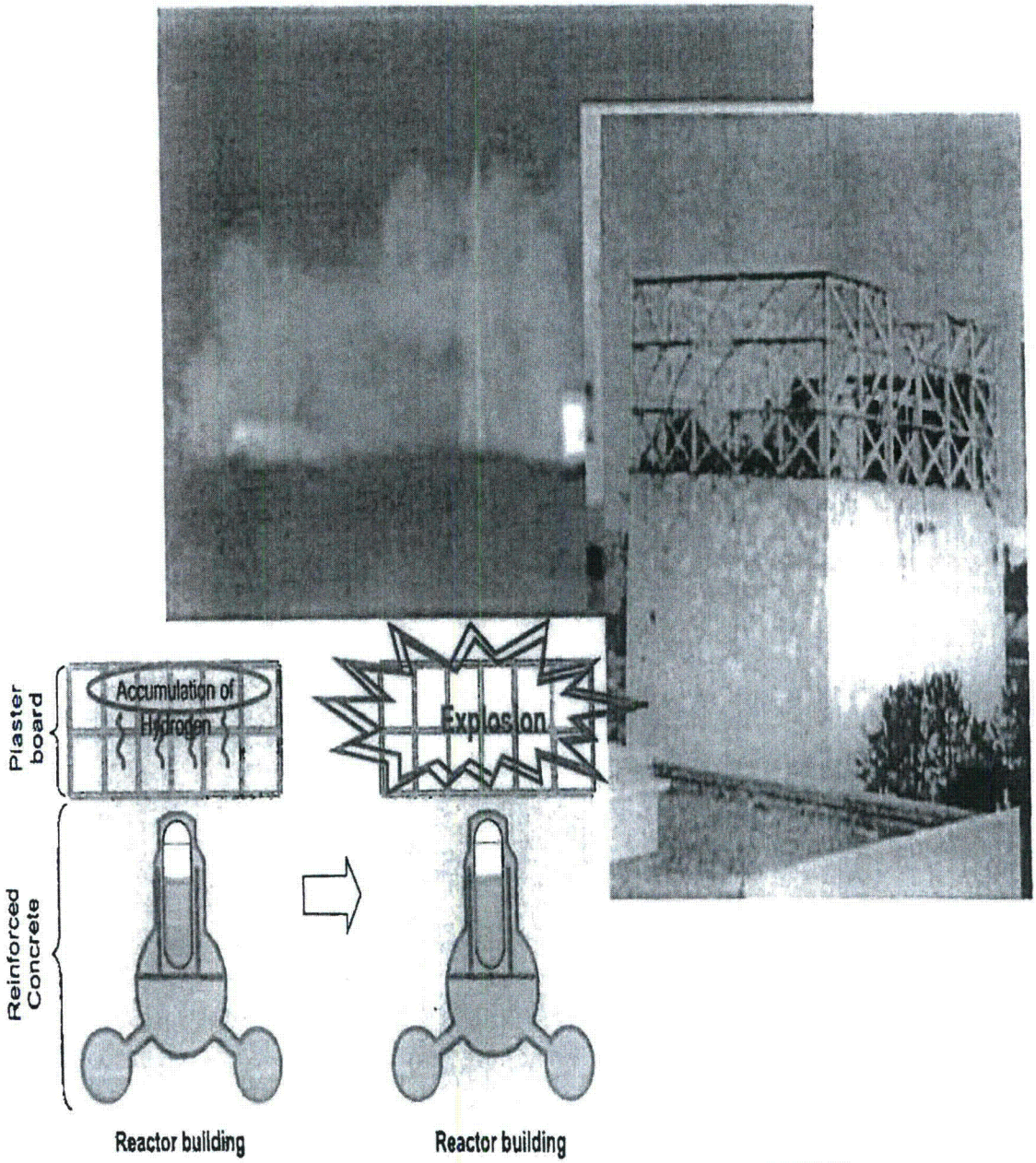


Unit 1 : PCV Venting and Cooling by Sea Water Injection

- S/C Venting to depressurize the PCV
- Sea water injection using fire water pump

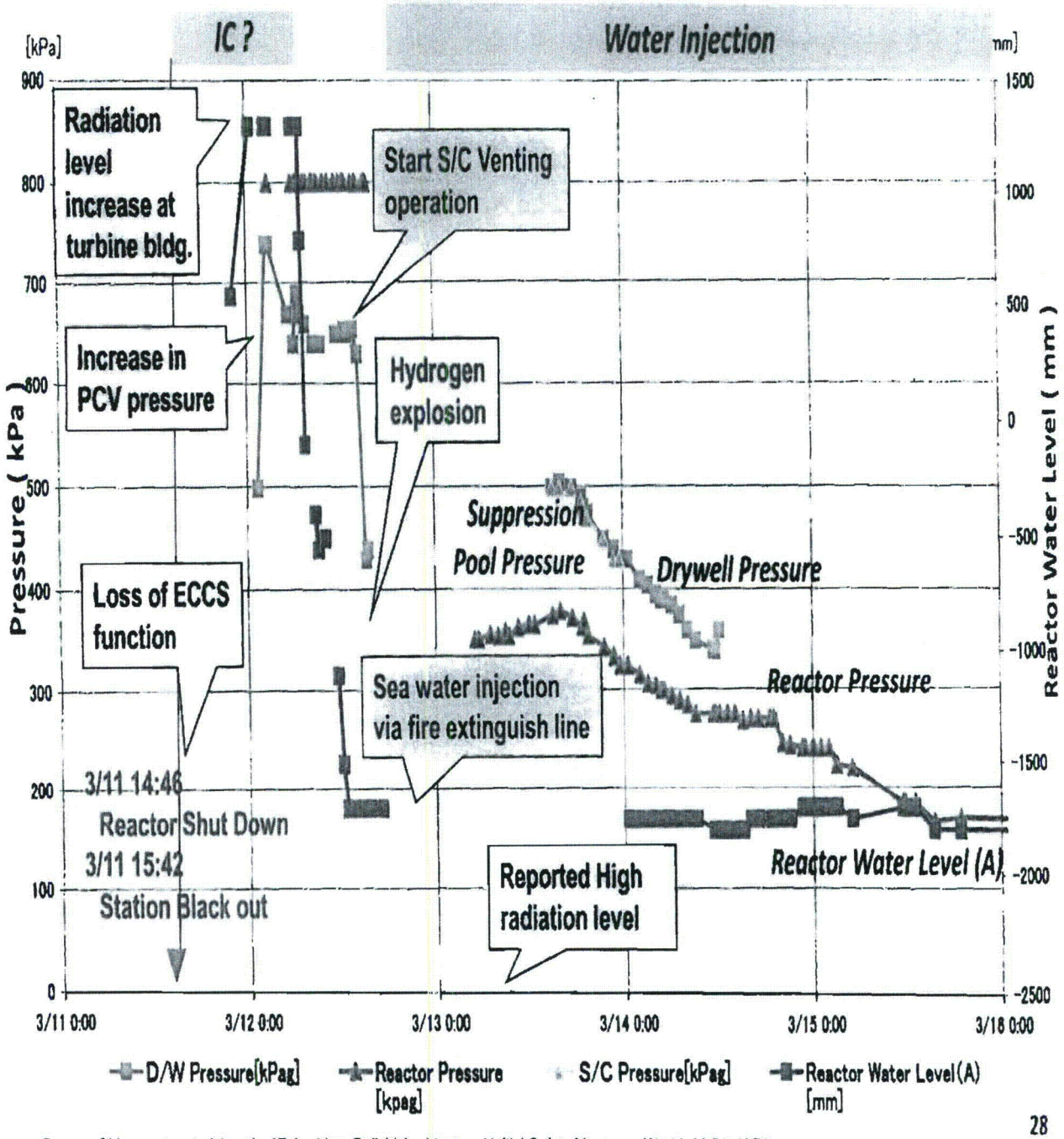


Hydrogen Explosion in the Operation Floor in Unit 1
- March 12, 15:36 -



Water Level in RPV, Pressure in RPV and PCV (D/W & S/C)

From March 11 to 16 in Unit 1

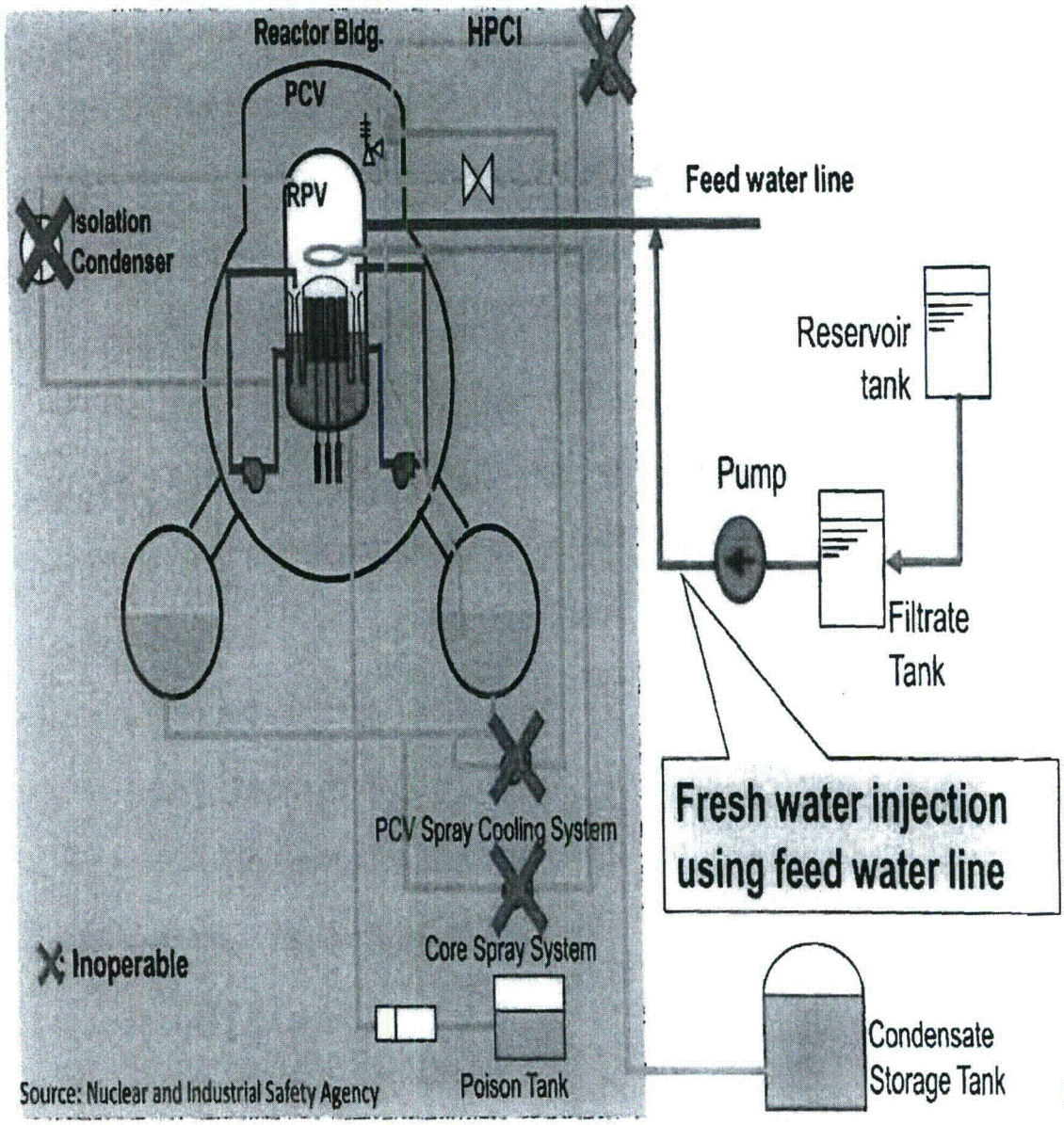


28

Source: Side event material on the "Fukushima Daiichi Accident and Initial Safety Measures Worldwide" in IAEA.

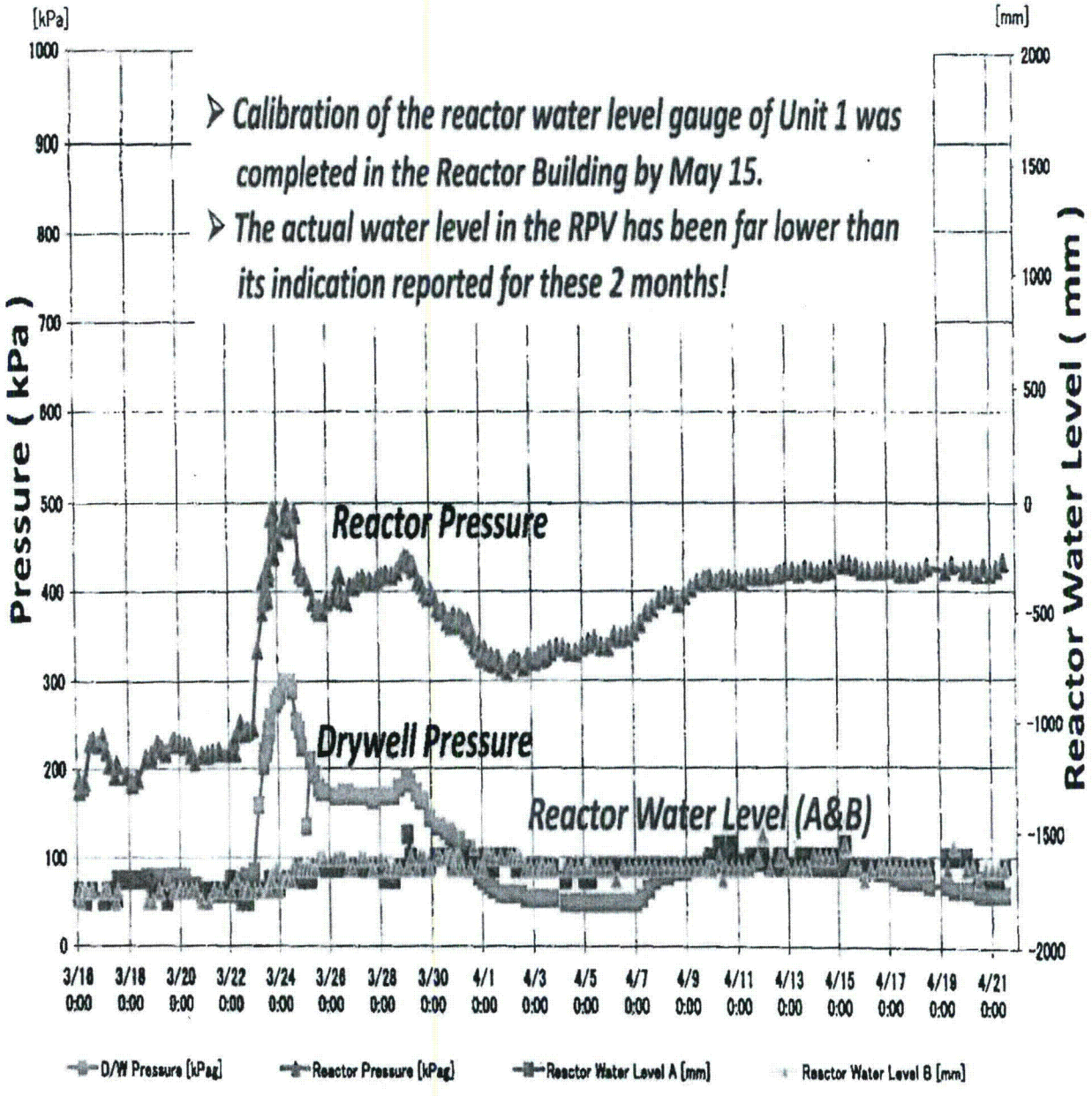
Unit 1 : Cooling

Switched to fresh water injection on March 25th



Reported Water Level in RPV, Pressure in RPV and PCV (D/W)

From March 16 to Apr. 21 in Unit 1

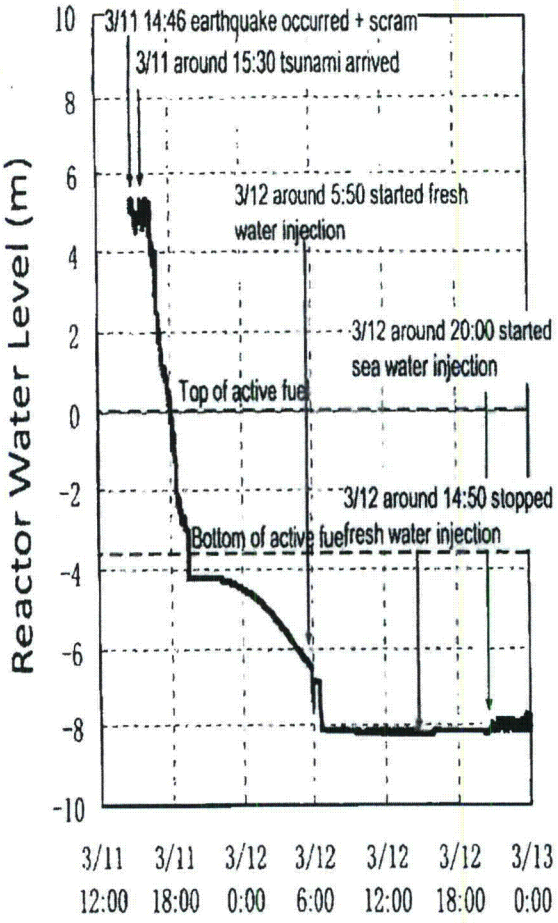


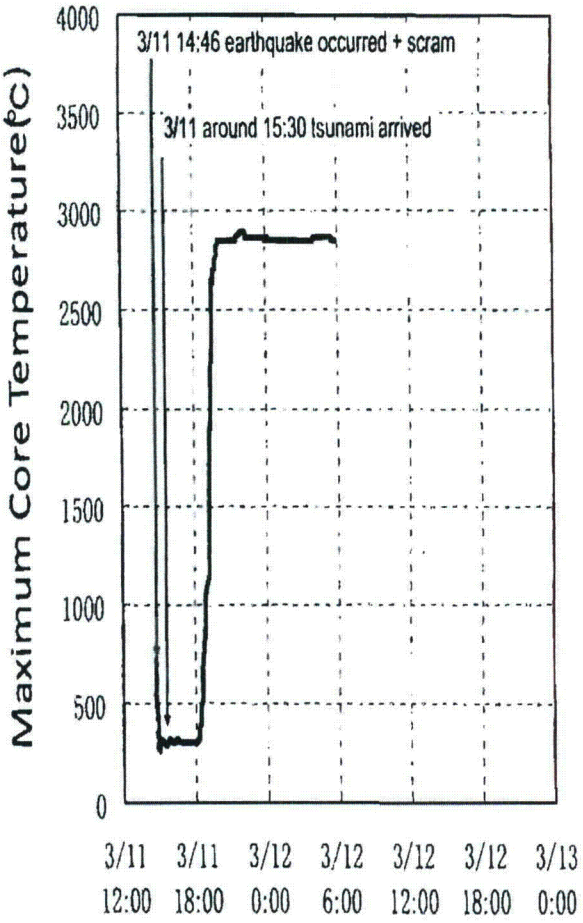
Source: NISA & TEPCO's press release.

※As TEPCO is currently reviewing all relevant plant parameter, above parameter in this chart may not be correct

Reactor Water Level and Core Temperature in Unit 1
- Simulation Trial by the MAAP code -

Assuming that IC lost its function by the Tsunami





- reached top of active fuel in 3 hours (around 18:00) after the scram
- reached bottom of active fuel in 4 and a half hours (around 19:30) after the scram

The core temperature started increasing when the reactor water level became lower than top of active fuel, then reached the core melting temperature.

31

Source: TEPCO

Transition of Core Status in Unit 1

- Simulation Trial Results by the MAAP code -

Degree of fuel damage

:Normal fuel

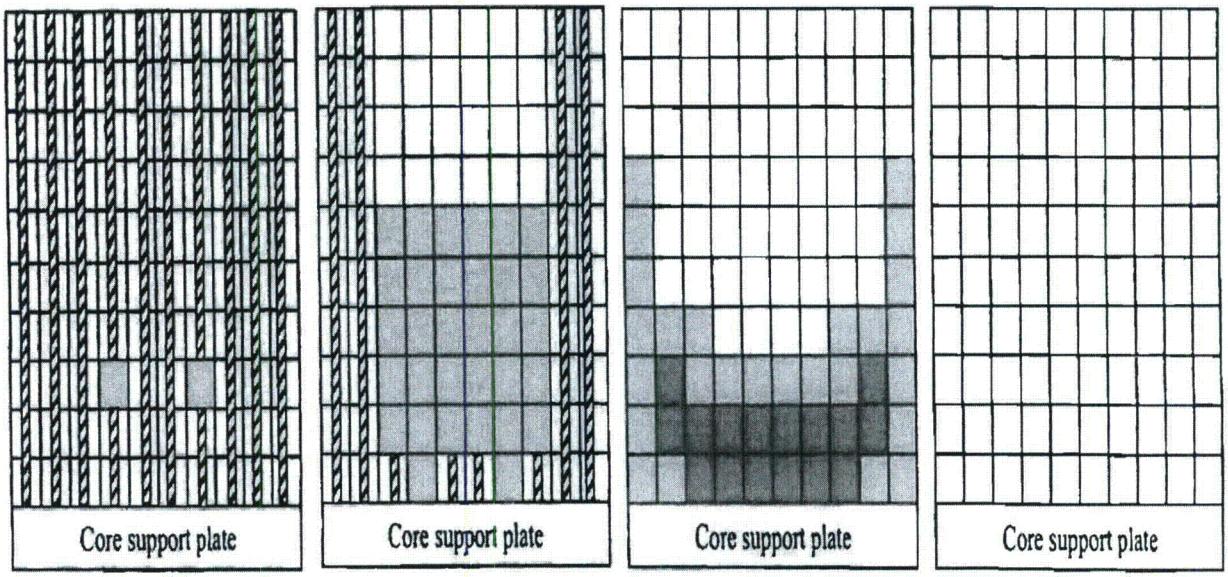
:Damaged fuel

:Fuel pellet melted

:Void (fuel melted down)

- *Melting starts from the central part of the core.*
- *In 16 hours after scram, most part of the core fell down to the RPV bottom.*
- *Although RPV is damaged in this provisional analysis, the actual damage of RPV is considered to be limited according to the temperatures presently measured around the RPV.*

Source: TEPCO



4.8 hours after scram (around March 11th 19:30)

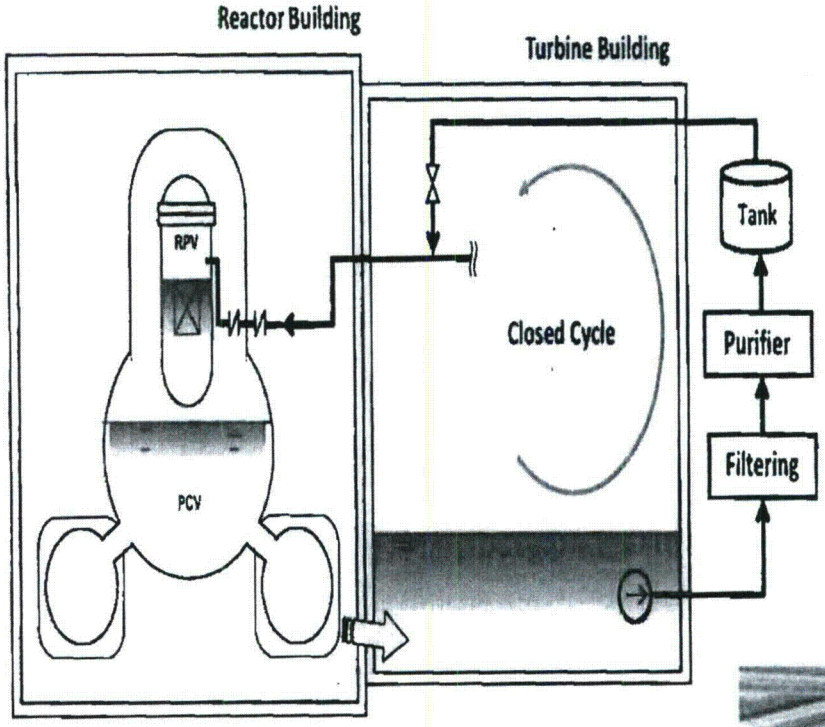
5.1 hours after scram (around March 11th 19:50)

15.1 hours after scram (around March 12th 6:00)

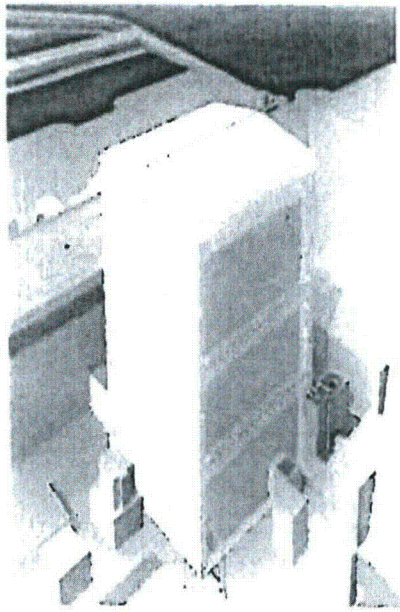
16.0 hours after scram (around March 12th 6:50)

Comparison of simulation results and their sensitivity on input parameters from other severe accident analysis codes like MELCOR and THALES should also be made.

System outline of water reuse as reactor coolant by processing accumulated water

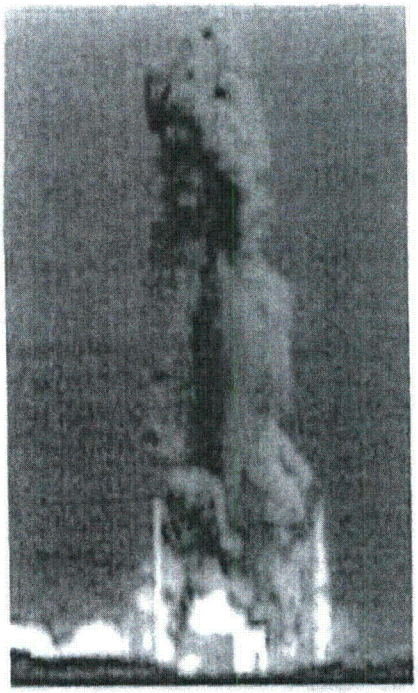


Reactor Building Cover for Unit 1



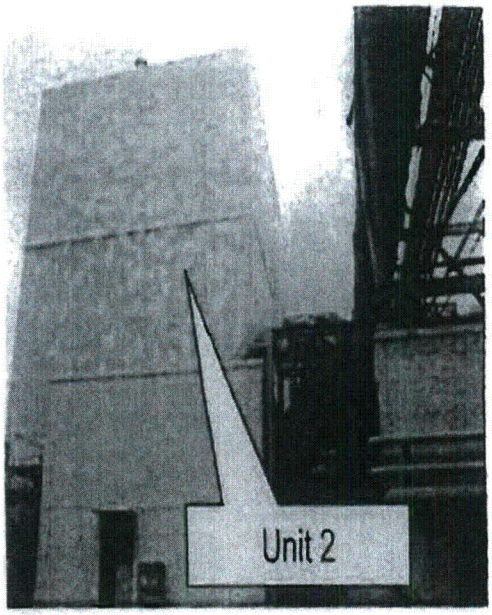
Source: TEPCO

Unit 3

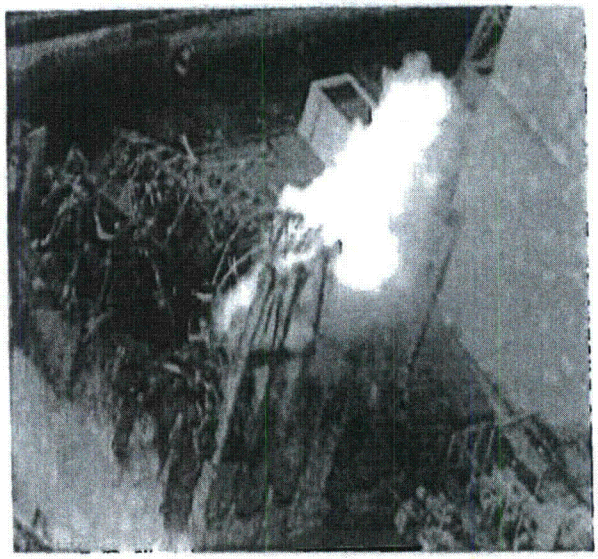


Hydrogen explosion at Unit 3 on March 14

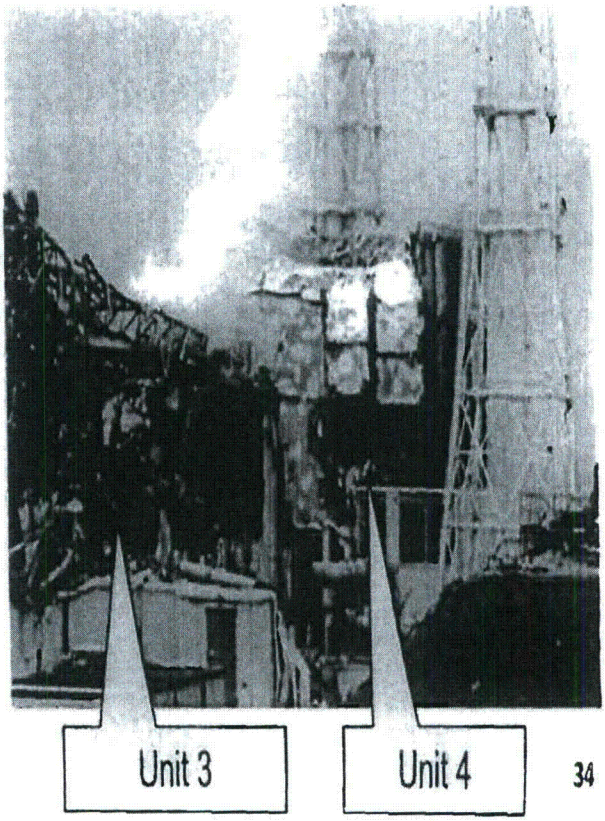
Unit 2



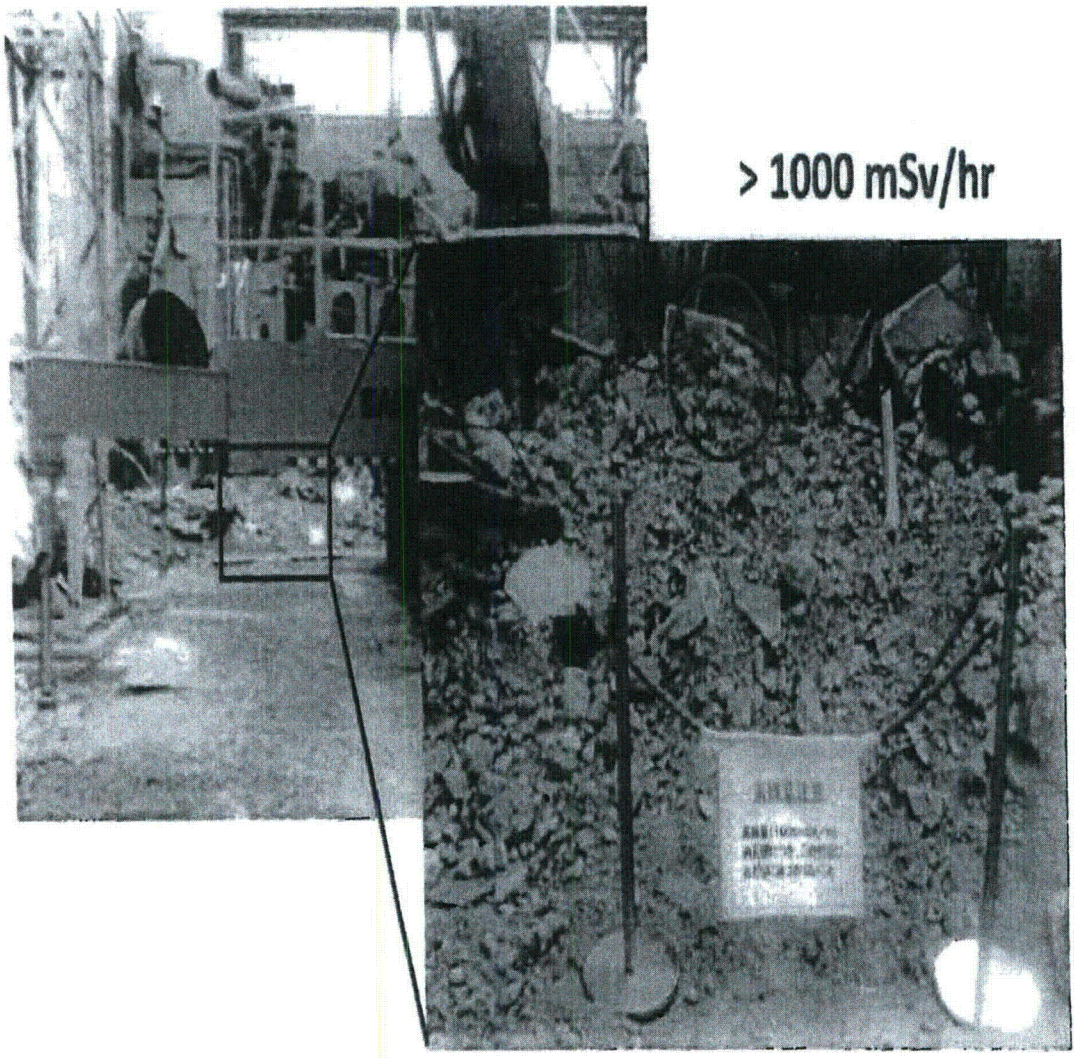
Explosion sound at Unit 2 on March 15



Source: TEPCO



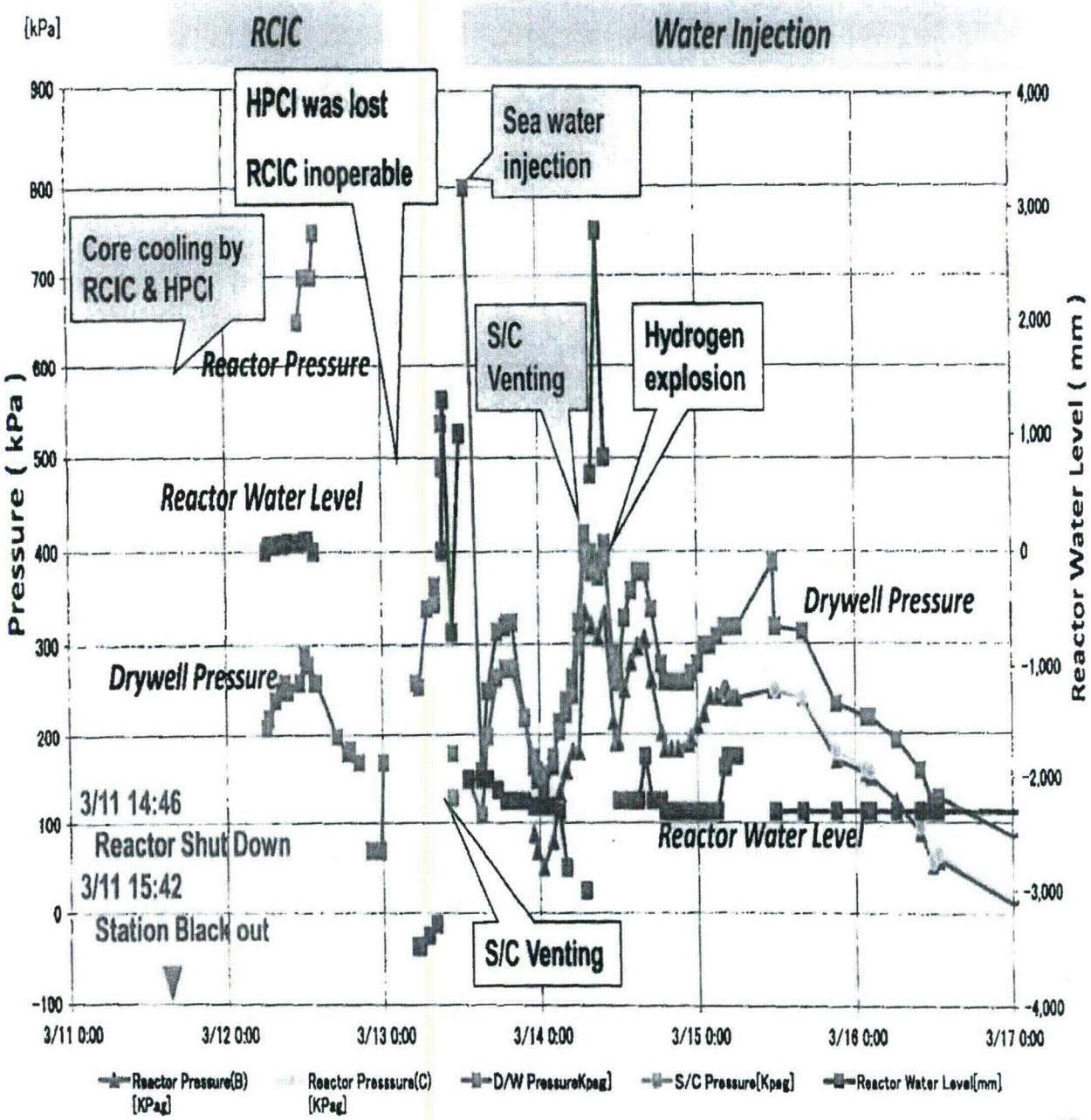
Highly Radioactive Debris near Unit 3



Source: TEPCO

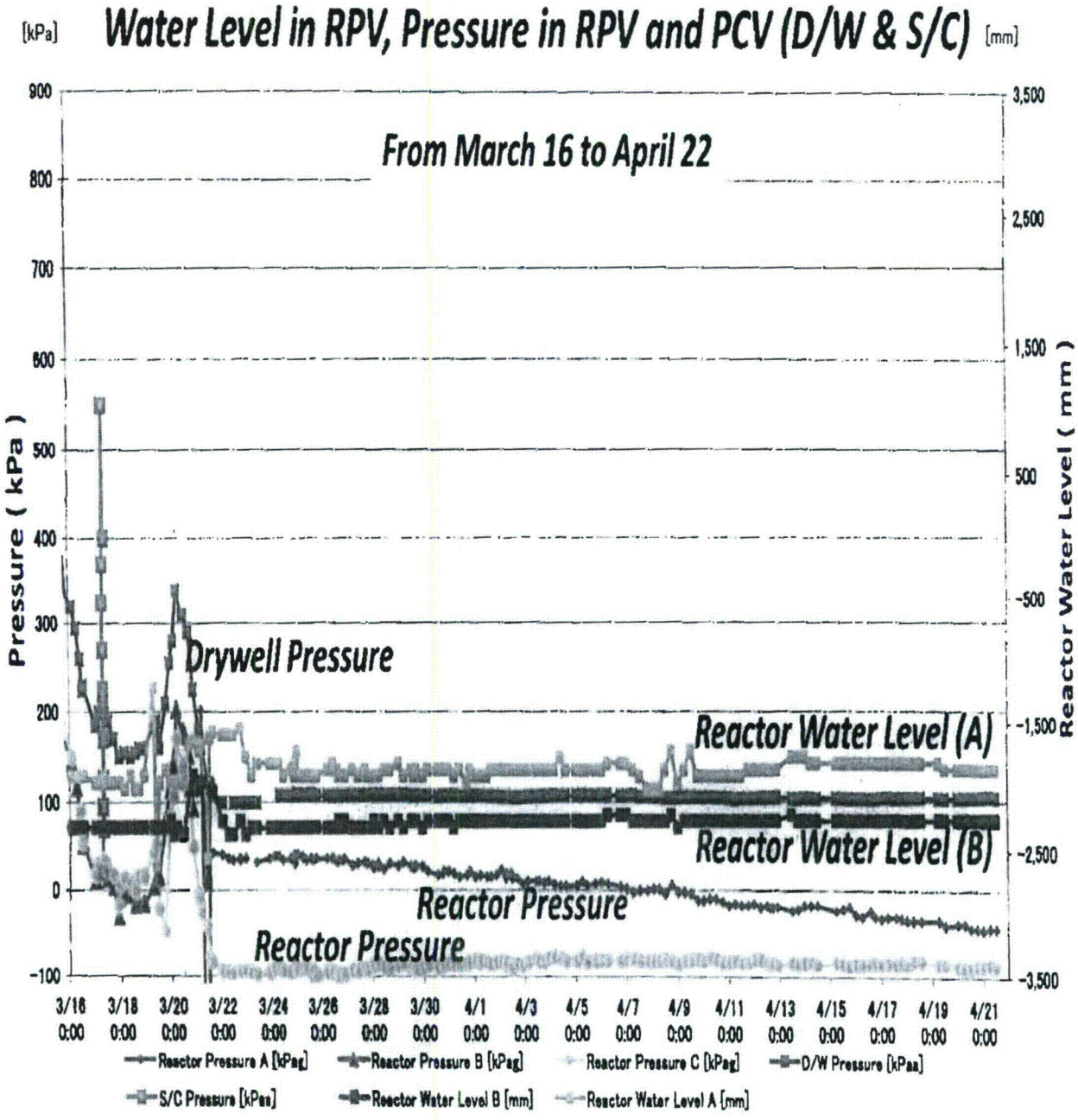
Unit 3 Water Level in RPV, Pressure in RPV and PCV

From March 11 to 17



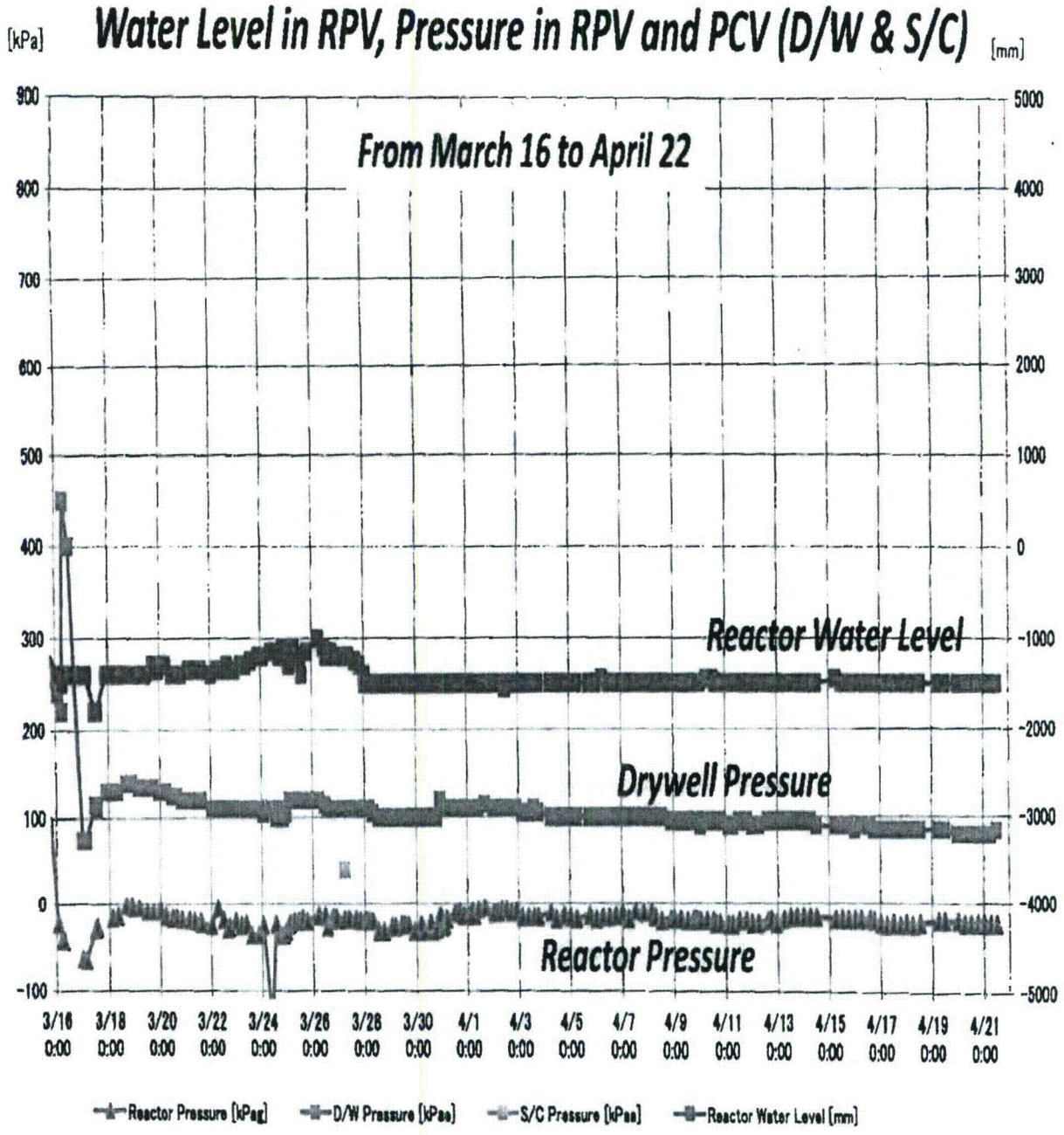
Source: Side event material on the "Fukushima Daiichi Accident and Initial Safety Measures Worldwide" in IAEA

Unit 3



Source: NISA & TEPCO's press release

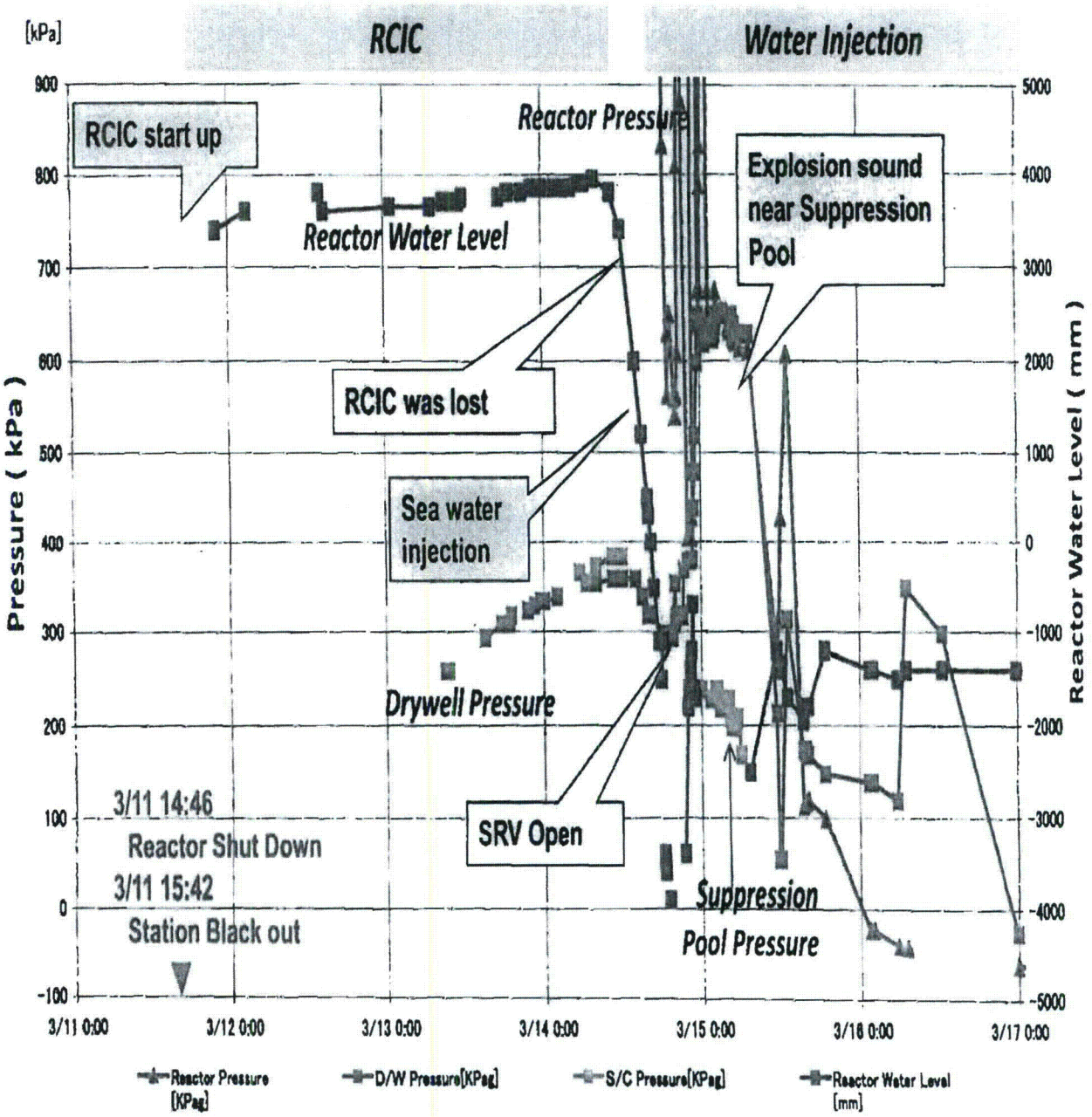
Unit 2



Source: NISA & TEPCO's press release.

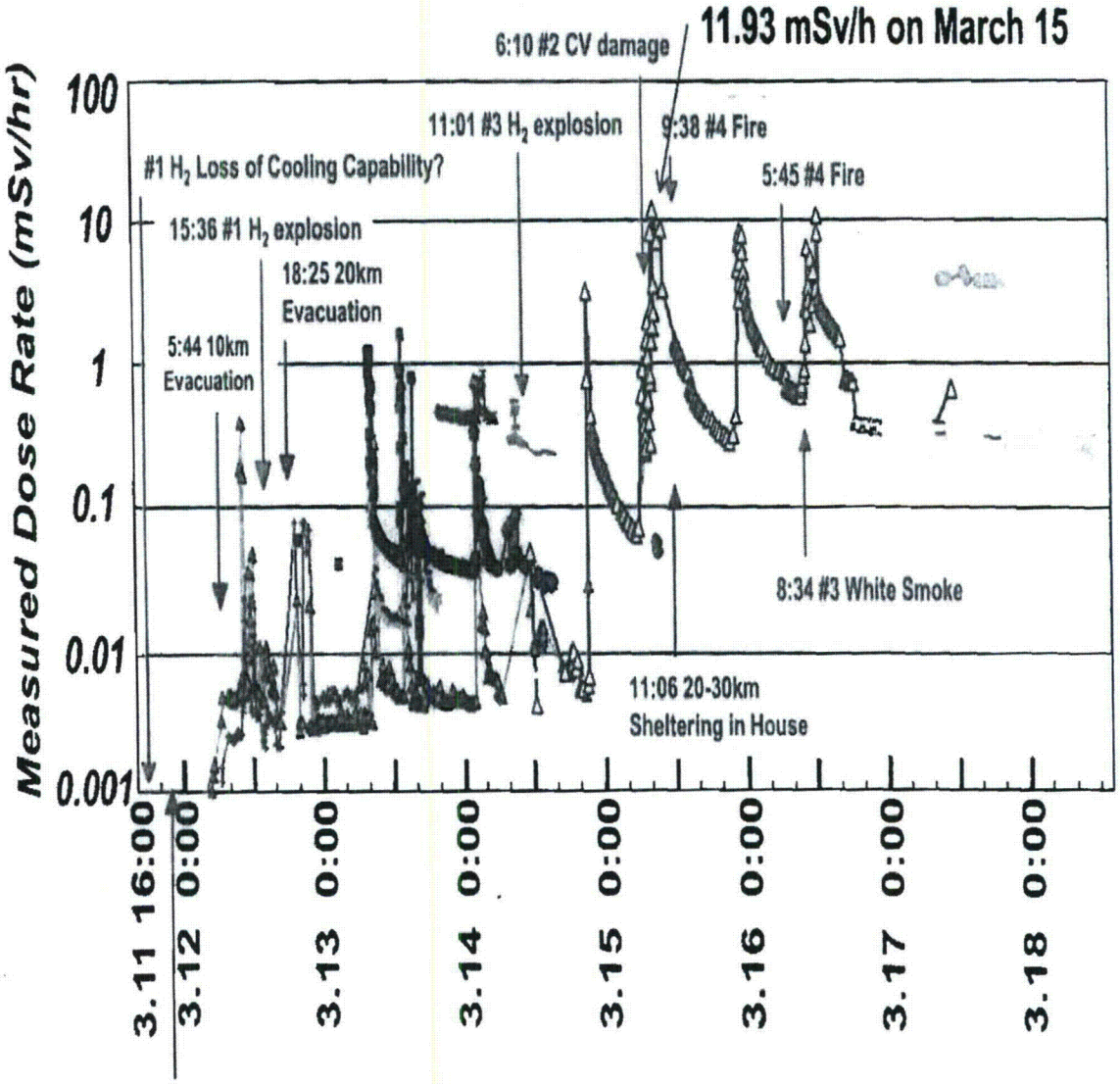
Unit 2 Water Level in RPV, Pressure in RPV and PCV (D/W & S/C)

From March 11 to 17



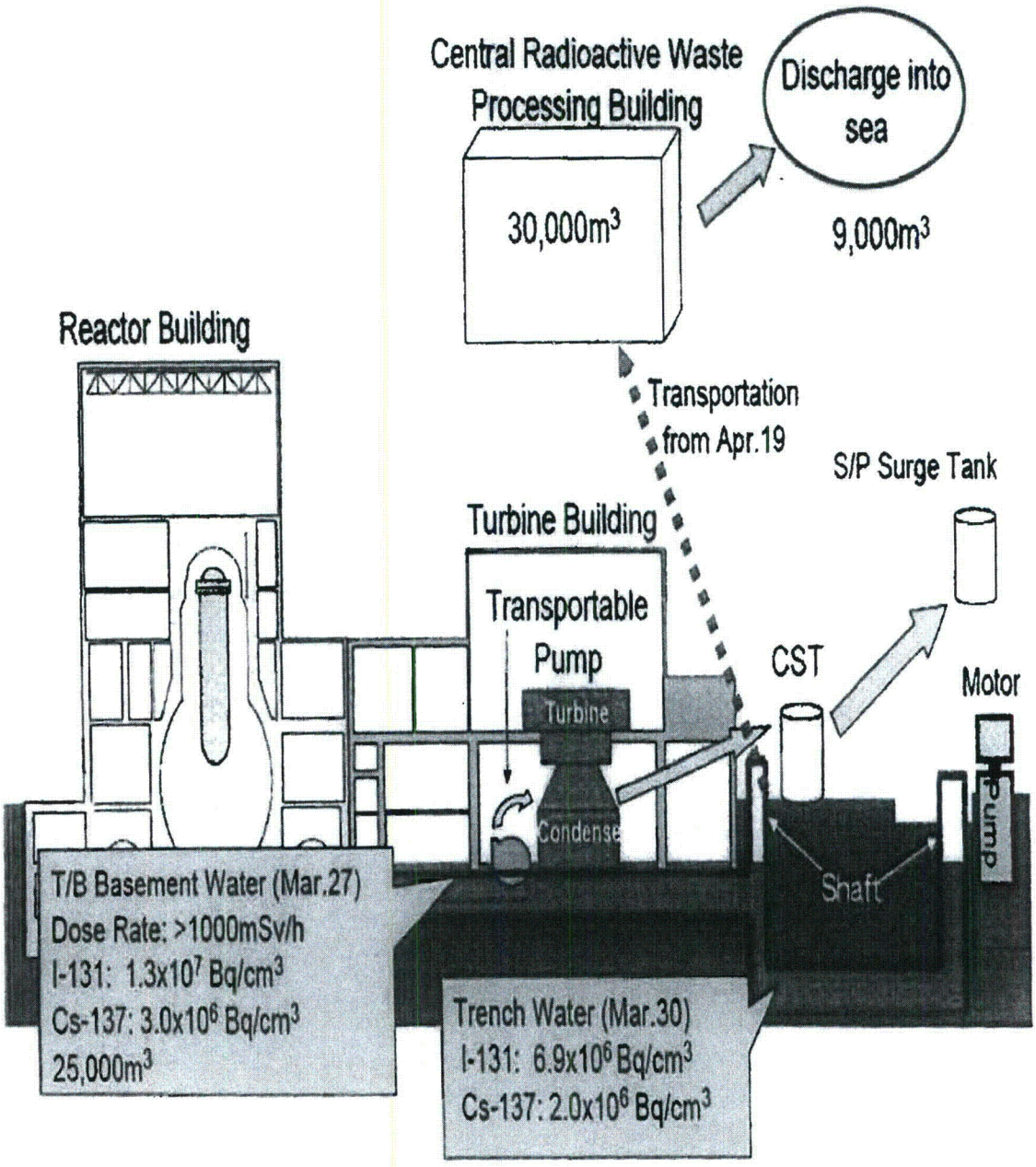
Source: Side event material on the "Fukushima Daiichi Accident and Initial Safety Measures Worldwide" in IAEA.

On-site Radiation Monitoring in Fukushima Daiichi Site From March 11 to 18



20:50 2km Evacuation (Fukushima Pref.)
21:23 3km Evacuation & 3-10 km Sheltering in House

Measures against Water Puddles at Fukushima Daiichi



Source: TEPCO

Leakage of Highly Radioactive Water from Unit 2

Leakage of radioactive water to the ocean between Apr. 1 to 6 from the pit of Unit 2

Amount of Released Water : 520 m^3

Concentration of Radioactive Materials

I-131 : 5.4×10^4 Bq/cm^3
Cs-134 : 1.8×10^4 Bq/cm^3
Cs-137 : 1.8×10^4 Bq/cm^3

Total Released Radioactivity

I-131 : 2.8×10^{15} Bq
Cs-134 : 9.4×10^{14} Bq
Cs-137 : 9.4×10^{14} Bq

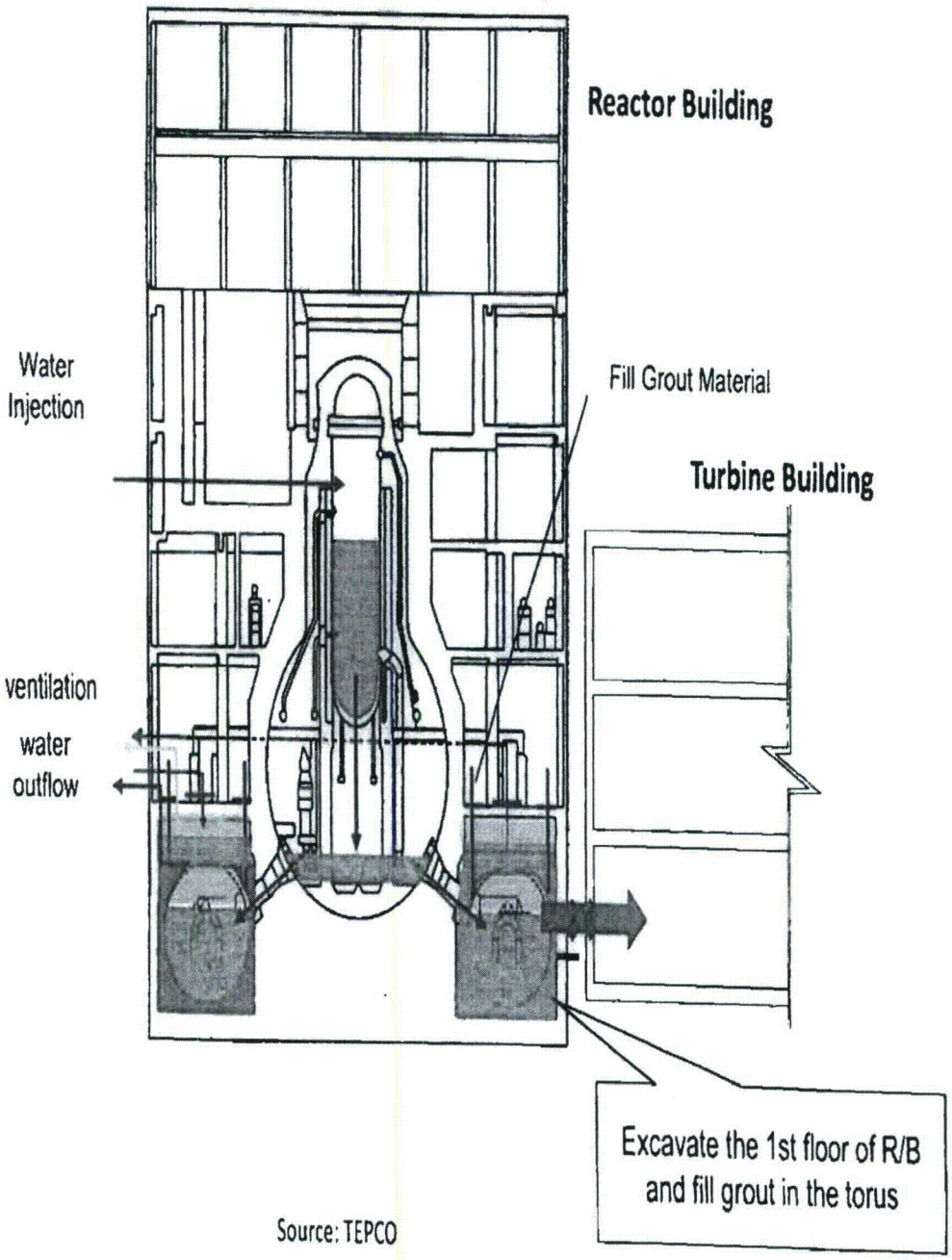
Source: TEPCO

Countermeasures

-Drilled a hole into the pit and injected water glass (sodium silicate) into the pit.

-By April 6, the outflow was confirmed to stop.

Countermeasure to Seal the Damaged Location in the PCV of the Unit 2



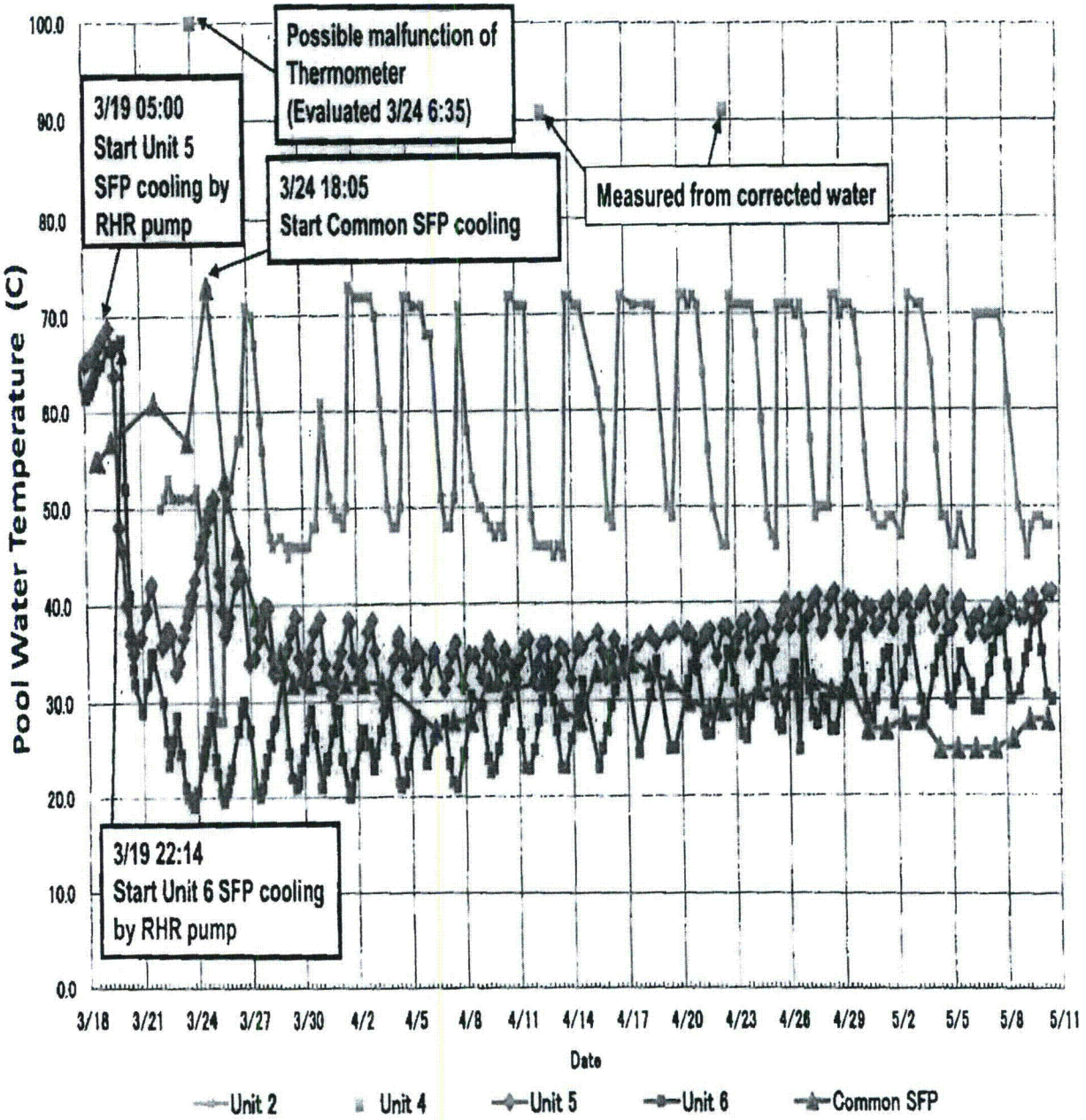
Source: TEPCO

Fuel Assemblies in Core and Spent Fuel Pool

Unit	1	2	3	4	5	6
Number of Fuel Assembly in the Core	400	548	548*	-	548	764
Number of Spent Fuel Assembly in the SFP	292	587	514	1,331	946	876
Number of New Fuel Assembly in the SFP	100	28	52	204	48	64
Water Volume (m^3)	1,020	1,425	1,425	1,425	1,425	1,497
Heat Generation in Spent Fuel Pool (MW)	0.07	0.47	0.23	2.3	0.08	0.07

* including 32 MOX Fuel Assembly

Temperature History of Spent Fuel Pools



Source: NISA & TEPCO's press release

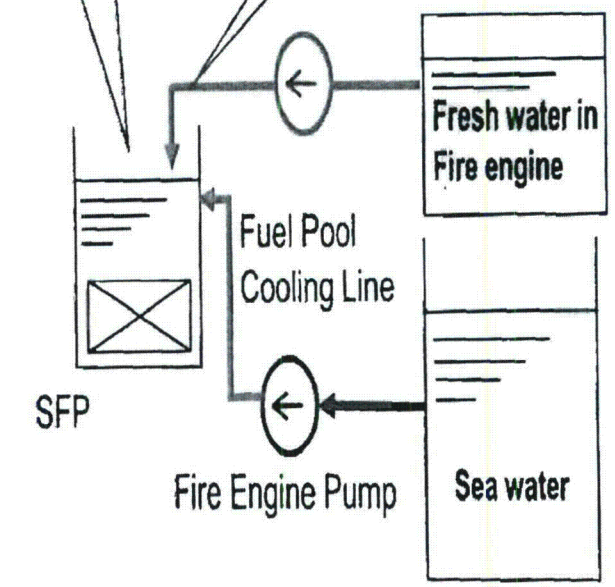
Unit 3 : Spent Fuel Pool Cooling

【1st Stage】Sea water injection

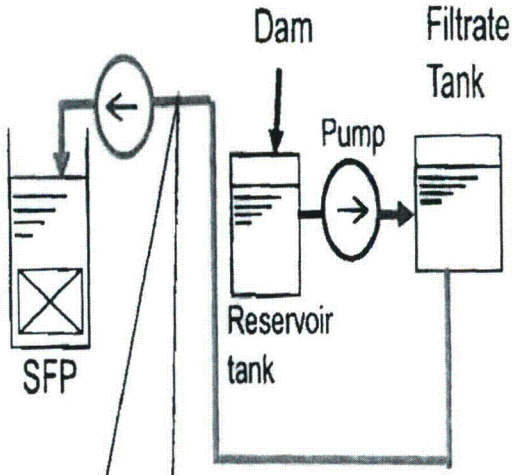
asahi.com

Discharge of Sea water
-Self-Defense Force

Water Spray
by
-Self-Defense Force
-Fire Department
-Police



【2nd Stage】Fresh water injection

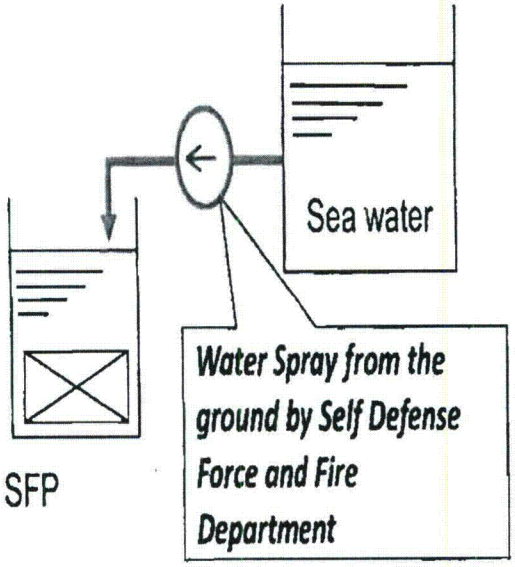


Water spray using concrete pump truck

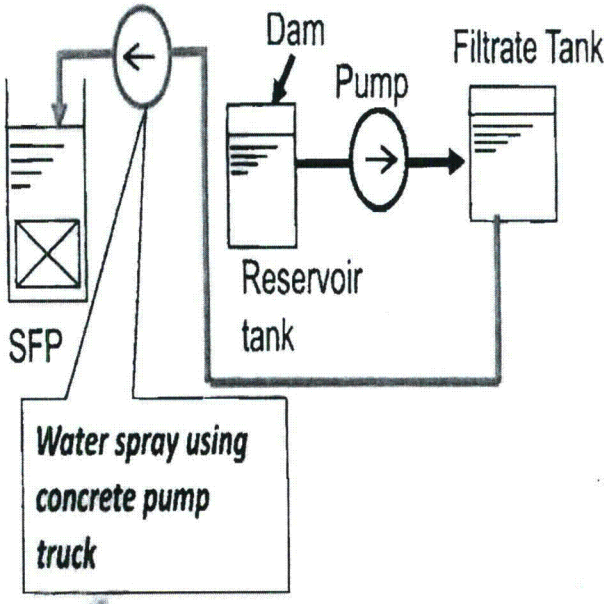
Source: Nuclear and Industrial Safety Agency

Unit 4 : Spent Fuel Pool Cooling

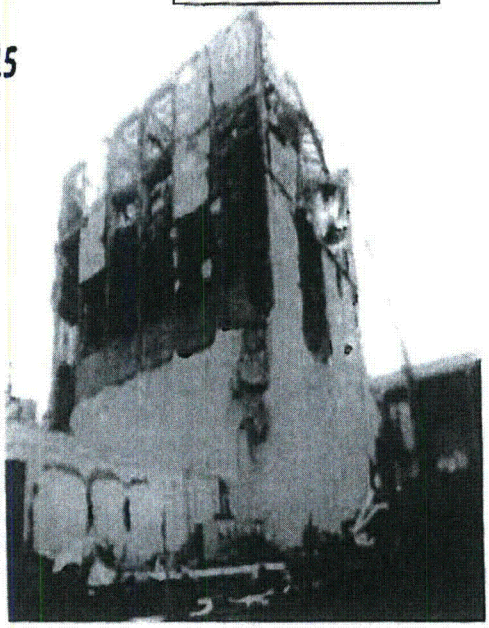
【1st Stage】 Sea water injection



【2nd Stage】 Fresh water injection



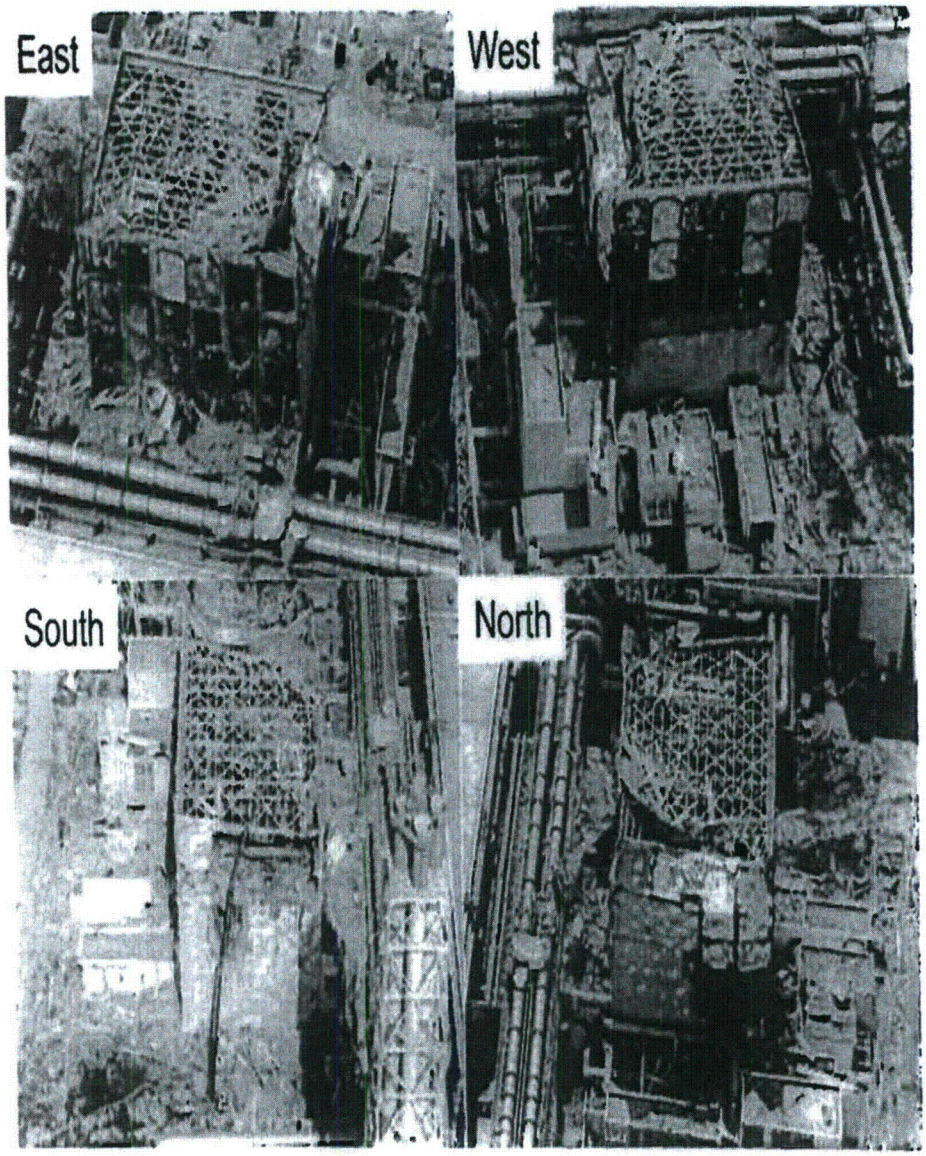
- ***Reactor building damage on March 15***



Source: Nuclear and Industrial Safety Agency

Hydrogen Explosion in Unit 4 ?

Possible mechanisms ; (1) Zr-H_2O reaction in the SFP, (2) H_2 from Unit 3,
(3) Decomposition of H_2O into H_2 and O_2 under radiation



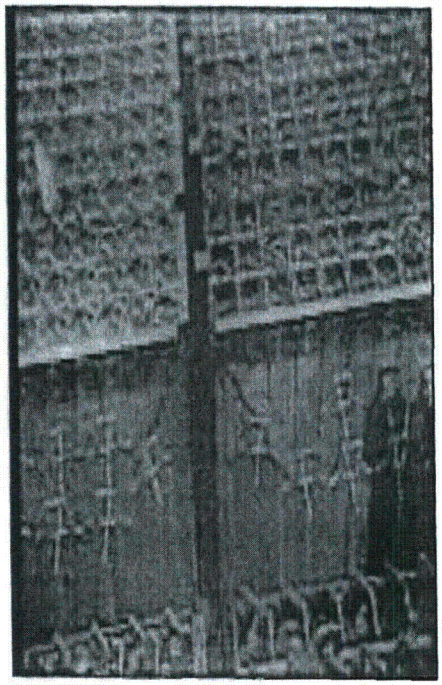
Unit 4 : Spent Fuel Pool

- *No significant damage was identified by underwater camera inspection*
- *Water sampling on April 12 also shows relatively low radioactivity in SFP water*

Analysis result of water in the SFP of Unit 4
(Date of Collection 4/12)

Detected Nuclides	Half life	Density (Bq/cm^3)
Cesium 134	Approx. 2 Years	88
Cesium 137	Approx. 30 Years	93
Iodine 131	Approx. 8 Days	220

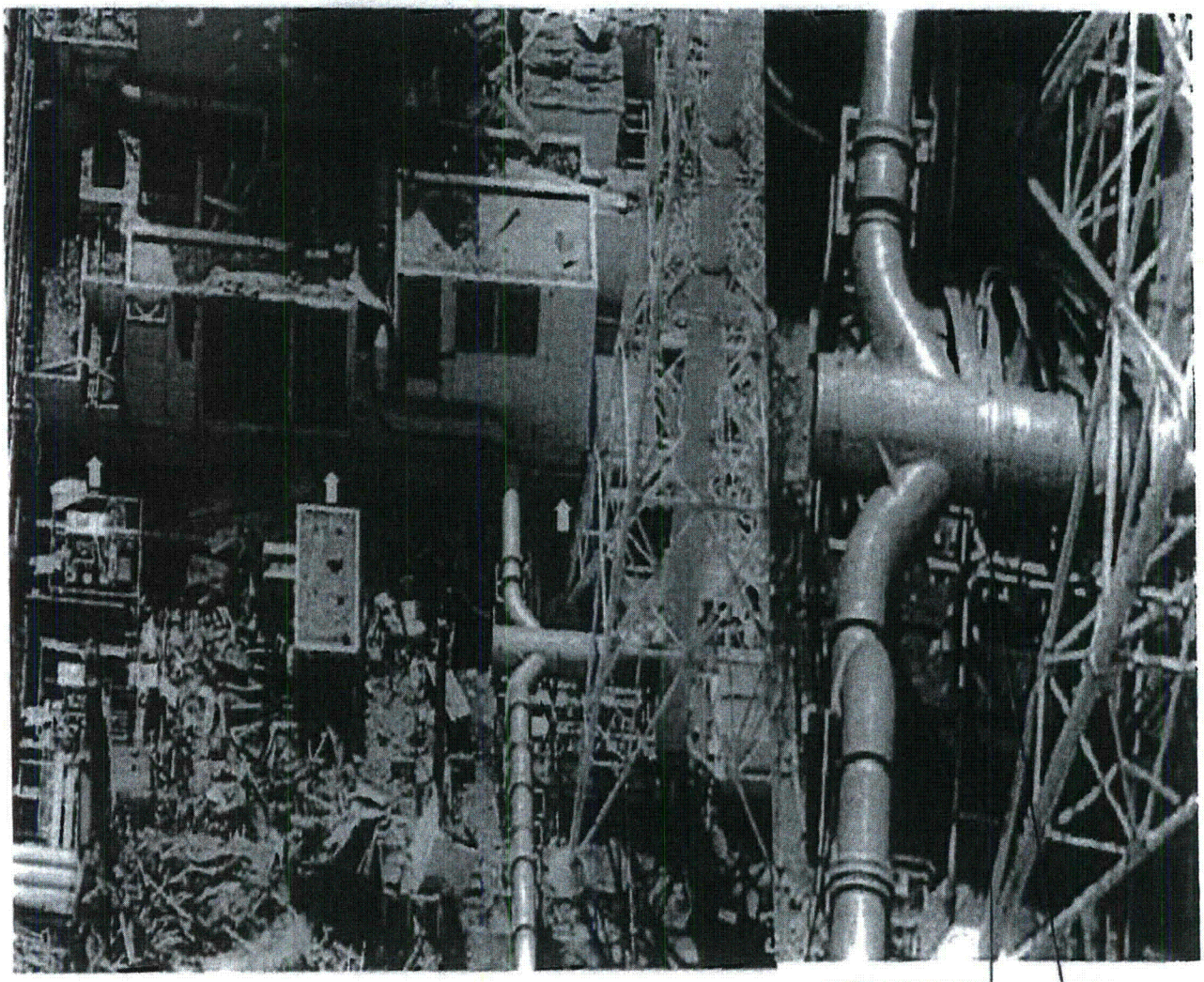
Source: TEPCO

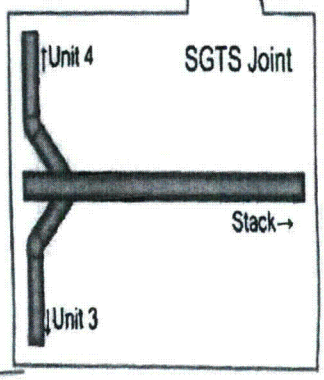


Source: TEPCO

~~Zr-H_2O~~ reaction in the SFP at high temperature

Stand-by Gas Treatment Systems for Units 3 and 4

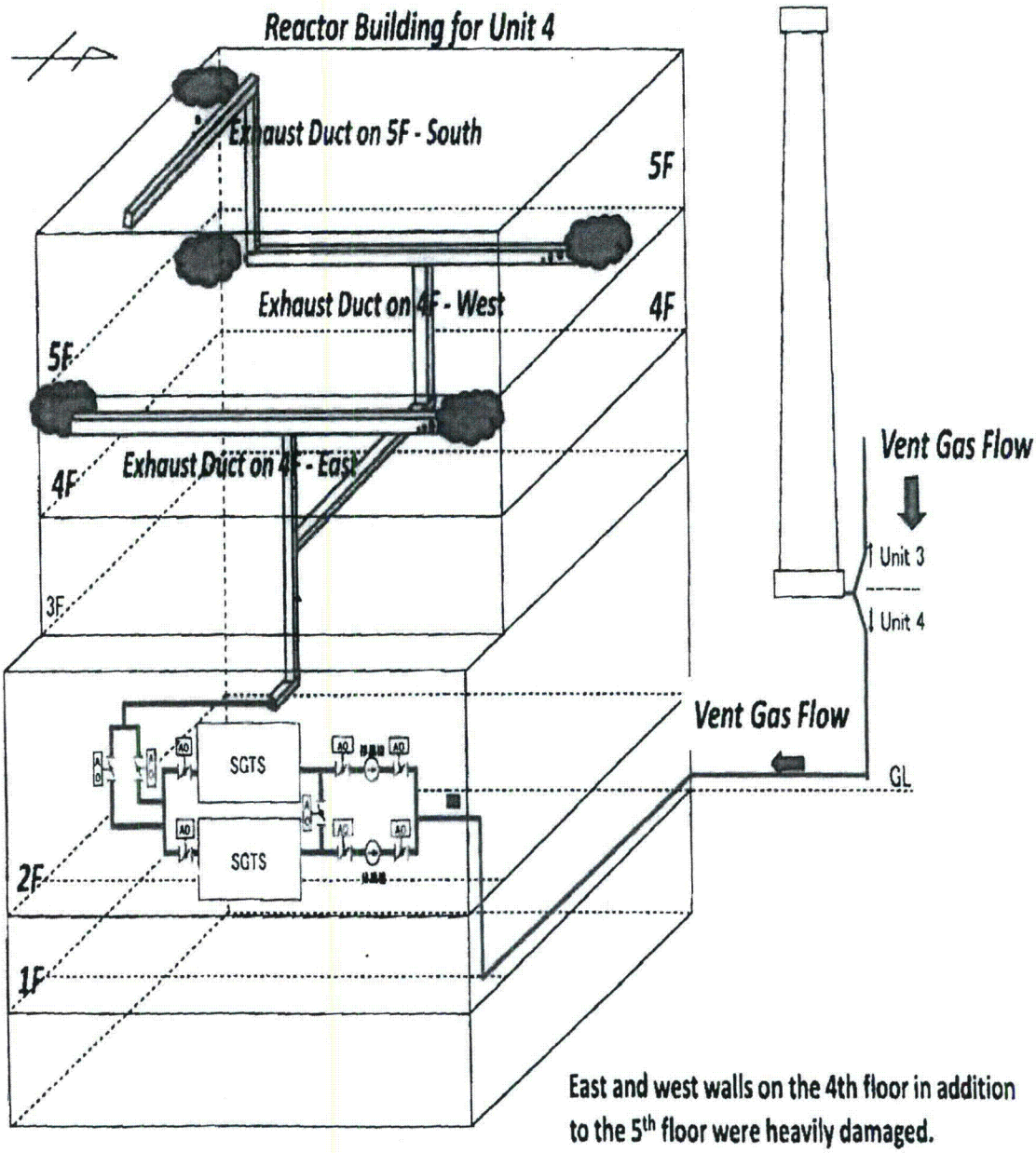




Pipes of stand-by gas treatment systems for Units 3 and 4 are connected.

Source: TEPCO

Possible Mechanism of Hydrogen Explosion in Unit 4



East and west walls on the 4th floor in addition to the 5th floor were heavily damaged.

Source: TEPCO

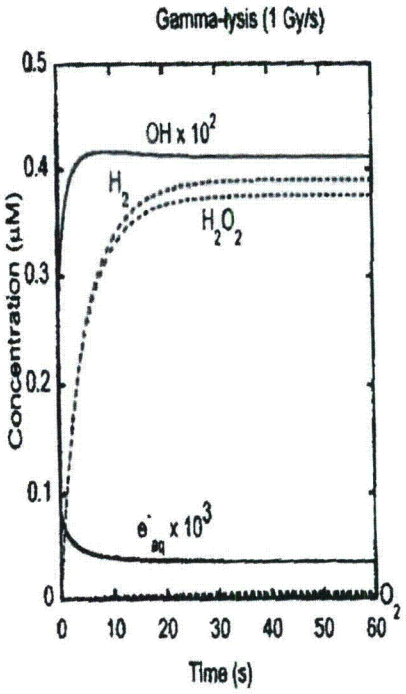
Experiments on High Concentration of Hydrogen Gas under Radiation at Boiling Temperature

G-values	$-H_2O$	e_{aq}	OH	H	H_2O_2	H_2	HO_2
Gamma-ray	4.1	2.7	2.8	0.56	0.68	0.45	~0.01
Alpha-ray	2.65	0.06	0.24	0.21	0.985	1.3	0.22

May 16, 2011

Prof. Katsumura Group

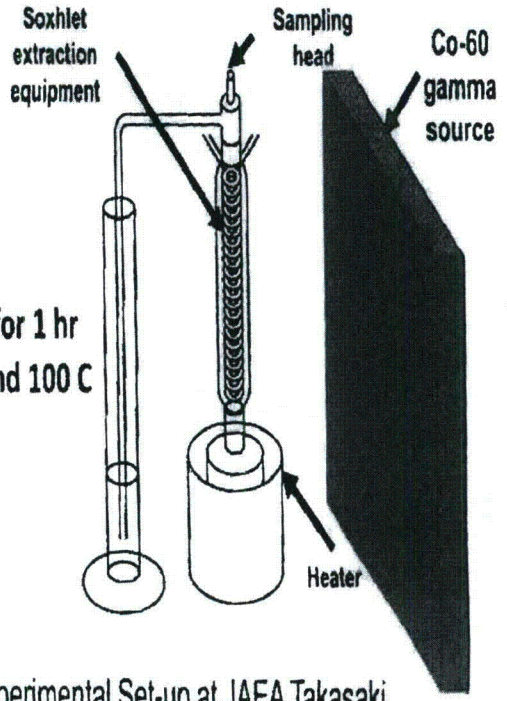
The University of Tokyo and JAEA



Typical BWR condition simulation of radiation chemistry reactions considering the reaction between H_2 and OH, resulting in steady state concentration of H_2.

New Finding by H_2 production under irradiation;

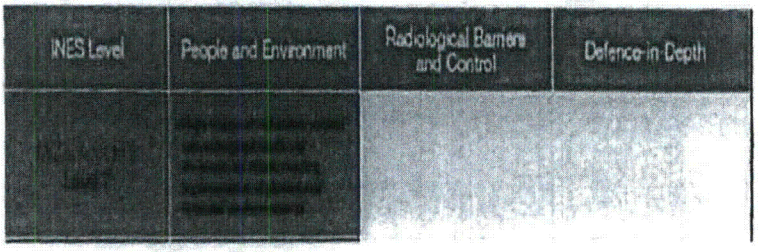
- *Effective transfer of H_2 into gas phase at 100 C*
- *High concentration of H_2 through condensation of H_2O at lower temperature region*



6.8 kGy/h for 1 hr at 80, 97 and 100 C

Experimental Set-up at JAEA Takasaki

INES (International Nuclear Event Scale) Evaluation



- NISA issued provisional INES ratings , based on "What is known" at the time.
- At first, following units were rated as Level 3 based on "Defense in Depth" criteria about 10 hours later from the earthquake.
  - Fukushima Daiichi Units 1, 2 and 3, Fukushima Daini Units 1, 2 and 4
- In the evening on March 12, the rating of Fukushima Daiichi Unit 1 was re-evaluated to Level 4 base on the "Radiological Barriers and Control" criteria.
- On March 18, Fukushima Daiichi Units 1, 2 and 3 were re-rated to Level 5 based on "Radiological Barriers and Control" criteria because the fuel damage was highly possible. Fukushima Daiichi Unit 4 was evaluated to Level 3 based on the "Defense in Depth" criteria.
- On April 12, Fukushima Daiichi NPPs was revised Level 7 based on the "People and Environment" criteria, as a result of discharged estimation.
- Official rating will be done after cause and countermeasures are identified.

INES (International Nuclear Event Scale) Evaluation

- On April 12, Nuclear and Industrial Safety Agency (NISA) released;
  - Tentatively assigned Level 7 on INES for the accident at Fukushima Daiichi Nuclear Power Station.
  - The amount of released radioactive material is one-tenth as much as the accident at Chernobyl.

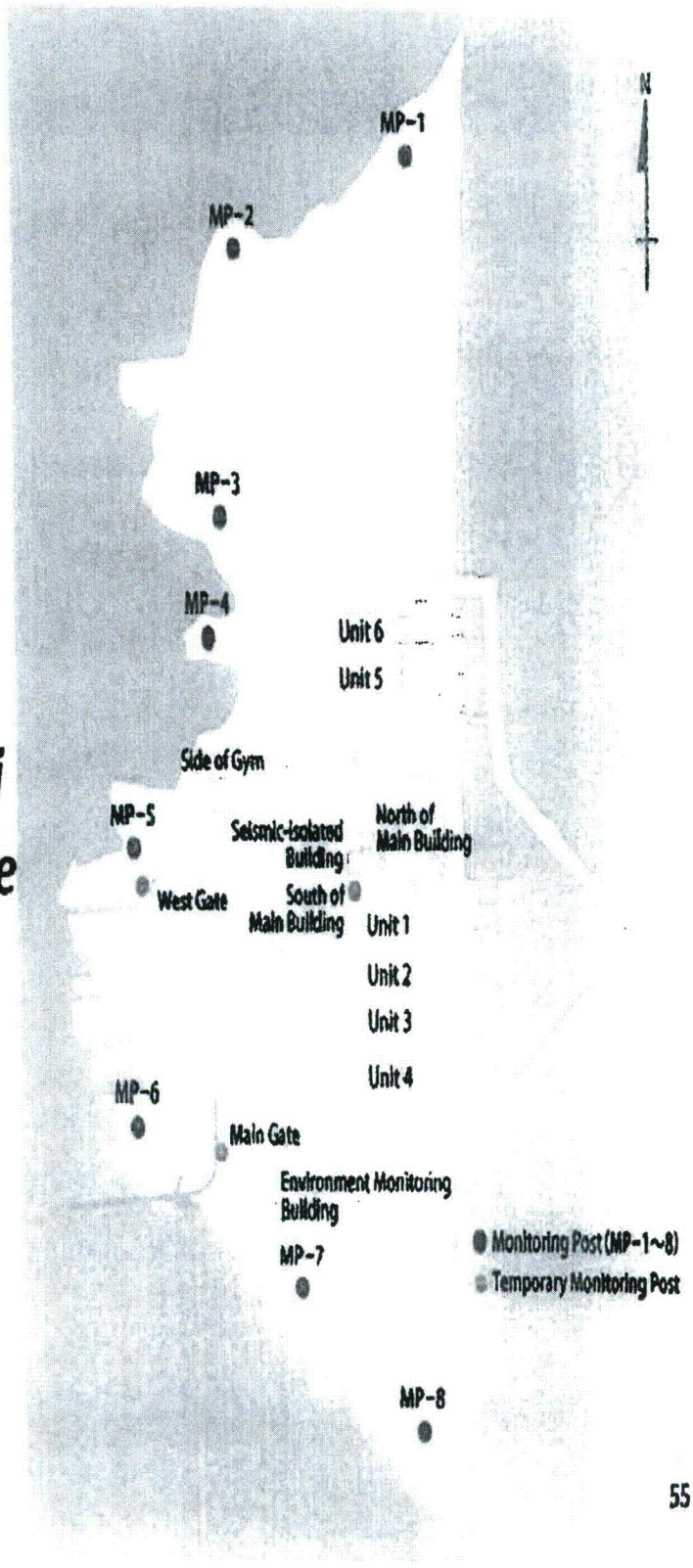
	Estimated release from Fukushima Daiichi		(Reference) Release from Chernobyl
	by NISA	by Nuclear Safety Commission	
Iodine 131 (a)	130 thousands T Bq ($1.3X10^{17}$Bq)	150 thousands T Bq ($1.5X10^{17}$Bq)	1,800 thousands T Bq ($1.8X10^{18}$Bq)
Cesium 137	6 thousands T Bq ($6.0X10^{15}$Bq)	12 thousands T Bq ($1.2X10^{16}$Bq)	85 thousands T Bq ($8.5X10^{16}$Bq)
Iodine value conversion (b)	240 thousands T Bq ($2.4X10^{17}$Bq)	480 thousands T Bq ($4.8X10^{17}$Bq)	3,400 thousands T Bq ($3.4X10^{18}$Bq)
(a) + (b)	**370 thousands T Bq ($3.7X10^{17}$Bq)**	**630 thousands T Bq ($6.3X10^{17}$Bq)**	**5,200 thousands T Bq ($5.2X10^{18}$Bq)**

INES level 7 equivalent : over 10 thousands Tera Becquerel (T Bq) (over 10^{16}Bq)

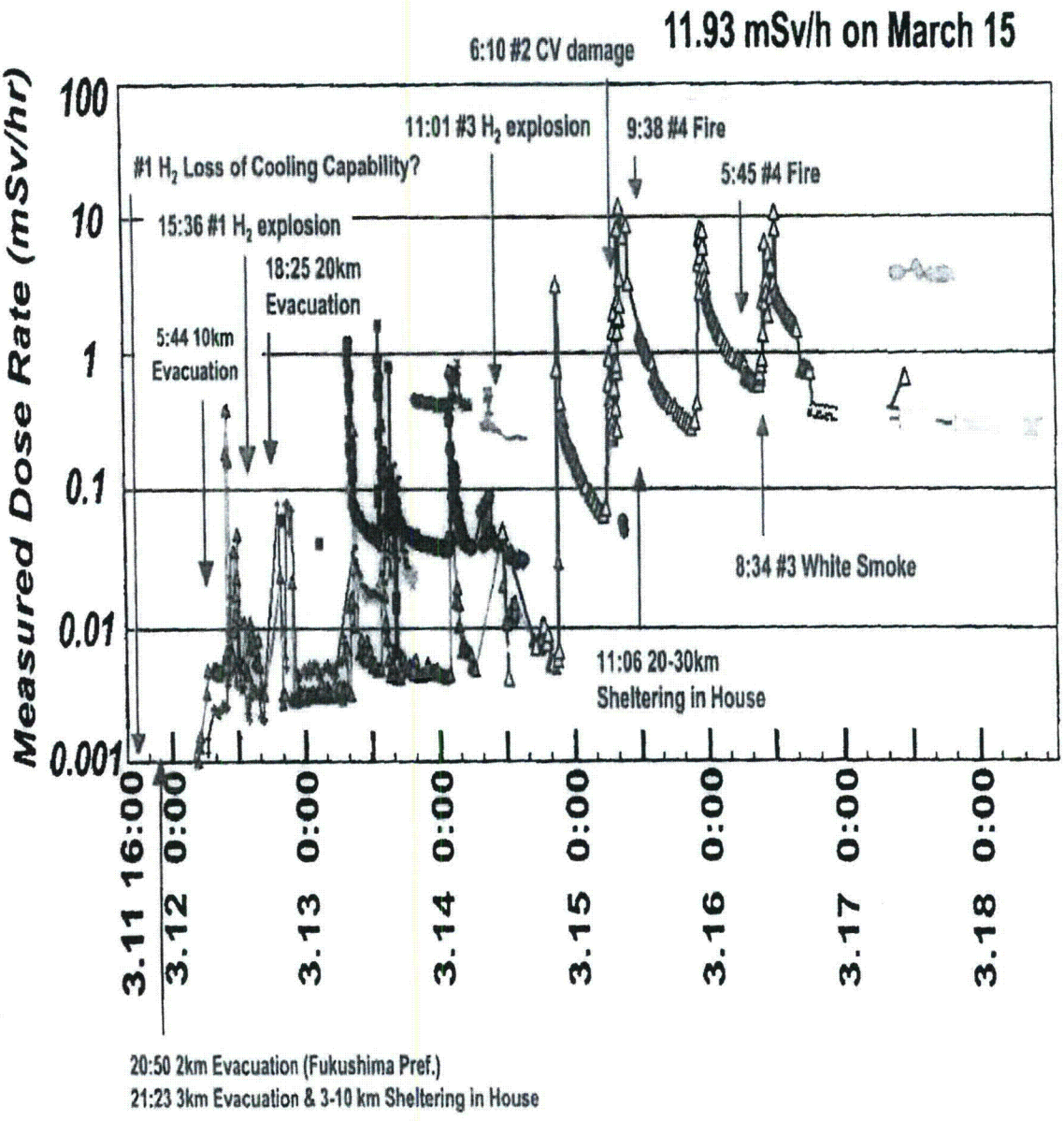
Source: Nuclear and Industrial Safety Agency

Monitoring Posts

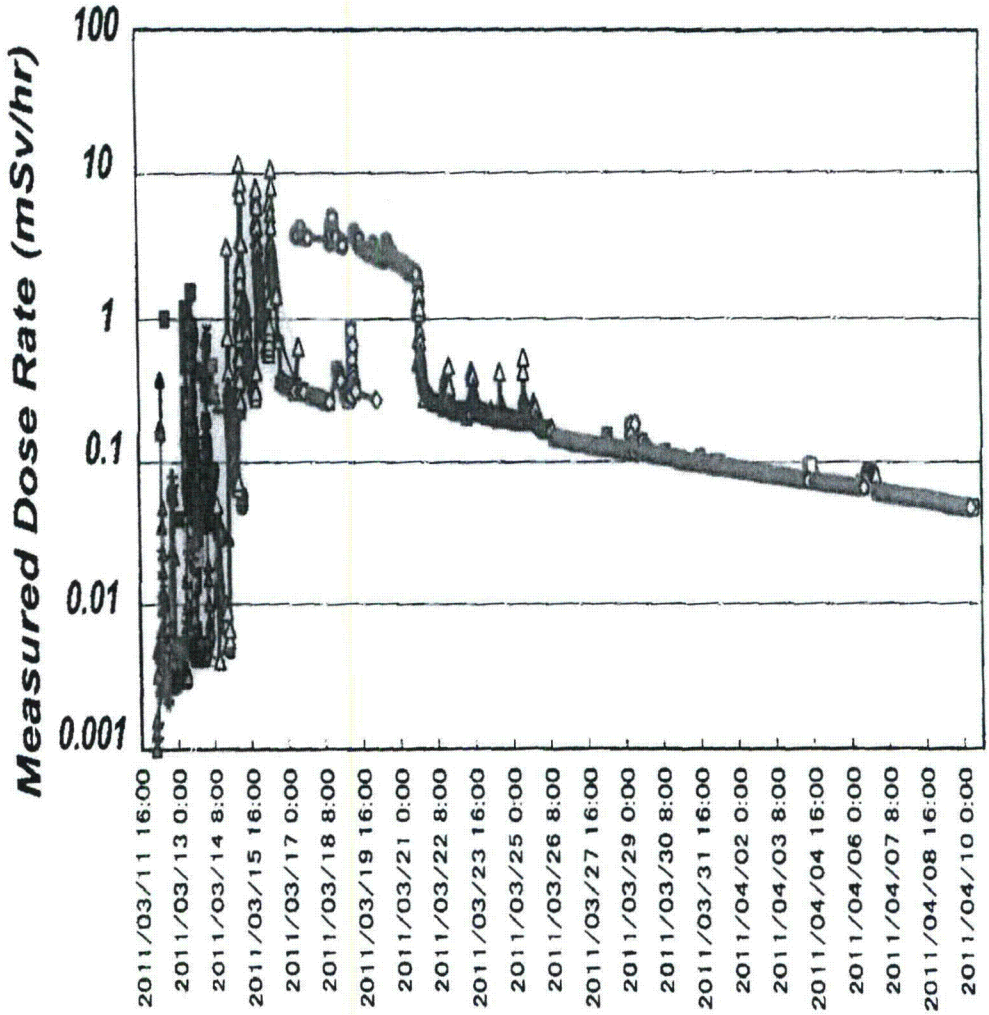
in the Fukushima Daiichi Nuclear Power Plants Site



On-site Radiation Monitoring in Fukushima Daiichi Site From March 11 to 18

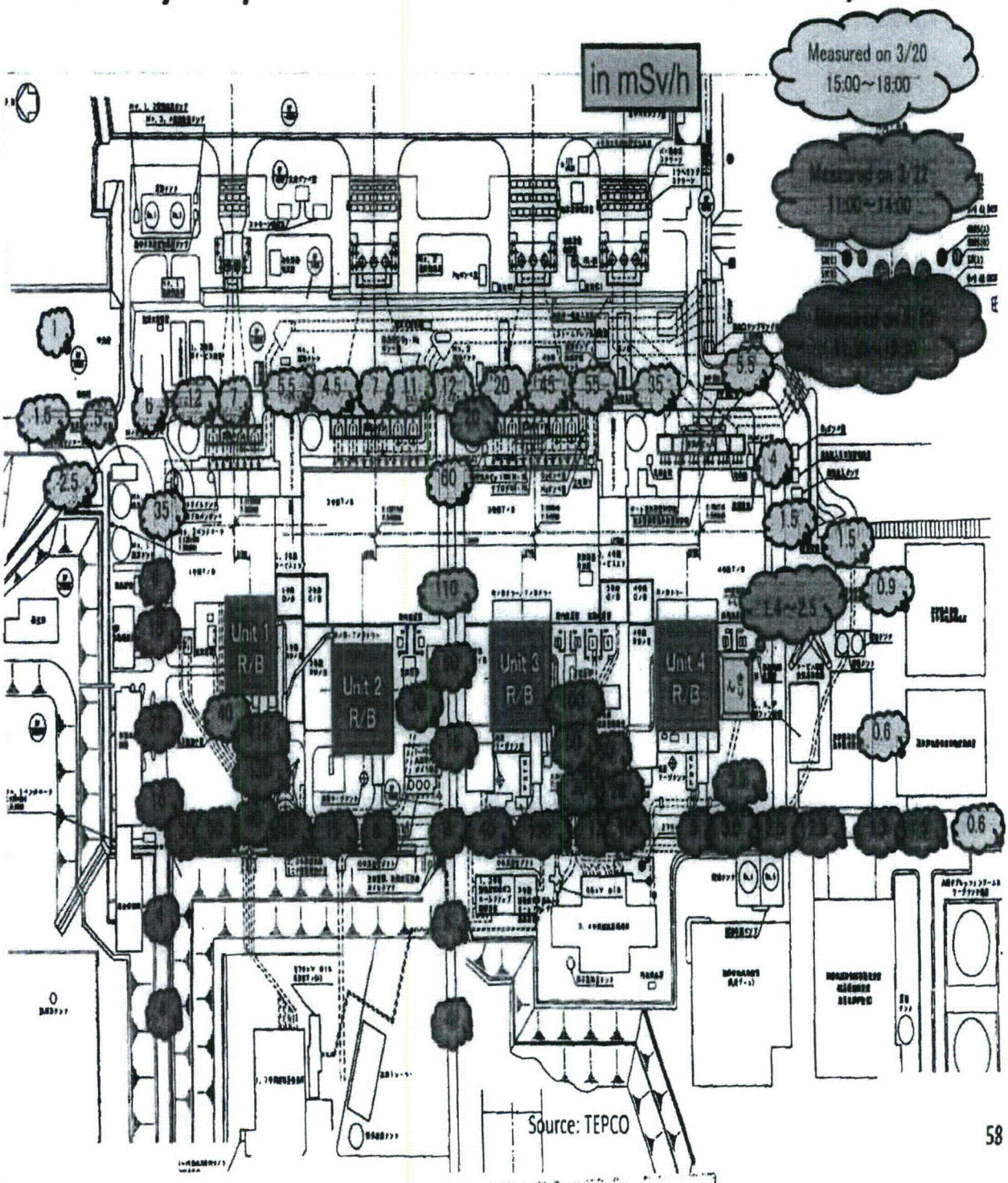


On-site Radiation Monitoring in Fukushima Daiichi Site From March 11 to April 10

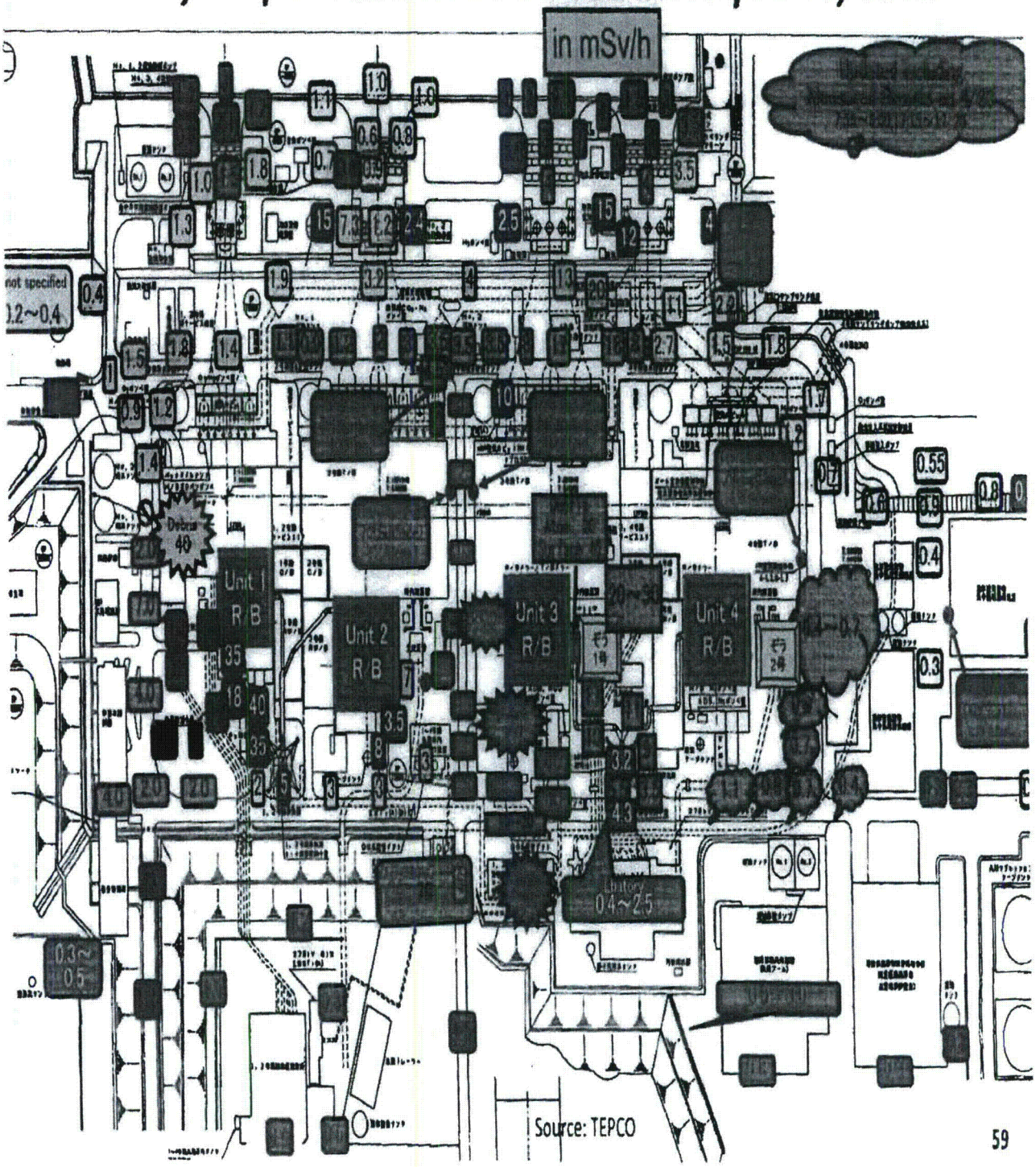


Source: NISA & TEPCO's press release

Survey Map in Fukushima Daiichi Site March 23, 2011

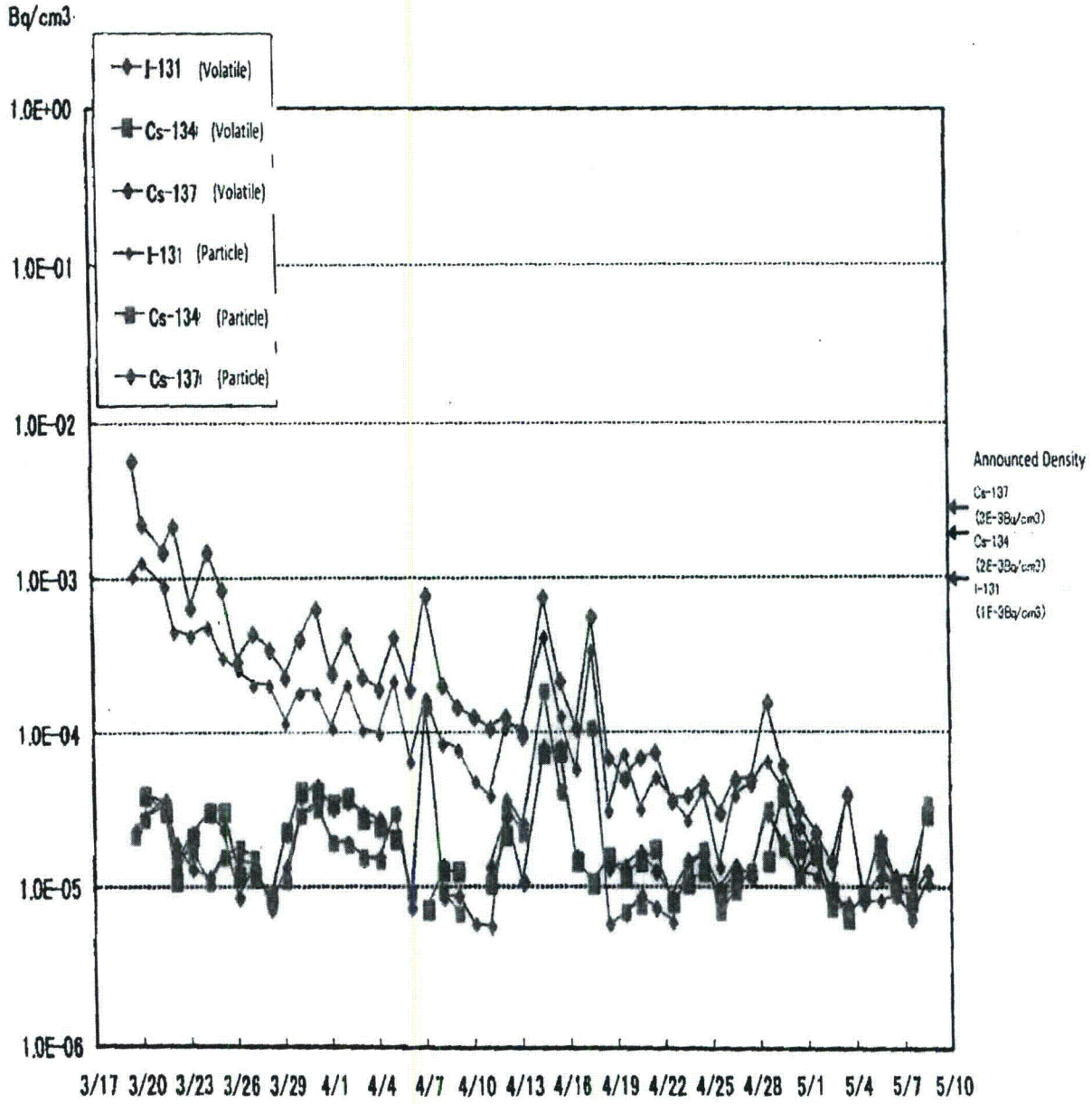


Survey Map in Fukushima Daiichi Site April 23, 2011



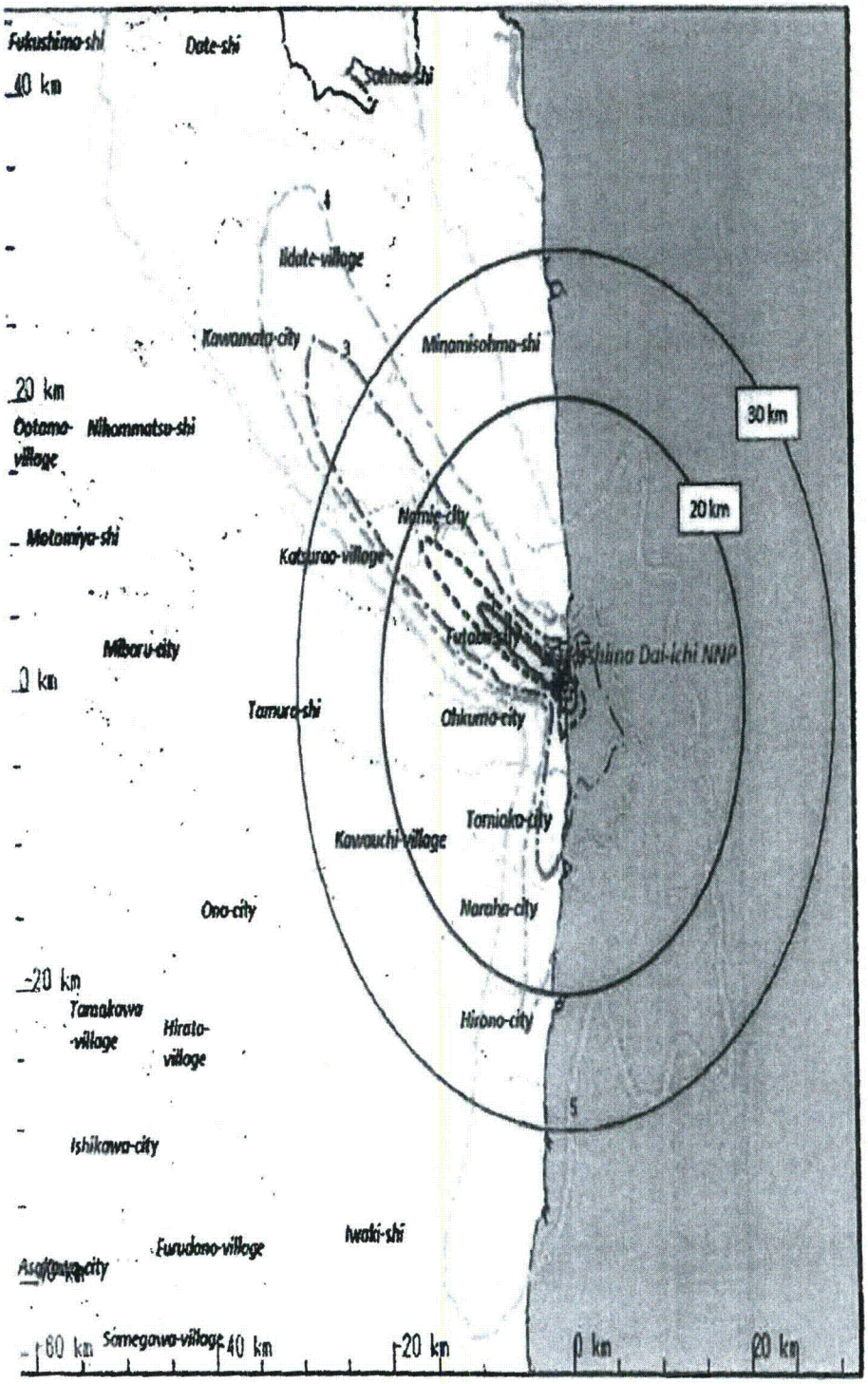
On-Site Monitoring of Radioactive Materials

Radioactive materials in the air measured by TEPCO



Source: TEPCO

Integrated Dose of External Exposure



SPEEDI code

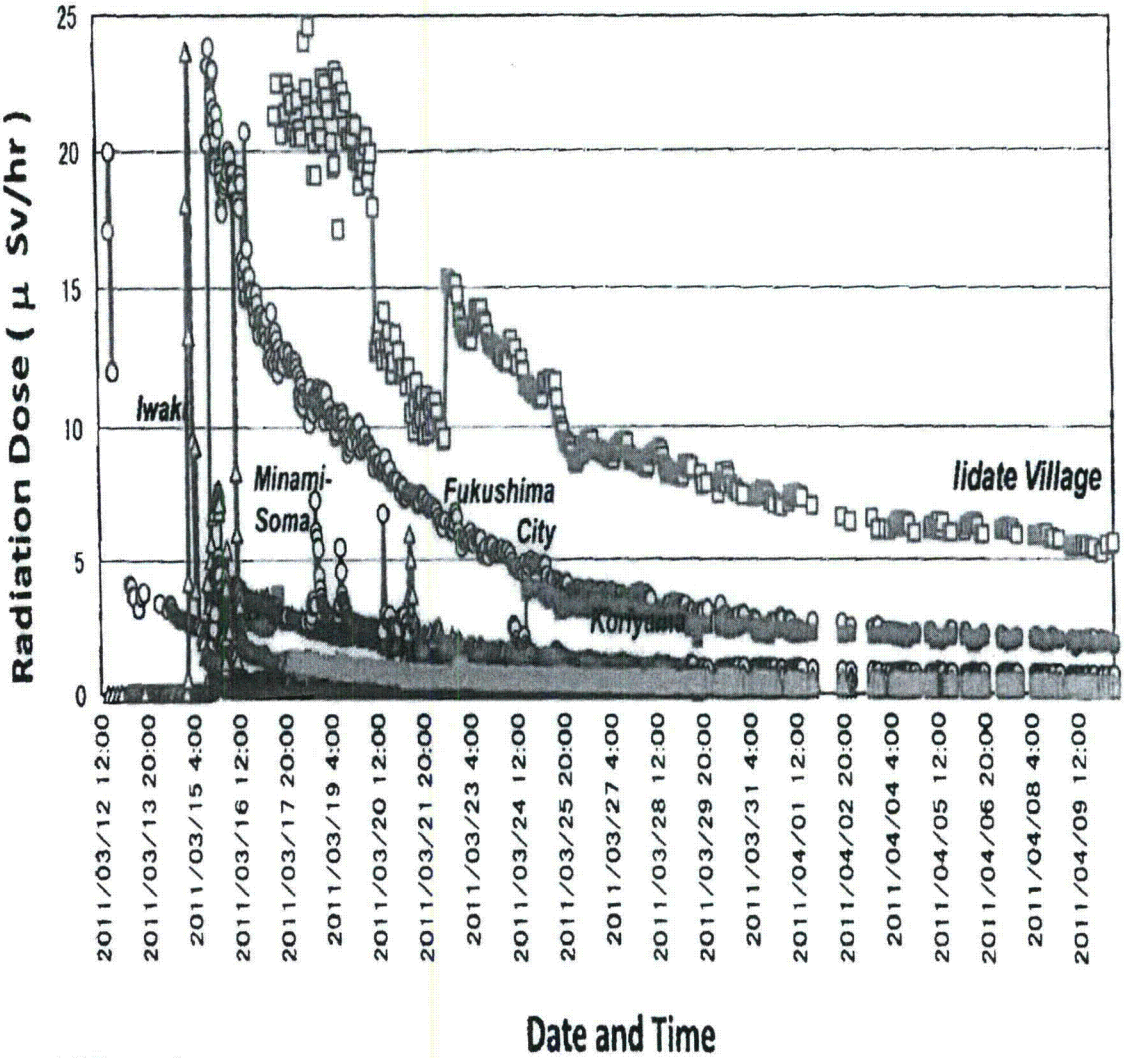
Adult

from March 12 to April 24, 2011

Effective Dose in mSv

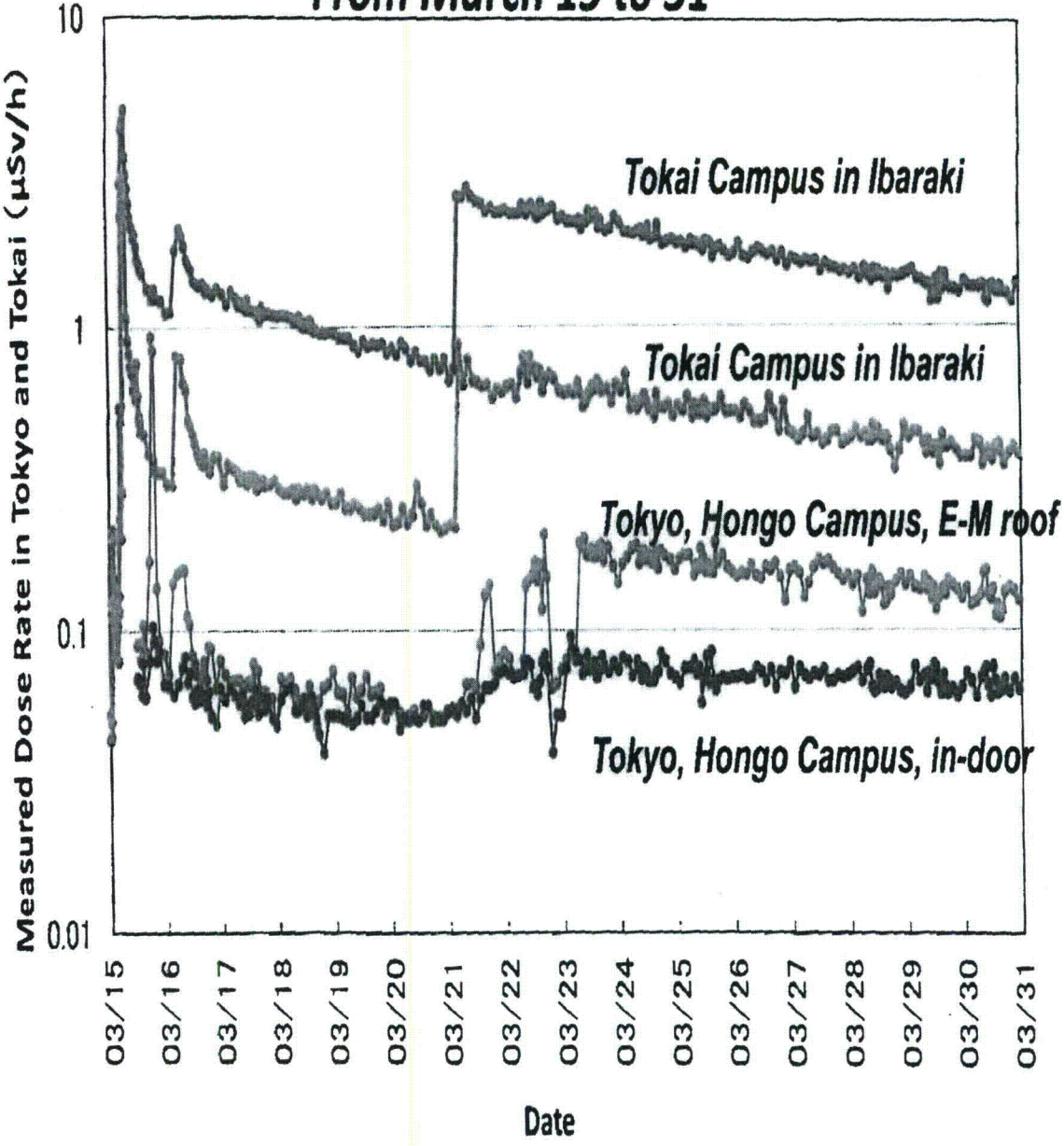
1: 100
2: 50
3: 10
4: 5
5: 1

Monitoring Radiation Dose in Fukushima Prefecture



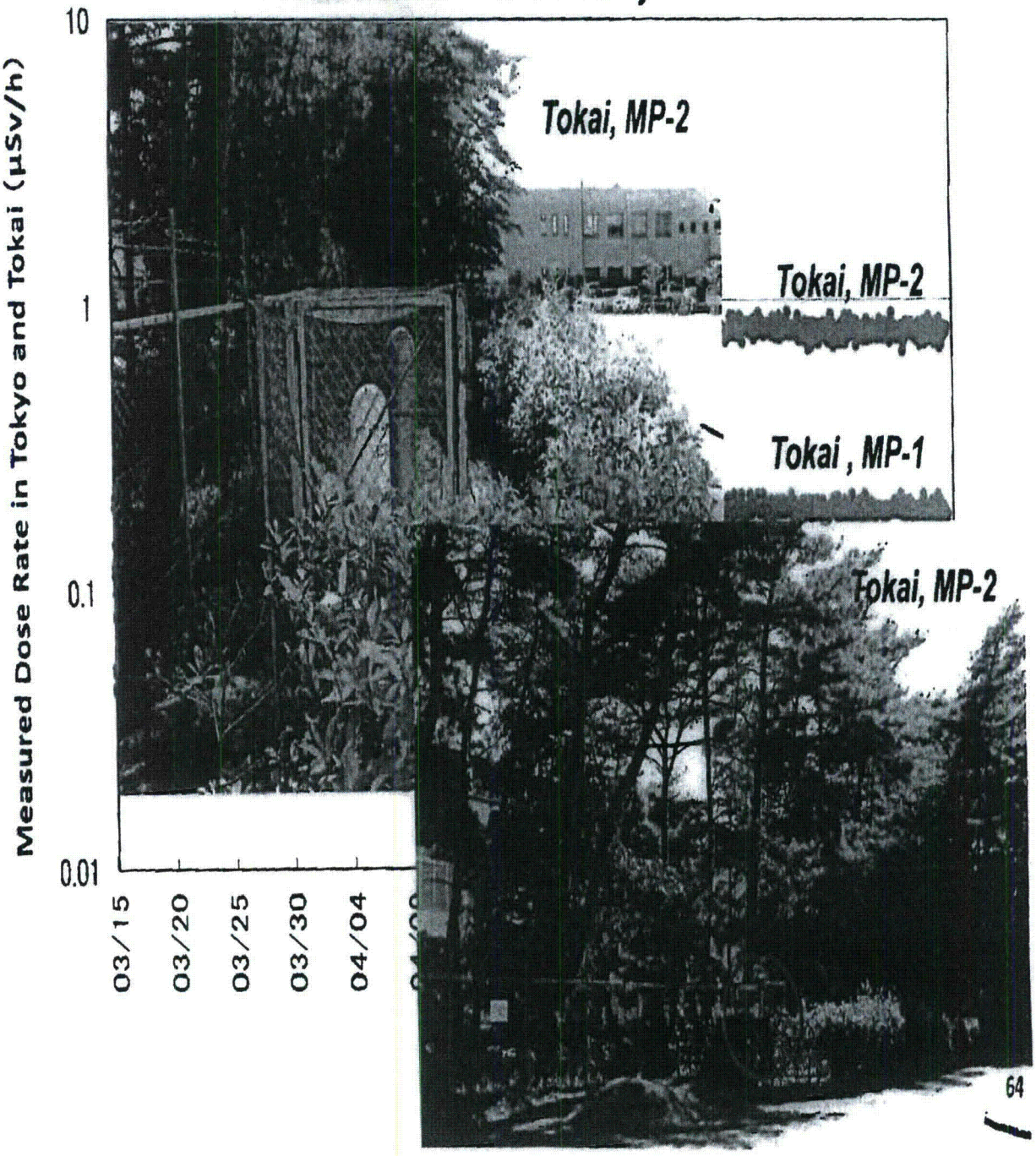
Source: MEXT press release

Radiation Monitoring at The University of Tokyo From March 15 to 31

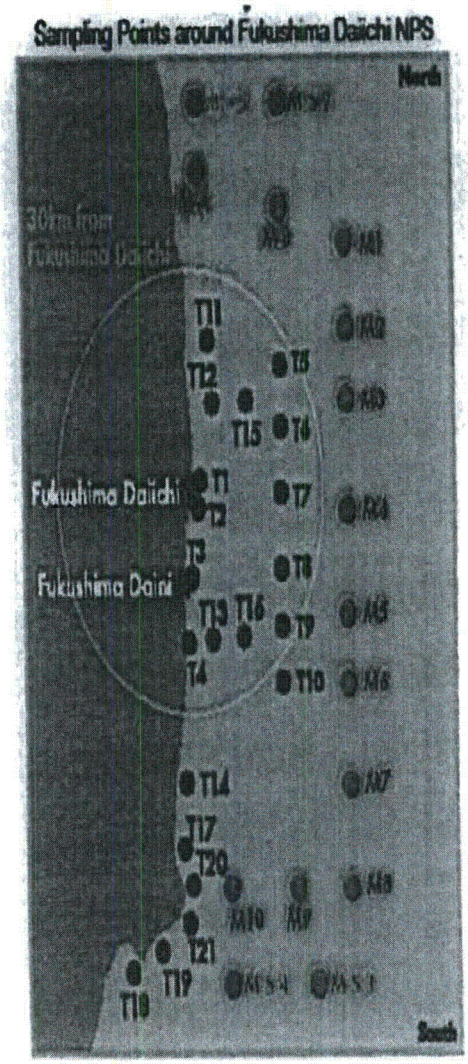


Distance from Fukushima Daiichi NPPs Ibaraki, Tokai Campus : 110 km
Tokyo, Hongo Campus : 230 km

Radiation Monitoring at The University of Tokyo From March 15 to May 24

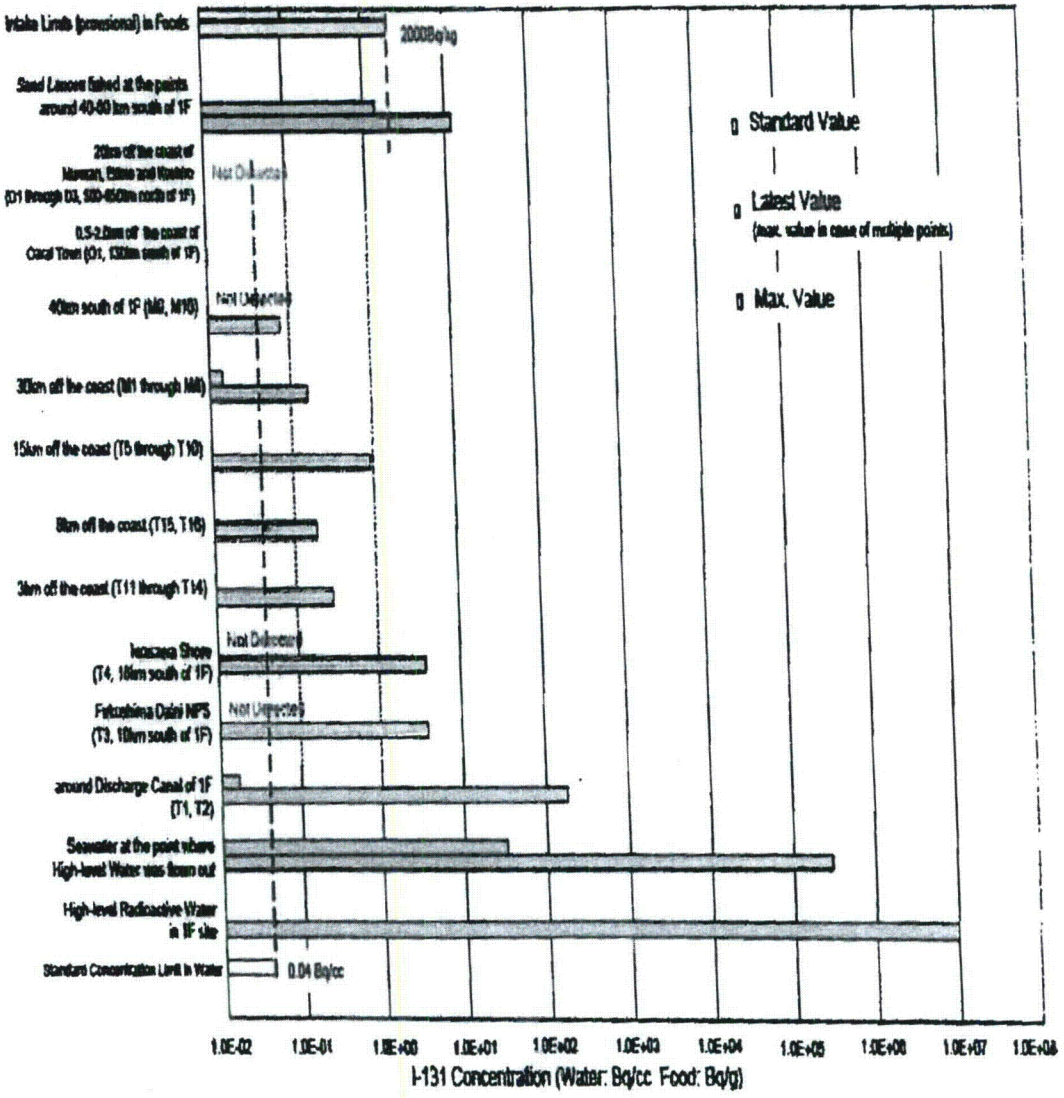


Monitoring of Radioactive Materials in Near-by Sea of Fukushima Daiichi NPPs

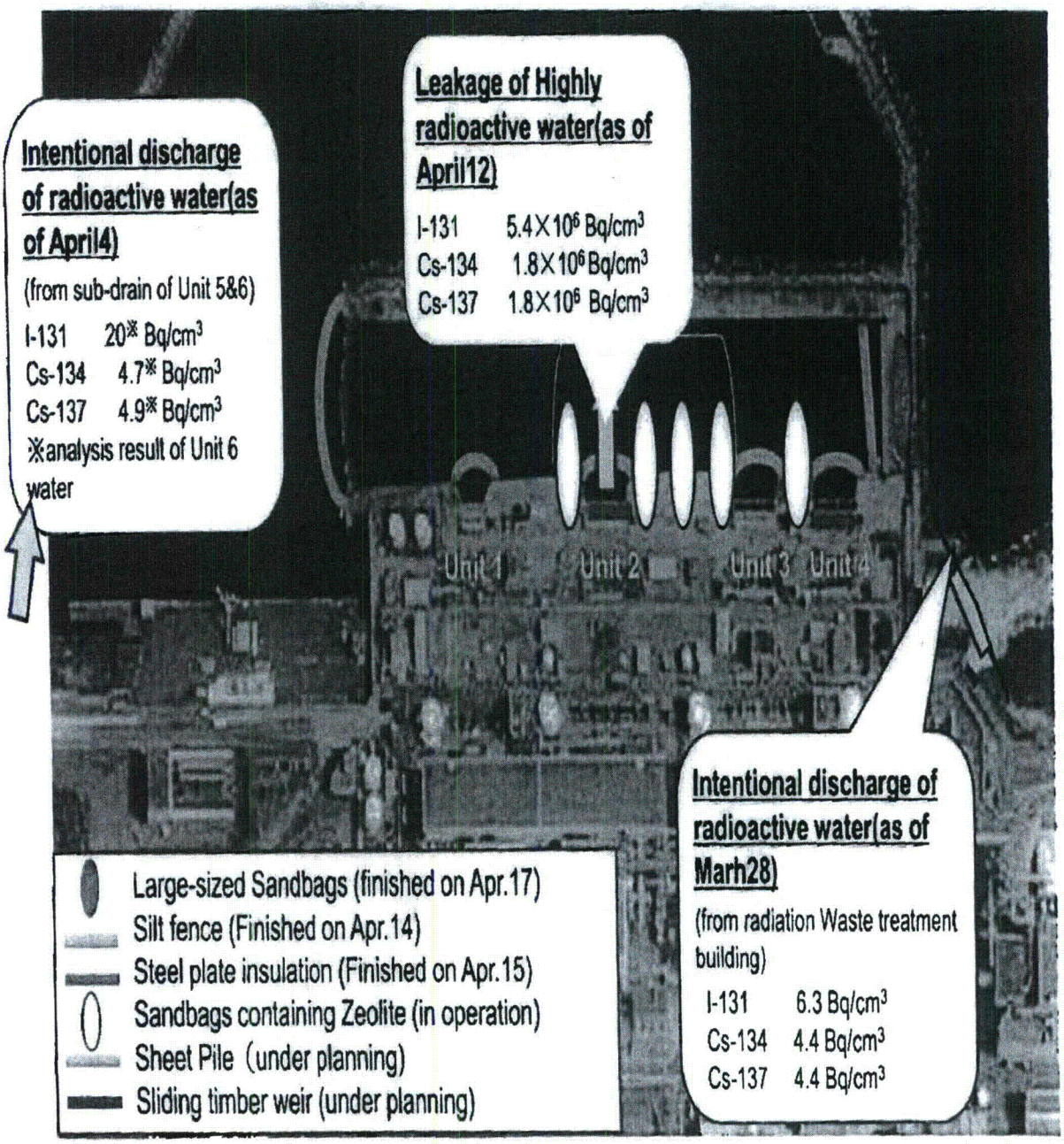


Monitoring of Radioactive Materials in Near-by Sea of Fukushima Daiichi NPPs

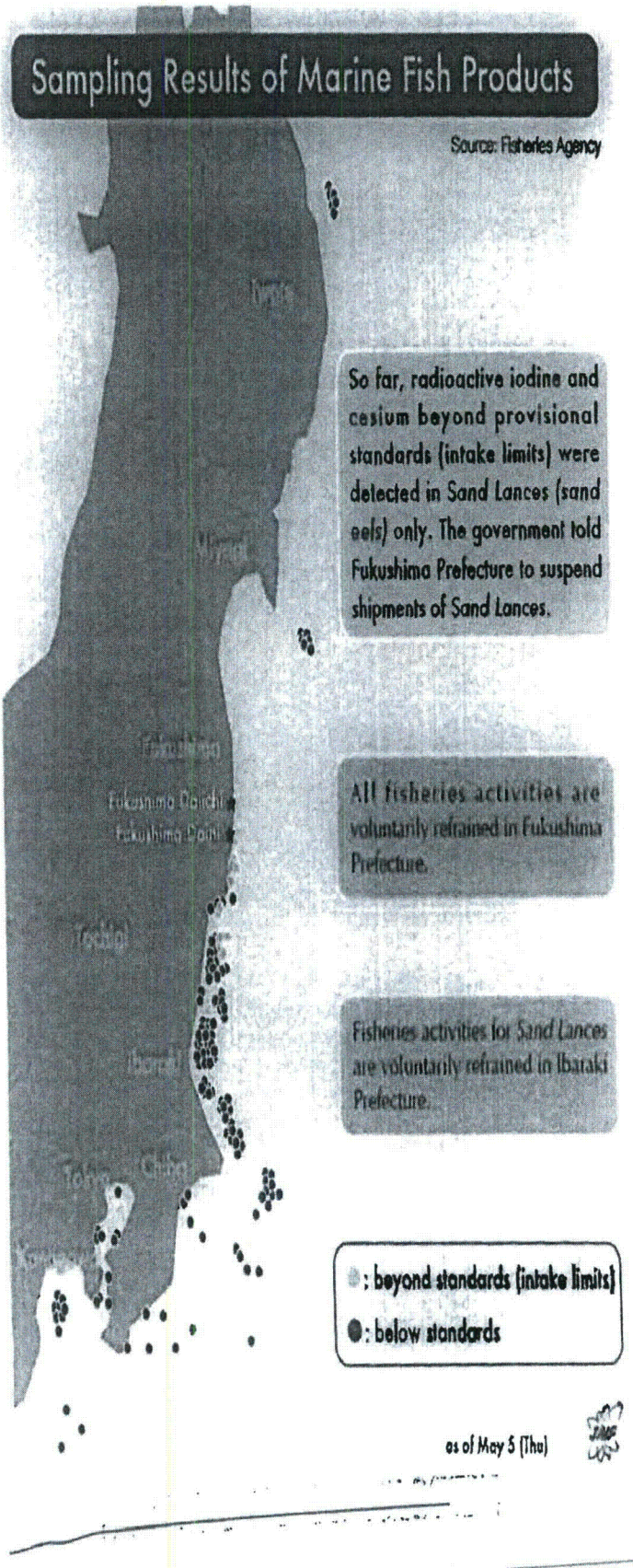
Concentration of Iodine 131 in Nearby Sea of Fukushima Daiichi (1F) NPS (up to May 5)



Measures to prevent the spread of radioactive water

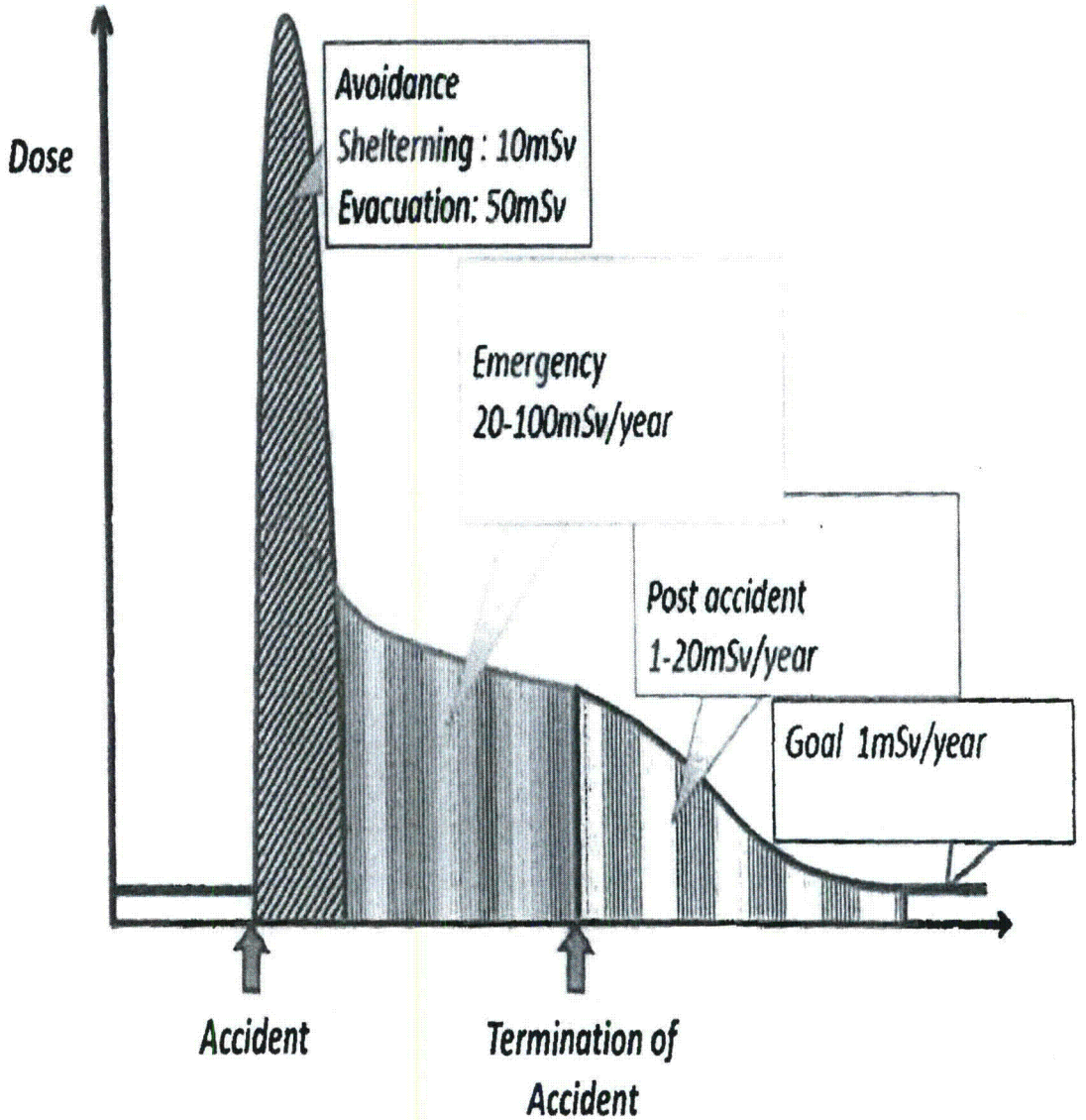


Source: TEPCO

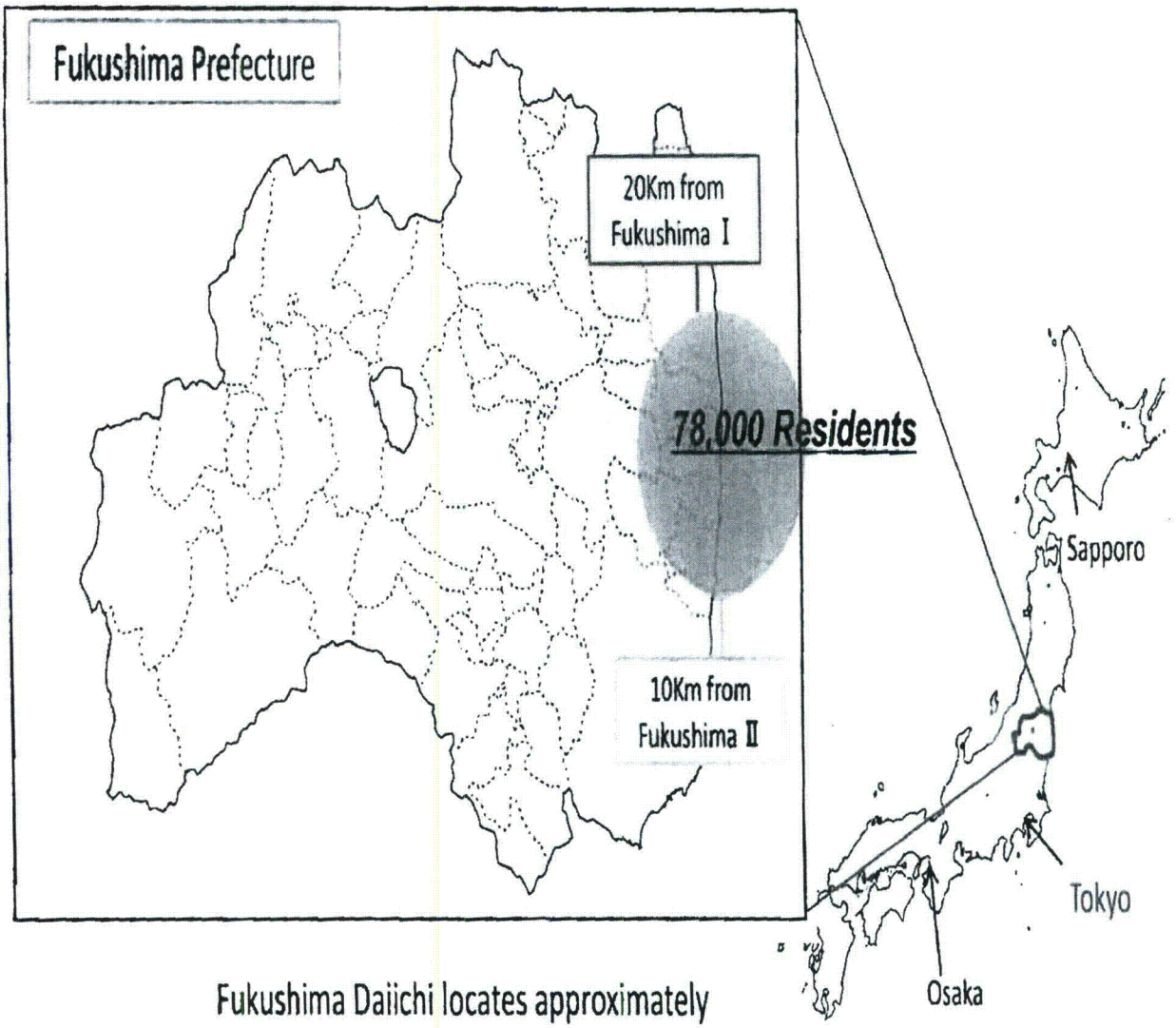

Sampling Results of Marine Fish Products
Source: Fisheries Agency
So far, radioactive iodine and cesium beyond provisional standards (intake limits) were detected in Sand Lances (sand eels) only. The government told Fukushima Prefecture to suspend shipments of Sand Lances.
All fisheries activities are voluntarily refrained in Fukushima Prefecture.
Fisheries activities for Sand Lances are voluntarily refrained in Ibaraki Prefecture.
: beyond standards (intake limits)
: below standards
as of May 5 (Thu)

Emergency Dose and Goals to Terminate the Accident

Nuclear Safety Commission on April, 12



Evacuation of Residents



Fukushima Daiichi locates approximately

- 230 km from Tokyo
- 580 km from Osaka
- 600 km from Sapporo

Evacuation of Residents

➢The government took measures such as taking shelters or evacuation as follows based on the reports from Fukushima Daiichi & Daini.

Fri, 11 March

14:46 The Earthquake

19:03 Emergency Declaration by the Gov't (Daiichi)

21:23 3 km radius evacuation (Daiichi)

10 km radius taking shelter (Daiichi)

Sat, 12 March

5:44 10 km radius evacuation (Daiichi)

7:45 3 km radius evacuation (Daini)

10 km radius taking shelter (Daini)

17:39 10 km radius evacuation (Daini)

18:25 20 km radius evacuation (Daiichi)

Tue, 15 March

11:00 20-30 km radius taking shelter (Daiichi)

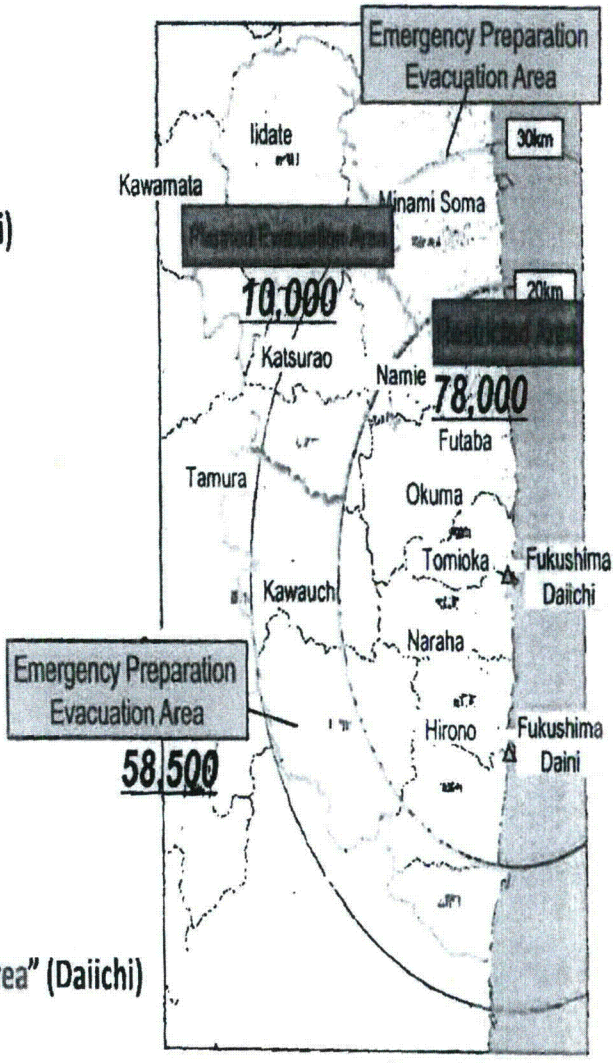
Thu, 21 April

11:00 20 km radius is designated as "Restricted Area" (Daiichi)

Fri, 22 April

9:44 20-30 km radius taking shelter has been lifted (Daiichi)

Establishment of "Planned Evacuation Area" and "Emergency Preparation Area"



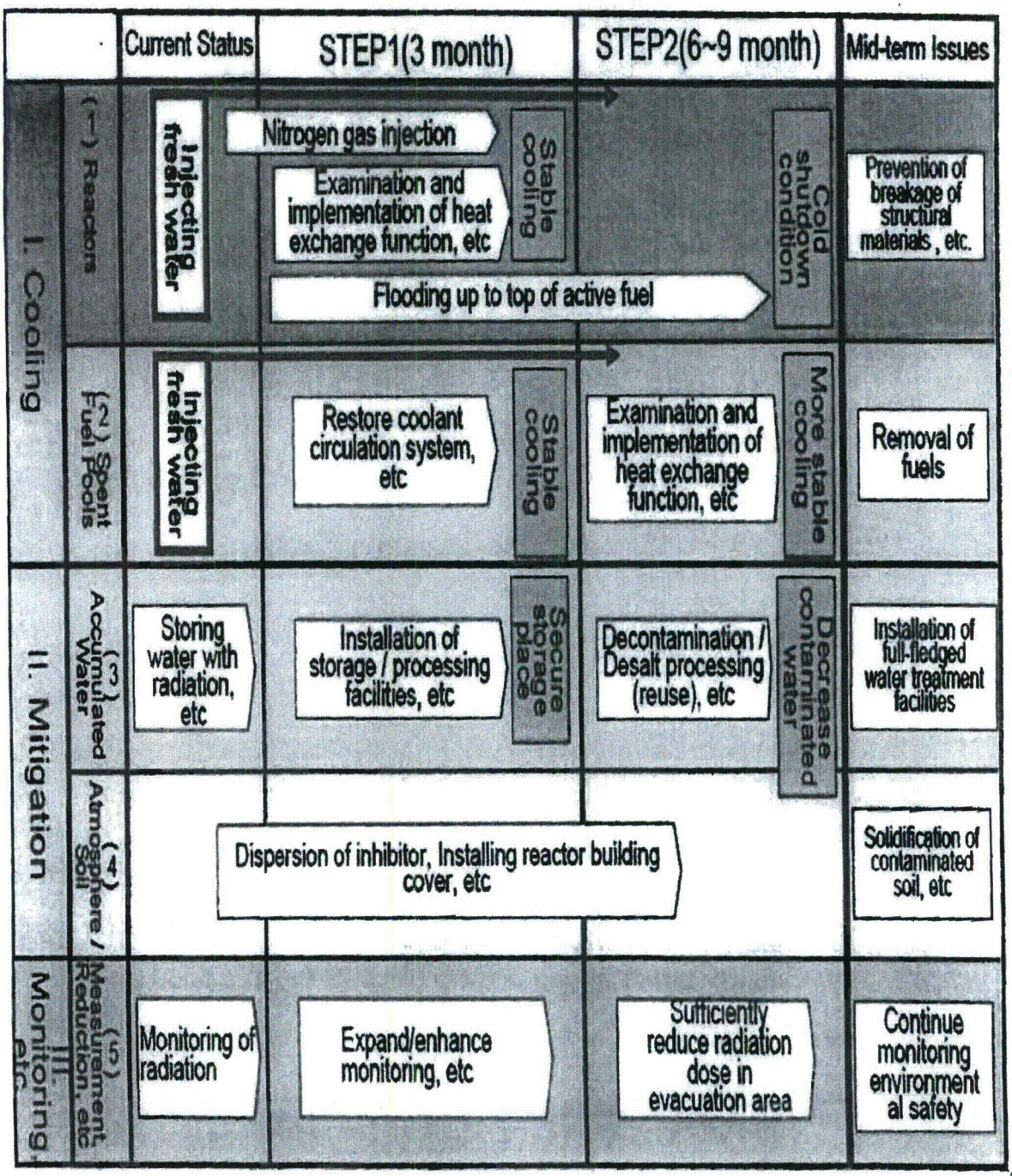
Source: NISA website

71

TEPCO's Roadmap on April 17

	Step 1 (About 3 months)	Step2 (Minimum about 6 to 9 Months)
Target	Steady Reduction of Radiation Dose	Controlling Radiation Release and Significant Reduction of Radiation Dose
Reactors	Stable Cooling (Water Filling over the Fuel)	Achieving the State of Cold Shutdown
Spent Fuel Pools	Stable Cooling	Keeping the Sufficient Water Level for More Stable Cooling (Remote Operation)
Radioactive Contaminated Water	Prevention of Outflow to the out of the Site	Processing and Decreasing the Contaminated Water
Radioactive Contaminated Atmosphere/Soil	Prevention of Spread	Covering Up the Entire Reactor Building

TEPCO's Roadmap on April 17



73

Government's response to TEPCO's proposal (Apr. 17)

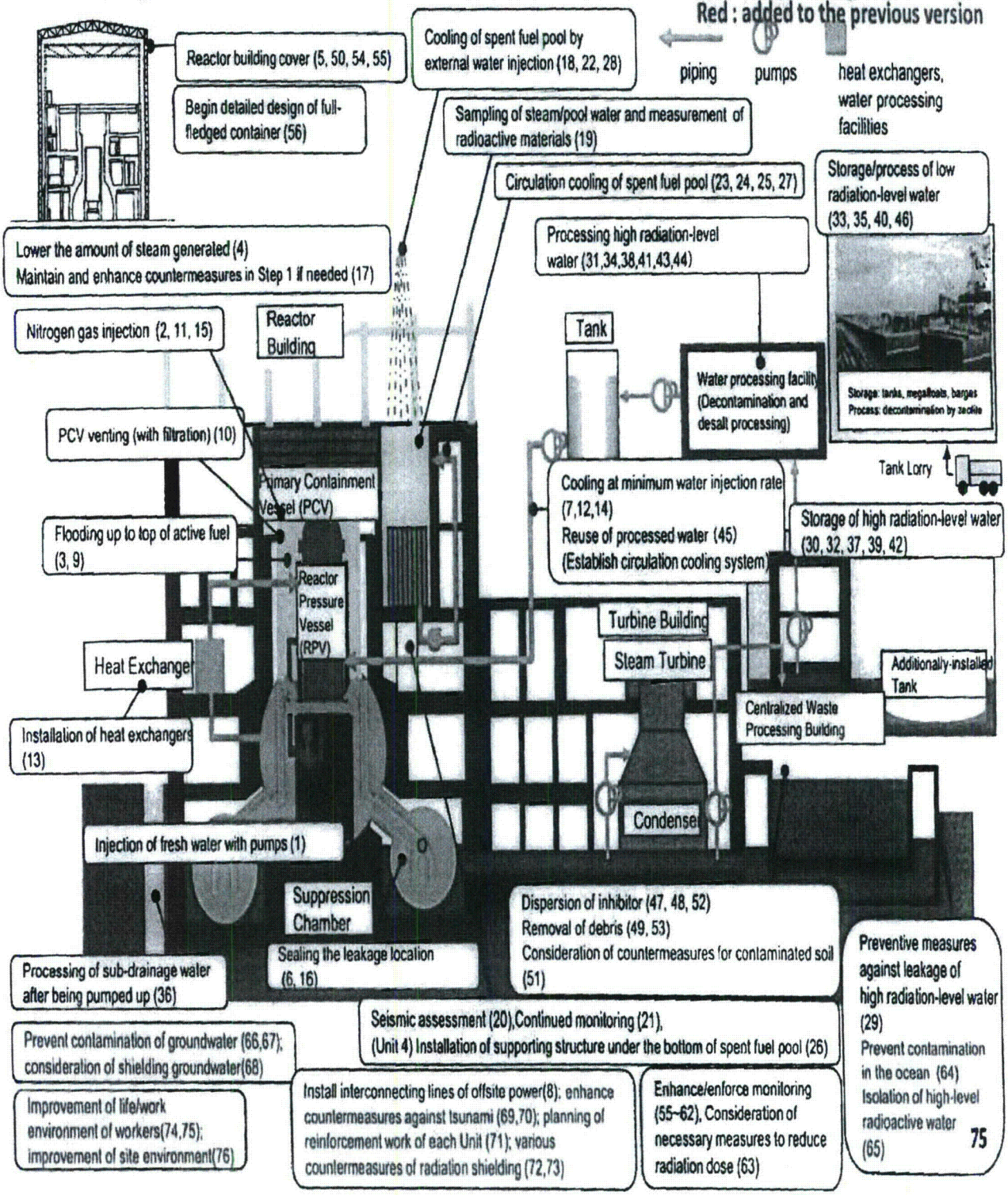
- The Government will request TEPCO to ensure the implementation of this roadmap steadily and as early as possible. To this end, the Nuclear and Industrial Safety Agency and others will make regular follow-up, monitoring of the progress of the works and necessary safety checks.

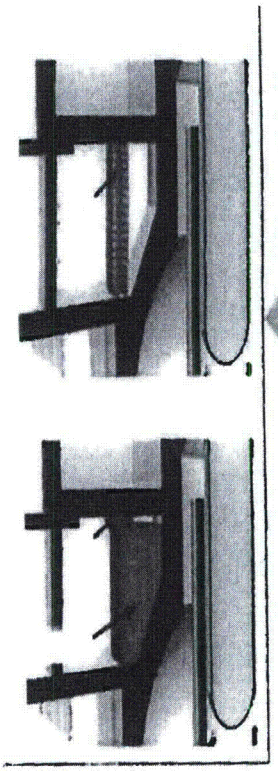
- The Government will request TEPCO to ensure the mobilization and deployment of workers, the procurement and preparation of equipment and materials, and the arrangement of accommodation and other facilities, which are necessary to ensure implementation of the roadmap

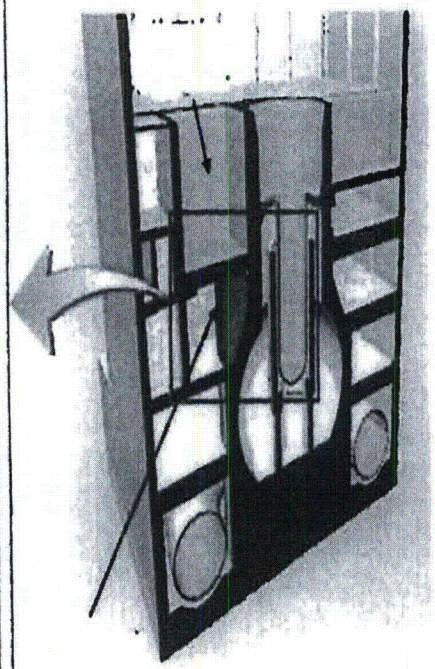
- At the end of Step2, the release of radioactive materials will be under control. At this stage, the government will review the Evacuation Area and the Evacuation Prepared Area. Up until that time, we will consider the details of review criteria, and will decontaminate the widest possible area.

Source: Nuclear and Industrial Safety Agency

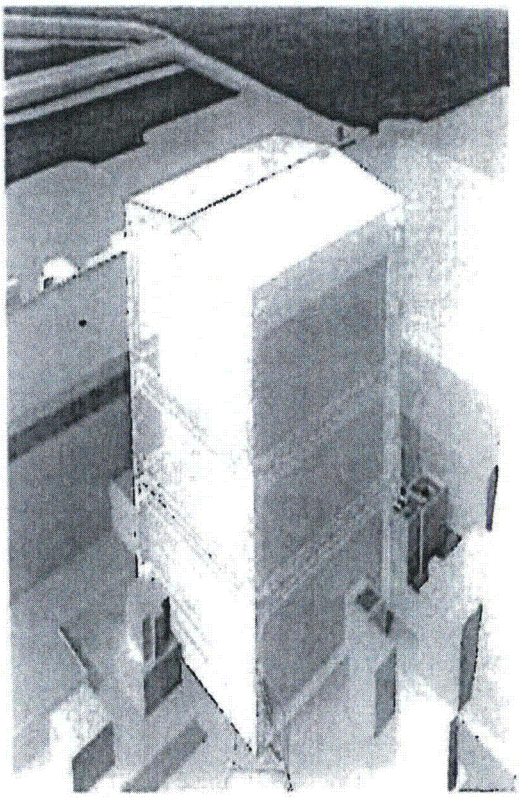
Major Countermeasures in the Power Station as of May 17



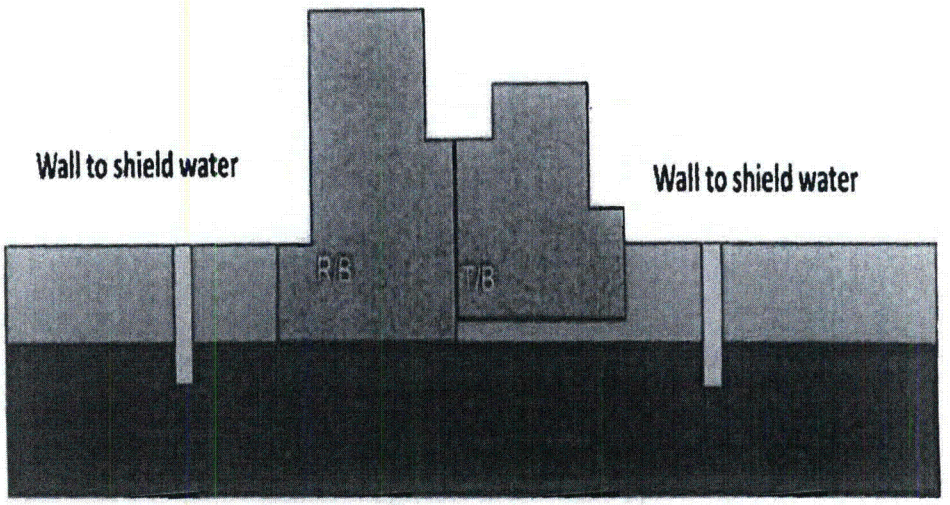




Installing Supporting Structure for SFP in Unit 4



Install of Reactor Building Cover for Unit 1



Measure to shield groundwater

Source: TEPCO

Conclusion : Preliminary Lessons Learned

The importance of Defense in Depth has been recognized with this accident

(1) Appropriate DBAs

Appropriate consideration for natural hazards by design

- Design basis tsunami height 5.7m against 15m of actual tsunami height

(2) Robustness and diversity in responding to beyond DBAs such as station black-out for long-duration, loss of ultimate heat sink

① Appropriate design philosophy to sustain safety function against common cause failures brought by natural hazards

- ***All the emergency DGs, except 1 air-cooled DG, were water-cooled and all were located in the basement of T/Bs***
- ***All the sea-water pumps were located slightly above the design tsunami height and they were with no protection against water.***

② Appropriate AM measures for both prevention and mitigation of SAs

- ***No AMs for SFP cooling and Hydrogen gas control in the R/Bs***
- ***No AMs training under severe conditions for multi-units under continuous aftershocks***

Conclusion : Preliminary Lessons Learned

(3) Difficult situations for post severe accident recovery

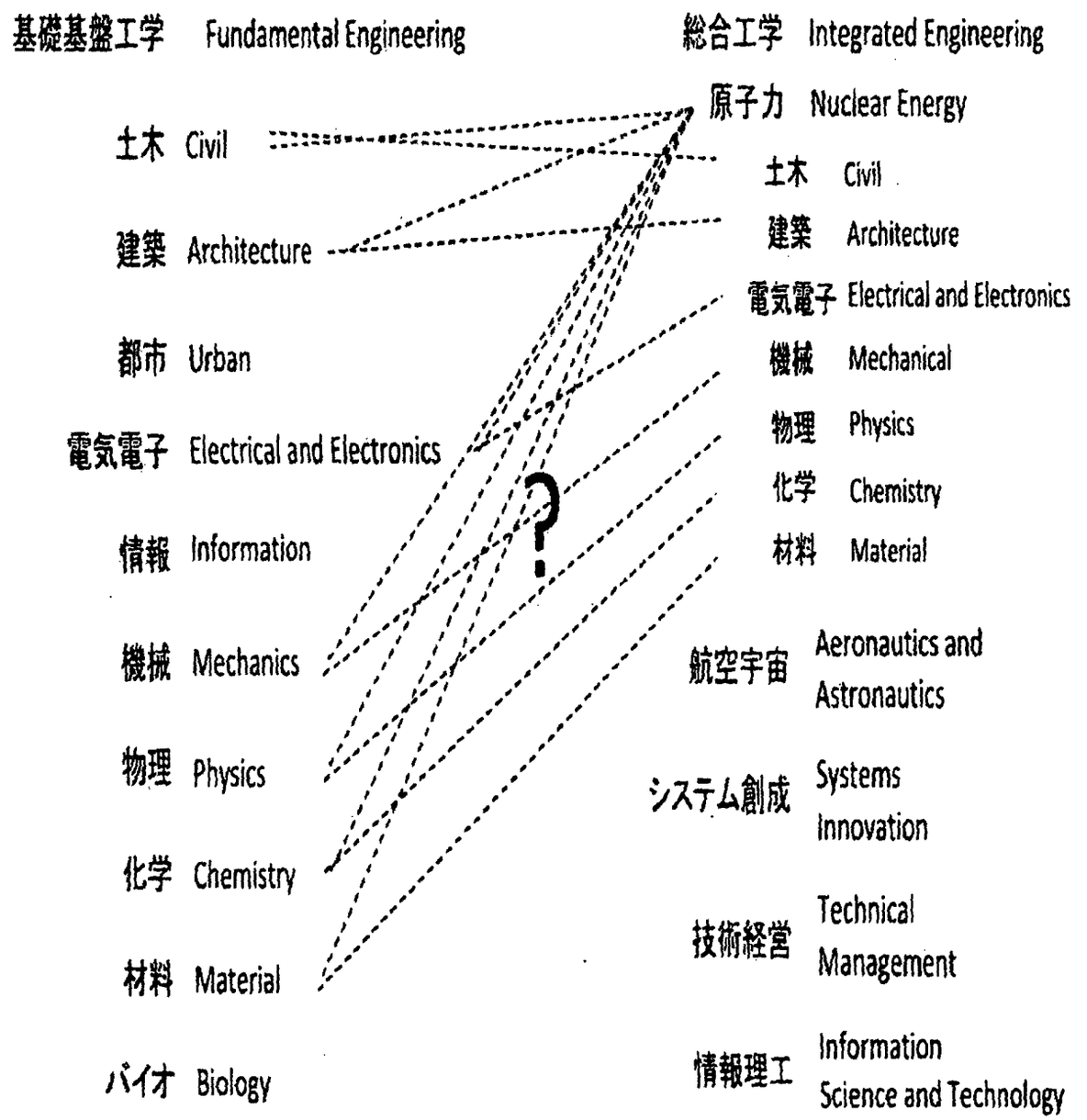
- *Warning for aftershocks and subsequent Tsunami*
- *High radiation in the working area*
- *Massive radioactive debris within the site*

(4) Emergency Preparedness and responses

- *Evacuation zones*
- *Function of off-site center*
- *Communication*
- *Radiation monitoring*

工学の在り方

Integrated Engineering for Huge Complicated Systems



Prof. T. Kitamori, Dean of School of Engineering, The University of Tokyo

Sharkey, Jeffry

From: Atlantic Council of the United States [energy@acus.org]
Sent: Friday, May 27, 2011 12:40 PM
To: Sharkey, Jeffry
Subject: Reminder: Atlantic Council Invitation: After Fukushima: The Future of Nuclear Energy in the United States and Europe, May 31

The Center for Transatlantic Relations (CTR)
at the Paul H. Nitze School of Advanced International Studies
Johns Hopkins University
EU Center of Excellence Washington DC
and
The Atlantic Council of the United States

invite you to a conference

AFTER FUKUSHIMA:
The Future of Nuclear Energy in the United States and Europe

Tuesday May 31, 2011

RSVP at:
energy@acus.org

Kenney Auditorium
Johns Hopkins University, Paul H.Nitze School of Advanced International Studies
1740 Massachusetts Ave, NW
Washington, D.C. 20036

8.30 - 8.45 **Registration and Coffee**

8.45 **Welcome and Opening Remarks**

Kurt Volker, Managing Director, Johns Hopkins SAIS, Center for Transatlantic Relations

Gen. Richard L. Lawson, Vice Chairman of the Atlantic Council

9.00 **The Outlook for Nuclear Power in the United States and Europe after Fukushima**

Keynote speeches by:

Daniel Poneman, Deputy Secretary, U.S. Department of Energy

João Vale de Almeida, Ambassador, Delegation of the European Union

Francois Delattre, Ambassador, Embassy of France

Klaus Scharioth, Ambassador, Embassy of Germany

10.15 **Political and Economic Realities of the Nuclear Renaissance in the U.S. and Europe**

Moderator: Kurt Volker, Managing Director, Johns Hopkins SAIS, Center for Transatlantic Relations

Wilfrid Kohl, Professor, Johns Hopkins SAIS, Energy Resources and Environment Program

Pekka Lintu, Ambassador Embassy of Finland

Zygimantas Pavilionis, Ambassador, Embassy of Lithuania

Daniel Kostoval, Chargé d'Affaires, Embassy of the Czech Republic

Maciej Pisarski, Chargé d'Affaires a.i., Embassy of Poland

Embassy of the United Kingdom

12.00 **Networking Lunch**

1.00 **Challenges and Solutions – Technology, Emergency Preparedness, Waste Management, Reactor Safety, and Financing**

Moderator: David Jhirad, Director, Energy, Resources and Environment Program at Johns Hopkins SAIS

Emergency Preparedness: Martin Virgilio, Deputy Executive Director for Reactor and Preparedness Programs, United States Nuclear Regulatory Commission

Waste Management: Allison M. Macfarlane, Associate Professor, George Mason University and Member, Blue Ribbon COmmission on America's Nuclear Future

Reactor Safety: James O. Ellis Jr. President and Chief Executive Officer Institute of Nuclear Power Operations

Financing: Mit Buchanan, Managing Director, JPMorgan Capital Corporation (invited)

3.00 Coffee Break

3.15 **Industry Perspectives on the Future of Nuclear Power in the United States and Europe and Addressing Public Concerns**

Moderator: Blythe J. Lyons, Nonresident Senior Fellow, Energy and Environment Program, Atlantic Council

Marvin Fertel, President & CEO, Nuclear Energy Institute

Finis Southworth, Chief Technology Officer, AREVA Inc.

Randolph D. Galm, Vice President Americas Marketing and Project Development, Westinghouse Electric Company

Ruth Smith, Senior Vice President, Global Government Relations, GE Hitachi Nuclear Energy

Representative, Southern Company (invited)

4.45 **Concluding Remarks**

Kurt Volker, Managing Director, Johns Hopkins SAIS, Center for Transatlantic Relations

Gen. Richard L. Lawson, Vice Chairman of the Atlantic Council

5.00 **Meeting Adjourns**

Castleman, Patrick

From: Castleman, Patrick
Sent: Wednesday, June 01, 2011 2:59 PM
To: Sharkey, Jeffry
Subject: RE: IAEA Investigation: Fukushima Preliminary Summary

My favorite passages:

The response on the site by dedicated, determined and expert staff, under extremely arduous conditions has been exemplary and resulted in the best approach to securing safety given the exceptional circumstances.

To date no health effects have been reported in any person as a result of radiation exposure from the nuclear accident.

The Japanese Government's longer term response to protect the public, including evacuation, has been impressive and extremely well organized.

The tsunami hazard for several sites was underestimated.

Let's see, next week GBJ is part of the NEA press conference, huh? Mike Weightman (who led the IAEA team, if my memory is correct) is part of that event as well. I wonder how GBJ will defend his actions and positions in light of the above findings?

From: Sharkey, Jeffry
Sent: Wednesday, June 01, 2011 2:47 PM
To: Castleman, Patrick
Subject: FW: IAEA Investigation: Fukushima Preliminary Summary

---

From: Breskovic, Clarence
Sent: Wednesday, June 01, 2011 2:45:54 PM
To: Breskovic, Clarence
Subject: IAEA Investigation: Fukushima Preliminary Summary
Auto forwarded by a Rule

Please see attached file

711

Castleman, Patrick ~~NOT FOR PUBLIC DISCLOSURE~~

From: Castleman, Patrick
Sent: Wednesday, June 01, 2011 3:01 PM
To: Orders, William; Gilles, Nanette; Franovich, Mike
Subject: FW: IAEA Investigation: Fukushima Preliminary Summary
Attachments: missionsummary010611.pdf

My favorite passages:

The response on the site by dedicated, determined and expert staff, under extremely arduous conditions has been exemplary and resulted in the best approach to securing safety given the exceptional circumstances.

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Auto forwarded by a Rule

Please see attached file

~~NOT FOR PUBLIC DISCLOSURE~~

712

Castleman, Patrick ~~NOT FOR PUBLIC DISCLOSURE~~

From: Hackett, Edwin
Sent: Wednesday, June 01, 2011 4:08 PM
To: Castleman, Patrick
Subject: RE: IAEA Investigation: Fukushima Preliminary Summary

Thanks Pat!

From: Castleman, Patrick
Sent: Wednesday, June 01, 2011 3:56 PM
To: Hackett, Edwin
Subject: FW: IAEA Investigation: Fukushima Preliminary Summary

From: Sharkey, Jeffry
Sent: Wednesday, June 01, 2011 2:47 PM
To: Castleman, Patrick
Subject: FW: IAEA Investigation: Fukushima Preliminary Summary

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From: Breskovic, Clarence
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To: Breskovic, Clarence
Subject: IAEA Investigation: Fukushima Preliminary Summary
Auto forwarded by a Rule

Please see attached file

713

~~NOT FOR PUBLIC DISCLOSURE~~

Sharkey, Jeffry

From: Doane, Margaret
Sent: Thursday, June 02, 2011 11:02 AM
To: Batkin, Joshua; Sharkey, Jeffry; Nieh, Ho; Bubar, Patrice; Sosa, Belkys
Cc: Emche, Danielle; Ramsey, Jack; Abrams, Charlotte; Bloom, Steven; Mamish, Nader; Borchardt, Bill; Weber, Michael; Virgilio, Martin; Skeen, David
Subject: RE: No Confidence Vote in Japan

Hello EAs,
This note is for information only, no action is requested. The Japanese Prime Minister Naoto Kan survived a no-confidence vote 293-152 yesterday. A "no-confidence" motion is a formal procedure used by the Parliament to hold a vote on whether it continues to have confidence in the Government. Usually, if a no-confidence motion is successful, the head of state would have to respond and it would typically mean that the fall of the Government. The basis for the no-confidence motion was opposition views to his handling of the March 11 earthquake, tsunami and the ensuing nuclear crises. Prior to the vote in the lower house, PM Kan stated that if still in office, he would continue to push ahead with measures to bring the country back from the crises and that once Japan was on a track for recovery he would step down as Prime Minister. He did not specify a date that he would step down, or the criteria to determine when the country was on the road to recovery.

See below for articles from CNN and USAToday on the subject.

Margie

****

Tokyo (CNN) -- Japanese Prime Minister Naoto Kan survived a no-confidence vote in parliament on Thursday.
The final tally was 293 against the motion and 152 for it.
The opposition Liberal Democratic Party filed the no-confidence motion Wednesday, and needed a simple majority for it to pass in parliament, and fell far short of that number. It cited his handling of the March 11 earthquake, tsunami and ensuing nuclear crisis as a reason for the motion.
Had the motion passed, Kan would have been required to step down within 10 days or dissolve the lower house of parliament and force a snap election.
A devastating tsunami struck Japan's Pacific coast after the massive earthquake in March, triggering the worst nuclear accident since Chernobyl as the cores of reactors at the Fukushima Daiichi nuclear plant overheated and spewed radioactive chemicals.
Kan, who was unpopular before the disaster, has come under fire as the nation battles to contain the nuclear and economic woes. Adding on to the problems, ratings agency Moody's Investors Service placed the country's local and foreign currency bond ratings on review for possible downgrade.
Political in-fighting remains a problem in Japan, which has seen six prime ministers in the past five years.
Last year, after only a few months in office, his main political opponent within his own party attempted to take control of the Democratic Party of Japan, effectively taking over the premiership. Kan managed to hold onto the title of party leader.
Kan's one-year anniversary in office is June 8.

TOKYO — Prime Minister Naoto Kan survived a no-confidence motion Thursday over his response Japan's massive tsunami and ensuing nuclear crisis, but said he is willing to resign once the country's recovery takes hold.

AP

Japan's Prime Minister Naoto Kan in Tokyo

AP

Kan won by a margin of 293-152 in the 480-seat lower house. The remaining members were absent or abstained from the vote.

Before the session, Kan urged lawmakers to let him stay on and push ahead with measures to bring the country through the crisis caused by the March 11 earthquake and tsunami that left more than 24,000 people dead or missing and crippled a nuclear power plant northeast of Tokyo. He said he would consider resigning after they firm up.

Kan did not specify a date for when he might step down or say how he would determine that the recovery was on track. Opponents immediately slammed that, saying Japan cannot afford to have a lame duck administration.

Kan, in office just one year, has been criticized for not acting fast enough on the crisis, and for a perceived lack of leadership.

"Once the post-quake reconstruction efforts are settled, I will pass on my responsibility to younger generations," he said. "The nuclear crisis is ongoing, and I will make my utmost efforts to end the crisis and move forward with post-quake reconstruction works."

Japanese media reported Kan could stay on for a few months.

"I don't think it will be long," said Yukio Hatoyama, a ruling party member who preceded Kan as prime minister.

Kan, who became prime minister just a year ago, has been criticized for delays in construction of temporary housing for evacuees, and a lack of transparency about evacuation information. His government is also embroiled in a debate about compensation for victims.

The disaster — believed to be the costliest in history — has been a huge drain on Japan's already fragile economy.

Japan's government has said the cost of the earthquake and tsunami could reach $309 billion, making it the world's most expensive natural disaster on record, with extensive damage to housing, roads, utilities and businesses. Japan's ballooning debt is already twice the size of the country's gross domestic product.

On Wednesday, the largest opposition group, the Liberal Democratic Party, submitted the no-confidence motion along with two smaller opposition groups.

"We have reached the conclusion that having you step down by a no-confidence vote would be the only way to save our country from this crisis" senior LDP senior lawmaker Tadamori Oshima told Kan over a chorus of cheers and jeers in the parliament chamber.

Although his Democratic Party of Japan controls the lower house, where the no-confidence motion was submitted, dozens of ruling party lawmakers — including Hatoyama and another senior powerbroker — have expressed concern with his leadership, creating a deep rift.

The motion and the ruling party split have complicated Kan's efforts to unite the government behind his reconstruction plans, which involve a huge injection of funds and possibly tax increases.

March's magnitude 9.0 quake and the massive tsunami that followed damaged the Fukushima Dai-ichi nuclear plant, causing the worst nuclear crisis since Chernobyl in 1986. About 80,000 residents have been forced to evacuate towns contaminated by the radiation-leaking plant.

Kan's fortunes were sagging before the crisis began, but have plummeted since.

In the 1990s, Kan was a crusading health minister who stood up to his own bureaucracy to lift the lid on a horrific AIDS scandal, but he was seen as an uninspiring prime minister even before the earthquake with a popularity rating below 20 percent.

He emerged as prime minister last June only after other leaders of his Democratic Party resigned. He already is Japan's fifth leader in four years.

http://www.cnn.com/2011/WORLD/asiapcf/06/02/japan.prime.minister.vote/index.html

http://www.usatoday.com/news/world/2011-06-02-japan-politics-kan_n.htm

715

Castleman, Patrick

From: Svinicki, Kristine
Sent: Monday, June 06, 2011 12:32 PM
To: Sharkey, Jeffry; Reddick, Darani; Castleman, Patrick
Subject: FW: 11-097.docx
Attachments: 11-097.docx

Interesting stats, I guess, but none of these are actually regulatory requirements, are they?

The inspectors found that all plants have implemented the guidelines, with 97 percent of the plants keeping SAMG documents in their Technical Support Center, generally considered the best location for properly implementing the guidelines. The inspectors found SAMGs in 89 percent of plant control rooms, and in 71 percent of plant Emergency Operations Facilities. Only 42 percent of the plants, however, presently include SAMGs in their periodic review/revision procedures. The inspectors found that staff at 92 percent of the plants received initial training on SAMGs. When examining how the plants exercise carrying out SAMGs, the inspectors found only 61 percent of the plants periodically include the guidelines in their emergency drills.

From: OPA Resource
Sent: Monday, June 06, 2011 11:57 AM
To: Abbott, Coleman; Ash, Darren; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Bollwerk, Paul; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Cutler, Iris; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Hollan, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quayle, Lisa; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Steger (Tucci), Christine; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy; Zorn, Jason
Subject: 11-097.docx

Attached to be released in approximately one hour

716

Castleman, Patrick ~~NOT FOR PUBLIC DISCLOSURE~~

From: Skeen, David
Sent: Tuesday, June 07, 2011 10:39 AM
To: Orders, William; Franovich, Mike; Castleman, Patrick; Sharkey, Jeffry; Bubar, Patrice; Nieh, Ho; Sosa, Belkys; Marshall, Michael; Hipschman, Thomas; Batkin, Joshua
Cc: Taylor, Robert; Andersen, James
Subject: FYI - English translation of Japan Report to IAEA regarding Fukushima Accident

All,

Per our discussion on this morning's status call with the Commissioner Assistants, here is the link to the English translation of Japan's report submitted to the IAEA in advance of the upcoming ministerial meeting in Vienna, scheduled for June 20 – 24.

http://www.kantei.go.jp/foreign/kan/topics/201106/iaea_houkokusho_e.html

Please let me know if you have any trouble viewing the report.

Dave
x-3484

~~NOT FOR PUBLIC DISCLOSURE~~

Castleman, Patrick ~~NOT FOR PUBLIC DISCLOSURE~~

From: Castleman, Patrick
Sent: Tuesday, June 07, 2011 10:48 AM
To: Svinicki, Kristine
Cc: Sharkey, Jeffry; Thoma, John
Subject: FW: FYI - English translation of Japan Report to IAEA regarding Fukushima Accident

Commissioner,

FYI.

Pat

From: Skeen, David
Sent: Tuesday, June 07, 2011 10:39 AM
To: Orders, William; Franovich, Mike; Castleman, Patrick; Sharkey, Jeffry; Bubar, Patrice; Nieh, Ho; Sosa, Belkys; Marshall, Michael; Hipschman, Thomas; Batkin, Joshua
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Please let me know if you have any trouble viewing the report.

Dave
x-3484

Castleman, Patrick

From: Castleman, Patrick
Sent: Wednesday, June 08, 2011 4:28 PM
To: Lepre, Janet; Svinicki, Kristine
Cc: Sharkey, Jeffry; Reddick, Darani; Thoma, John
Subject: RE: Challenges and Response to Fukushima

Anbex is a KI distributor and has had multimillion dollar contracts with the NRC.

From: Lepre, Janet
Sent: Wednesday, June 08, 2011 4:10 PM
To: Svinicki, Kristine
Cc: Sharkey, Jeffry; Reddick, Darani; Castleman, Patrick; Thoma, John
Subject: FW: Challenges and Response to Fukushima

Incoming letter to the Chairman and cc to all Commissioners from Alan Morris, President, Anbex, Inc.

Jan

~~NOT FOR PUBLIC DISCLOSURE~~ 722

Svinicki, Kristine

From: Castleman, Patrick
Sent: Thursday, June 09, 2011 4:23 PM
To: Svinicki, Kristine
Cc: Sharkey, Jeffry; Reddick, Darani
Subject: RE: New NRC Daily Notes for June 9, 2011

Commissioner, Regarding the report referenced below, I am going through it and will extract appropriate portions for inclusion in your Commission meeting briefing book. The entire report is something like 380 pages long, and it is all web linked (not a pdf of a hardcopy). Please advise if you want me to take another approach. Pat

OEDO

~~(OUO-SH)~~

On June 7, the Government of Japan released its report entitled "Report of Japanese Government to the IAEA Ministerial Conference on Nuclear Safety - The Accident at TEPCO's Fukushima Nuclear Power Stations." This report summarizes the events at Fukushima Dai-ichi following the March 11th earthquake and tsunami and provides twenty-eight lessons-learned. NRC staff are reviewing the report to enhance our understanding of the sequence of events and to identify if any potential safety enhancements for U.S. nuclear power plants may be warranted. The report can be found at the following web address: http://www.kantei.go.jp/foreign/kan/topics/201106/iaea_houkokusho_e.html.

~~NOT FOR PUBLIC DISCLOSURE~~

Reddick, Darani ~~NOT FOR PUBLIC DISCLOSURE~~

From: Lepre, Janet
Sent: Thursday, June 09, 2011 10:13 AM
To: Svinicki, Kristine; Castleman, Patrick; Sharkey, Jeffry; Reddick, Darani; Thoma, John
Cc: Harves, Carolyn
Subject: FW: U.S. Industry Leadership in Response to the Fukushima Daiichi Nuclear Accidents
Attachments: U.S. Industry Leadership in Response to the Fukushima Daiichi Nuclear Accidents

Forwarding incoming to the Commission from Tony Pietrangelo re Fukushima.

Jan

Castleman, Patrick

From: Svinicki, Kristine
Sent: Monday, June 13, 2011 6:34 PM
To: Lepre, Janet; Castleman, Patrick
Subject: FW: FYI: Material from the OECD/NEA Forum on Fukushima
Attachments: Session_2_Hattori_Fukushima_accidentREV3.pdf; NEA Forum on Fukushima Programme final.pdf; Session 1 _Canada_Presentation_to_NEA_Forum_on_the_Fukushima_Accident__June_8__2011 _in_Paris.pdf; Session 1_France_Presentation JCNV2.pdf; Session 1 _Korea_Fukushima_Forum_YCH.pdf; Session 2_JM Miracourt_AEN OCDE 8 Juin 2011.pdf; Session 2_Russian presentation.pdf; Session 2_Spanish_2011-06-08 FORO NEA.pdf; Session_2_Canada_NEA slides Paris June 2011.pdf

Please print these in color and put them in my Commission meeting binder. Thanks.

From: Castleman, Patrick
Sent: Friday, June 10, 2011 3:35 PM
To: Svinicki, Kristine
Cc: Sharkey, Jeffry
Subject: FW: FYI: Material from the OECD/NEA Forum on Fukushima

FYI.

From: Marshall, Michael
Sent: Friday, June 10, 2011 11:23 AM
To: Orders, William; Franovich, Mike; Gilles, Nanette; Hipschman, Thomas; Castleman, Patrick
Subject: FYI: Material from the OECD/NEA Forum on Fukushima

Hello,

Attached are the presentations that were available electronically from the OECD/NEA forum on Fukushima.

Michael L. Marshall, Jr.
Policy Advisor for Reactors
Office of the Chairman
U.S. Nuclear Regulatory Commission

Phone: 301-415-1750
Email: michael.marshall@nrc.gov

U.S. Industry Leadership in Response to Events at the Fukushima Daiichi Nuclear Power Plant

NEI NUCLEAR ENERGY INSTITUTE

INPO

EPRI ELECTRIC POWER RESEARCH INSTITUTE

June 8, 2011

1. EXECUTIVE SUMMARY

The earthquake and tsunami in Japan on March 11, 2011 and subsequent nuclear accident at Tokyo Electric Power Co.'s Fukushima Daiichi nuclear power plant have resulted in worldwide attention toward nuclear energy safety. The leadership of the U.S. commercial nuclear industry is dedicated to gaining a deep understanding of the events at Fukushima Daiichi and to taking the necessary actions to improve safety and emergency preparedness at America's nuclear energy facilities.

The Electric Power Research Institute (EPRI), Institute of Nuclear Power Operations (INPO), and Nuclear Energy Institute (NEI), in conjunction with senior utility executives, have created a joint leadership model to integrate and coordinate the U.S. nuclear industry's response to events at the Fukushima Daiichi nuclear energy facility. This will ensure that lessons learned are identified and well understood, and that response actions are effectively coordinated and implemented throughout the industry. This must be accomplished while electric companies continue to ensure that the safe and reliable operation of commercial reactors is our highest priority. This effort will not diminish the independent roles of the industry support groups, such as the role of INPO to promote the highest levels of safety in U.S. commercial reactors, as actions are taken to fulfill their missions.

An important and integral aspect of the industry's response is the awareness and involvement of the industry's many stakeholders, including industry vendors, architect-engineering companies, industry owners' groups and national consensus nuclear standards organizations. This will ensure that the interests of each stakeholder group are considered, understood and communicated to the public and policymakers.

A comprehensive investigation of the events at Fukushima Daiichi will take considerable time. Yet, there is also a need to act in a deliberate and decisive manner. Recognizing this, America's nuclear energy industry is taking action based on a preliminary understanding of the events. The industry's response is structured to ensure that emergency response strategies are updated based on new information and insights learned during subsequent event reviews.

Separately, the U.S. Nuclear Regulatory Commission (NRC) is conducting an independent assessment and will consider actions to ensure that its regulations reflect lessons learned from the Fukushima events. The industry's response will ensure that the NRC and industry remain informed of each other's respective activities so that any new regulatory requirements are implemented in the most efficient and effective manner.

This strategic overview describes how the industry will approach this challenge and is intended to serve as a reference point for the future. It articulates strategic goals and key stakeholders for the industry's integrated response. In addition, this overview describes the respective roles and coordination of industry organizations in managing the discrete elements of a comprehensive U.S. industry response plan.

2. STRATEGIC GOALS

The primary objective is to improve nuclear safety by learning and applying the lessons from the Fukushima Daiichi nuclear accident. In response, the U.S. nuclear industry has established the following strategic goals to maintain, and where necessary, provide added defense in depth for critical safety functions, such as reactor core cooling, spent fuel storage pool cooling and containment integrity:

1. The nuclear workforce remains focused on safety and operational excellence at all plants, particularly in light of the increased work that the response to the Fukushima event will represent.

2. Timelines for emergency response capability to ensure continued core cooling, containment integrity and spent fuel storage pool cooling are synchronized to preclude fuel damage following station blackout.

3. The U.S. nuclear industry is capable of responding effectively to any significant event in the U.S. with the response being scalable to support an international event, as appropriate.

4. Severe accident management guidelines, security response strategies (B.5.b), and external event response plans are effectively integrated to ensure nuclear energy facilities are capable of a symptom-based response to events that could impact multiple reactors at a single site.

5. Margins for protection from external events are sufficient based on the latest hazards analyses and historical data.

6. Spent fuel pool cooling and makeup functions are fully protective during periods of high heat load in the spent fuel pool and during extended station blackout conditions.

7. Primary containment protective strategies can effectively manage and mitigate post-accident conditions, including elevated pressure and hydrogen concentrations.

3. GUIDING PRINCIPLES

To achieve our strategic goals, the industry has established principles to guide the development of its response actions. These principles will be used to guide the resolution of issues and plant improvements and will ensure that a consistent expectation is established for incorporating lessons into the operations at each site. The strategic response actions will be designed to:

1. Ensure equipment and guidance, enhanced as appropriate, result in improvements in response effectiveness.

2. Address guidance, equipment and training to ensure long-term viability of safety improvements.

3. Develop response strategies that are performance-based, risk-informed and account for unique site characteristics.

4. Maintain a strong interface with federal regulators to ensure regulatory actions are consistent with safety significance and that compliance can be achieved in an efficient manner.

5. Coordinate with federal, state and local government and their emergency response organizations on industry actions to improve overall emergency response effectiveness.

6. Communicate aggressively the forthright approach the U.S. industry is taking to implement the lessons from the Fukushima Daiichi accident.

4. STAKEHOLDERS AND DESIRED OUTCOMES

The industry's strategic goals will be achieved by proactively engaging a variety of stakeholders.

The industry will ensure that the general public is well-informed of the collective approach in response to the Fukushima accidents. Special attention will be paid to engaging stakeholders (residents, elected officials and other stakeholders) immediately surrounding nuclear energy facilities to maintain confidence in their plant's continued safe operations and ability to protect public health and safety.

The industry will provide information to its employees to understand the operating experience from Fukushima as part of their training to execute their jobs with excellence and be advocates for nuclear safety.

The industry will continue to communicate and cooperate with federal, state and local emergency response organizations and government entities to ensure that emergency response plans reflect the lessons learned from the Fukushima Strategic Response Plan. These organizations include, but are not limited to, state and local police; fire officials; health officials/paramedics; federal, state and local governments; and transportation companies. Interactions will be focused on increasing confidence in the industry's and local government emergency preparedness programs.

Utilities, industry vendors and owners groups, architect-engineers, manufacturers and companies and organizations involved in the nuclear fuel cycle, working as a collective worldwide industry, will continue to strive for operational excellence. These actions and goals will continue the ongoing contribution to the legacy of safe, reliable, environmentally responsible production of electricity at nuclear energy facilities. The industry will work with all interested parties to ensure the benefits of nuclear energy for future generations.

The industry will maintain relationships with federal and state regulators to ensure the industry participates in the regulatory process and can effectively implement any regulatory changes.

The industry will continue to collaborate with technical associations and organizations to ensure information is disseminated and understood by all interested parties so that the benefits and positions of nuclear energy are appreciated and support the industry's long-term objectives.

The industry will proactively communicate lessons learned and industry actions such that policy and opinion leaders at the local, state and national level recognize the proactive, unwavering industry response to the Fukushima accident. The industry will continue to focus on improving confidence in the safety of U.S. nuclear energy facilities and assuring support for industry legislative proposals and programs that enhance safety.

The U.S. nuclear industry will interact with international nuclear energy companies and organizations to compile and assess recommendations and actions for applicability to U.S. facilities and to make the international industry aware of U.S. improvements.

5. LEADERSHIP MODEL OVERVIEW

The nuclear industry has successfully demonstrated the ability to identify and manage the response to various issues in a coordinated manner. Under normal circumstances, the structures are in place to successfully coordinate the response to significant issues among key industry groups. For the response to the Fukushima event, however, there is a need for a greater level of coordination with the number and complexity of potential issues that are identified by each of the key industry groups. As a result, we have developed a coordinating framework for the development and execution of actions in response to the lessons of the Fukushima event.

The leadership model is based on the following elements:

Organization – clear division of responsibilities among the involved parties. An industry steering committee will provide strategic direction and oversight. Ownership for analysis and execution will be organized around the industry's seven building blocks based on the type of issue being addressed.

Event Response Process – each industry organization (see chart on page 9) is responsible for identifying issues, plant and process improvements, and regulatory reviews of the Fukushima events. Issue descriptions, including action plans and recommendations, will be developed to implement improvements. The steering committee will approve the actions and designate an industry organization and building block to lead and implement the action to resolution.

Issue Action Plans – action plans with schedules and resource management tools will be developed and executed for each issue within its assigned building block.

Strategic Response Plan – all issues assigned to the seven building blocks constitute the nuclear industry's response. The action plans will be summarized by building block to form the strategic response plan.

Execution Oversight and Status Tracking – each industry organization and its building block(s) will regularly report the status of all issues to the steering committee.

The leadership model is organized around seven areas called building blocks. Building blocks are temporary organizations created to develop and execute action plans for issues assigned to them by the steering committee. Building blocks led by an individual assigned by the industry organization will consist of assigned managers and designated personnel from the industry organizations, utilities, and suppliers. Building block oversight is provided by the steering committee, lead industry organization, and the assigned steering committee sponsor.

The seven building blocks along with the lead organization(s) and focus are identified below:

1. **Maintain Focus on Excellence in Existing Plant Performance (INPO):** focus on continued performance improvement of U.S. reactors.

2. **Develop and Issue Lessons Learned from the Fukushima Events (INPO):** focus on comprehensive analysis of the Fukushima event and that lessons learned are applied to the U.S. nuclear industry and shared with the World Association of Nuclear Operators (WANO).

3. **Improve the Effectiveness of U.S. Industry Response Capability to Global Nuclear Events (INPO/NEI):** focus on identified lessons learned from the U.S. industry response to the Fukushima event, allowing for more effective integrated response to future events.

4. **Develop and Implement a Strategic Communications Plan (NEI):** focus on managing the industry's strategic communications and outreach campaigns to recover policymaker and public support for nuclear energy.

5. **Develop and Implement the Industry's Regulatory Response (NEI):** focus on managing the industry's regulatory interactions and resolution of applicable industry regulatory issues from the incident.

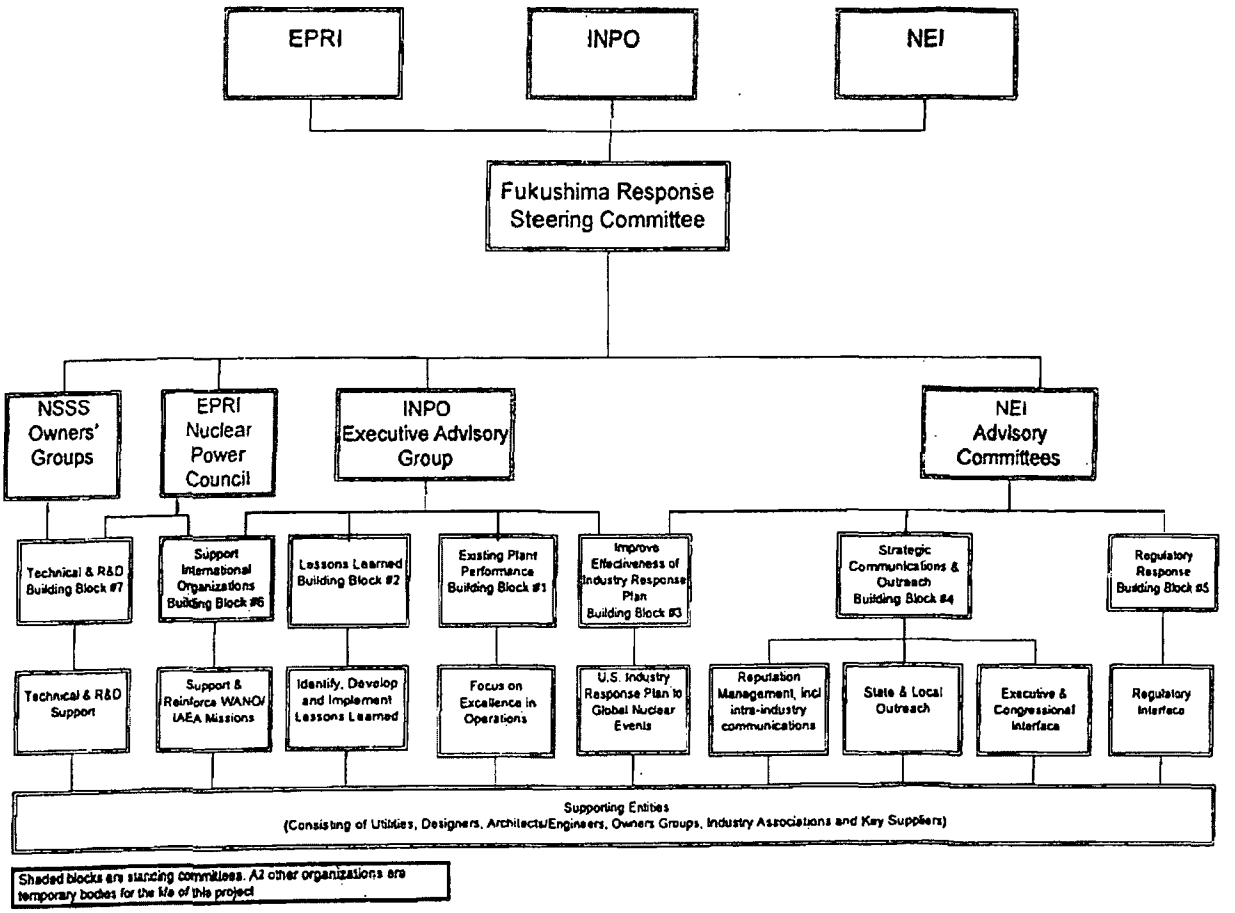
6. **Participate and Coordinate with International Organizations (INPO/EPRI):** focus on ensuring the results from international investigations are captured and effectively used to inform actions with the other building blocks.

7. **Provide Technical Support and R&D Coordination (EPRI/NSSS Owners' Groups):** focus on existing technical solutions and research and development activities and deliverables necessary to address recommended actions of this plan.

Each building block will be supported by nuclear and, in specific instances, non-nuclear industry organizations and companies, where specific technical, operational or other expertise is required.

6. LEADERSHIP RESPONSE ORGANIZATION AND BUILDING BLOCKS

The leadership model structure involves many industry participants and is outlined below:



Fukushima Response Steering Committee Charter

The U.S. nuclear industry has formed a Fukushima Response Steering Committee to coordinate the industry's overall response to the accident at Japan's Fukushima Daiichi nuclear plant. The steering committee is comprised of the chairpersons of the principal advisory groups to the industry associations (EPRI, INPO and NEI) a representative cross section of chief nuclear officers and executives from EPRI, INPO and NEI.

Members

- Chip Pardee, Chief Operating Officer, Exelon Generation Company, NEI NSIAC Chair, Fukushima Response Steering Committee Chairman
- Randy Edington, Executive Vice President and Chief Nuclear Officer, Arizona Public Service Company, INPO EAG Chair
- Maria Korsnick, Chief Nuclear Officer and Chief Operating Officer, Constellation Energy Nuclear Group, EPRI NPC Chair
- John Herron, President, Chief Executive Officer and Chief Nuclear Officer, Entergy Nuclear
- Ed Halpin, President and Chief Executive Officer, STP Nuclear Operating Company
- Dave Heacock, President and Chief Nuclear Officer, Dominion Nuclear
- Dennis Koehl, Vice President and Chief Nuclear Officer, Xcel Energy
- Mike Pacilio, Chief Nuclear Officer, Exelon Corporation
- Bill Webster, Senior Vice President, Industry Evaluations, INPO
- Rick Purcell, Senior Vice President, Industry Performance Improvement, INPO
- Neil Wilmshurst, Vice President and Chief Nuclear Officer, EPRI
- Tony Pietrangelo, Senior Vice President and Chief Nuclear Officer, NEI

The steering committee is chartered to:

1. Develop a strategic plan that articulates the strategic goals, structure and process for defining the industry's overall response to Fukushima;

2. Ensure that identified issues are appropriately coordinated between industry organizations and that lead and supporting roles are established; and

3. Monitor the status of action plans on key issues to ensure priorities and schedules are consistent with the strategic plan and that the overall impact on operating plants is balanced and appropriate to the industry's prime focus, excellence in safe operations.

Notes:

1. The development and management of actions plans for identified issues will be implemented under the purview and governance of the lead industry organization.

2. The formation of this steering committee shall in no way diminish the independent roles of the industry support groups as they take the actions necessary to fulfill their missions.

3. The steering committee chairman will assess the continued need for the steering committee at the conclusion of 2011, and every six months thereafter. A report will be made to the leadership of INPO, EPRI and NEI.

1 June 2011

Organisation for Economic Co-operation and Development

Nuclear Energy Agency

French Government, Chair G20 – G8

Forum on the Fukushima Accident

Insights and Approaches

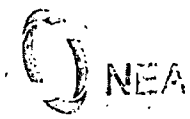
Programme

8 June 2011

Organisation for Economic Co-operation and Development Conference Centre

Paris, France

General Information – Programme



Forum on the Fukushima Accident: Insights and Approaches

Programme Information

8 JUNE 2011

OECD Conference Centre, Paris, France

GENERAL INFORMATION

The Organisation for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA) Committee on Nuclear Regulatory Activities (CNRA) will sponsor a forum on Insights and Approaches as a result of the Fukushima Accident. The forum will be held at the OECD Conference Centre in Paris, France and will take place **on 8th June 2011.** This meeting is organised in conjunction with the meeting of Ministers involved on nuclear safety called on 7th June by the French Government, chairing the G8 – G20 this year.

Objectives

The main objectives of the Forum are to provide the opportunity to exchange information on emerging lessons learnt, safety implications and national activities in response to the Fukushima accident, and to define areas where international co-operation can be of benefit. Participants will have the opportunity to meet with their counterparts from other countries and organisations to discuss current and future issues on this topic, to provide guidance to the CNRA and the CSNI for future activities, and to provide input for the IAEA Ministerial Conference on Fukushima, which will be held the week of 20 June 2011 in Vienna.

Background

As a result of the Fukushima accident, the safety of all nuclear power plants worldwide has come under close scrutiny. Regulatory bodies and industry have been called upon to affirm the safety of its nuclear power plants, regardless of their type. During the 5th Review meeting of the Convention of Nuclear Safety this year in Vienna, it was clear that further collaborative discussions dedicated to the emerging lessons learnt would be beneficial in identifying ways to combine efforts internationally to improve understanding of the event and to move forward in an effective and efficient manner.

All countries with operating nuclear power plants have embarked on assessments of the plants in areas that were immediately evident from the Fukushima accident. Many of the reviews include an evaluation of the ability to withstand severe accident situations related, among others, to:

- external natural events,
- long term loss of electrical supply,
- long term loss of ultimate heat sink,
- combustible gas management,

- spent fuel pool cooling,
- severe accident management,
- emergency planning and preparedness, and
- crisis communication.

Additionally, the CNRA has established a senior-level task group to exchange information on national activities and look at generic implications of the event. The task group will identify areas where an in-depth evaluation would be of benefit and can be undertaken by CNRA or CSNI working groups, or by new task groups to address gaps that are not within the scope of an existing working group.

Format

The Forum sessions will be divided into an Opening Session, two Discussion Sessions: Insights and Approaches, and a Concluding Session on international co-operation.

Opening Session

This will include presentations by the NEA and the Japanese Government to provide a framework of Forum and a perspective of the current situation and the role of international cooperation. Additionally, the Chair of the ministerial meeting on Nuclear Safety, held on 7 June, will address to Forum on issues discussed the previous day.

Discussion Sessions

There will be two main discussion sessions,

- Insights, what are we learning from the accident, and
- Approaches, how are we reacting to the insights.

For each session, first there will be a few presentations, followed by a panel and open discussion with the audience. In each session, there will be mostly representatives from regulatory bodies, but also industry to provide different perspectives on the discussion topic.

Moving Forward and International Co-operation Session

As the capstone session of the forum, panellists will provide their vision and insights on the policy decisions and the path forward for the resolution of challenges. From this session, issues will be identified for further CNRA and CSNI activities and, for input to the upcoming IAEA ministerial conference on Fukushima.

Participants

It is expected that the participation in the Forum will be mainly be top-level executives and managers from regulatory bodies, technical support organizations and industry.

Language

All presentations, discussions, and meeting documents will be in English.

Informal Sessions

In order for Participants to be able to communicate and exchange information on other topics of interest, informal opportunities for discussion will be available during the lunch period and morning and afternoon breaks. Additionally, an evening reception has been arranged following the Forum.

NEA Forum Contacts

Javier Reig, e-mail: Javier.Reig@oecd.org

Diane Jackson, e-mail: Diane.Jackson@oecd.org

Greg Lamarre, e-mail: Greg.Lamarre@oecd.org

Alejandro Huerta, e-mail: Alejandro.Huerta@oecd.org

Elisabeth Mauny, e-mail: Elisabeth.Mauny@oecd.org

Nuclear Energy Agency
Le Seine St.-Germain
12, boulevard des Iles
92130 Issy-les-Moulineaux
FRANCE
Tel: +33 (0)1 45 24 10 51

Forum on the Fukushima Accident: Insights and Approaches

Programme

8 JUNE 2011

OECD Conference Centre

Paris, France

Opening session

(09:00-09:40 hrs)

Welcome address

Luis E. Echávarri
OECD/NEA Director-General

Statement by the Chair
of the Ministerial Forum on Nuclear Safety

Nathalie Kosciusko-Morizet
French Minister for Ecology, Sustainable Development, Transport and Housing

Session 1: Insights: What are we learning?

Chair: ***Mike Weightman***
HM Chief Inspector, ONR, CNRA Chair, United Kingdom

Presentations
(09:40-11:20 hrs)

Koichiro Nakamura
Deputy Director-General for Nuclear Safety, NISA, Japan
TEPCO's Fukushima Nuclear Power Station Accident

Terry Jamieson
Vice-President, CNSC, Canada
Review of Japan 2011 Nuclear Event: Implications for Canadian Nuclear Power Plants

Jean-Christophe Niel
Director-General, ASN, France
First Lessons Learnt and Subsequent First Actions Taken in France

Choul-Ho Yun
President, KINS, Korea
Fukushima Accident: Its Impact and Actions Taken in Korea

Laurent Stricker
Chairman, WANO
WANO after Fukushima: Strengthening Global Nuclear Safety

Coffee break (11:20-11:45 hrs)

Panel discussion
(11:45-12:45 hrs)

S.S. Bajaj
Chairman, AERB, India

Hans Wanner
Director-General, ENSI, Switzerland

Edward D. Halpin
President and CEO, CNO and Chairman of the Board of Directors, STP Nuclear Operating Company, United States

Harri Tuomisto
Director Nuclear Oversight, Fortum Generation, Finland

Lunch Break (12:45 – 14:00 hrs)

Session 2: Approaches: What actions are we taking?

Chair: André-Claude Lacoste
Chairman, ASN, France

Presentations
(14:00-15:40 hrs)

Jukka Laaksonen
Director-General, STUK and Chairman, WENRA, Finland
Focused Safety Assessment of NPPs in the European Union, Aiming for Improved Protection Against External Hazards

Gregory B. Jaczko
Chairman, NRC, United States
US NRC Approach and Actions to Address the Fukushima Accident

Nikolay Kutin
Chairman, Rostechnadzor, Russia
Actions in the Russian Federation Taking into Account Lessons Learnt from the Fukushima Accident

Carmen Martínez Ten
President, CSN, Spain
Spanish Nuclear Safety Council Crisis Communication Management: The Fukushima Accident

Takuya Hattori
President, JAIF, Japan
Fukushima Accident: Actions for the Future from Industry's Perspective

Coffee break (15:40-16:00 hrs)

Panel discussion
(16:00-17:00 hrs)

Marta Ziaková
Chair, UJD, Slovak Republic

Boyce M. Mkhize
CEO, NNR, South Africa

Duncan Hawthorne
President and CEO, Bruce Power, Canada

Jean-Marc Miraucourt
Director Nuclear Engineering, EDF, France

Session 3: Moving forward and international co-operation

Chair: ***Gregory B. Jaczko***
Chairman, NRC, United States

(17:00-18:00 hrs)

Luis E. Echávarri
Director-General, OECD/NEA

James E. Lyons
Director, Division of Nuclear Installation Safety, IAEA

André-Claude Lacoste
Chairman, ASN, France

Koichiro Nakamura
Deputy Director-General for Nuclear Safety, NISA, Japan

Mike Weightman
HM Chief Inspector, ONR, CNRA Chair, United Kingdom

Nikolay Kutin
Chairman, Rostechnadzor, Russia

Press Conference

A short press conference may held to transmit key messages of the Forum

Forum Reception

6:00 p.m.
Participants are invited to a reception in the Château de la Muette