Current Status of Fukushima Dai-Ichi NPS

September 17,　2012
Tokyo Electric Power Company

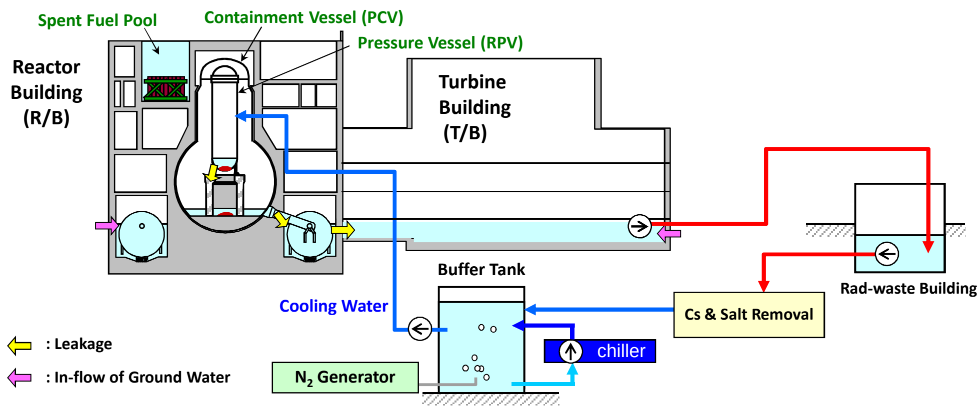
Side Event by Government of Japan
at 56th IAEA General Conference, Sep 17, 2012

東京電力 TEPCO

Contents

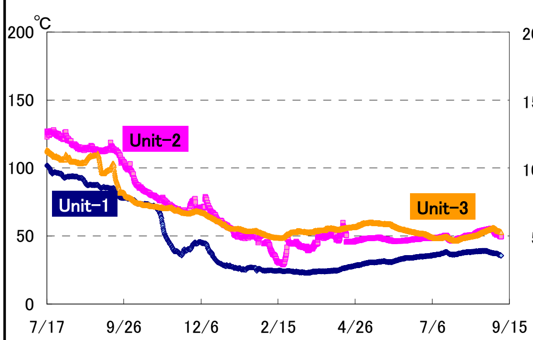
【１】 Core Cooling ～ Circulating Water Cooling System ～

- Injected Cooling water is leaking from RPV, PCV and R/B to T/B.
  Accumulated water in T/B is re-used as coolant after Cs and salt removal.
- Components of RPV injection system have redundancy, diversity and independency.
- A chiller has been installed into the RPV injection system to decrease temperature and amount of core injection water. (operation started:Jul.18,2012)

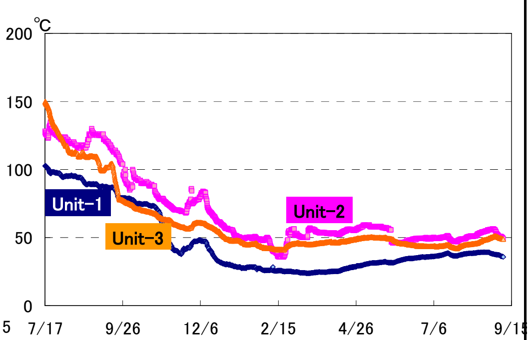


【１】 Cold Shutdown Conditions

- Circulating water cooling continued since June 27, 2011
- ✓ The temperatures at the RPV bottom and inside PCV were approx. 35 ℃ -55℃ (as of Sep.5,2012).
- There is no significant fluctuation in parameters such as PCV internal pressure and amount of radioactive material releases from the containment vessel.
- Thus it is determined overall that cold shutdown conditions are being maintained.



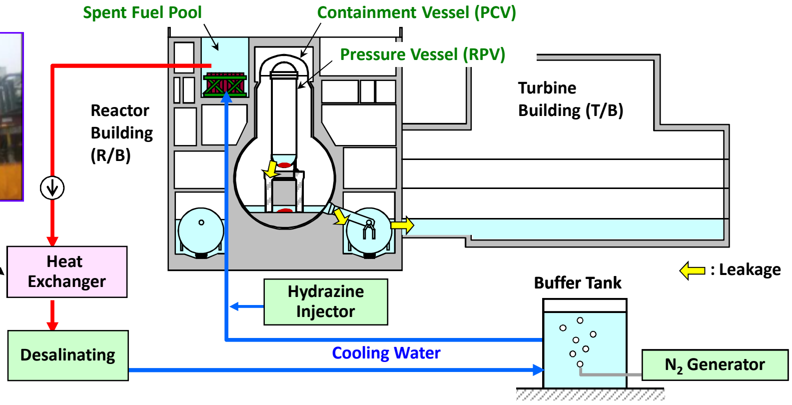
RPV bottom temperature



Temperature in PCV

【1】Spent Fuel Pool (SFP) Cooling

- Closed loop with heat exchanger has been established for SFP of Unit 1~4.
- Corrosion mitigation techniques are applied.
  - Deoxidation by N_2 and Hydrazine
  - Salt Removal (originated from sea water injection)



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【2】Mitigation of the Release of Radioactive Materials

- Spraying dust inhibitor agents to mitigate spreading of powder dust containing radioactive materials.
- Unit 1 reactor building cover installation completed (Oct. 28, 2011).
- Radiation dose at the site is being held down due to rubble removal.
- PCV gas control systems for Unit 1~3 in operation.
  - ✓ Maintain the PCV pressure at the same level as the atmosphere in order to control the amount of radioactive materials released from the PCV.

Unit 1 reactor building cover installation

Containers storing rubble

Spraying dust inhibitor agents to the buildings and site ground

Rubble storage area（tent and container）

Removal of rubble

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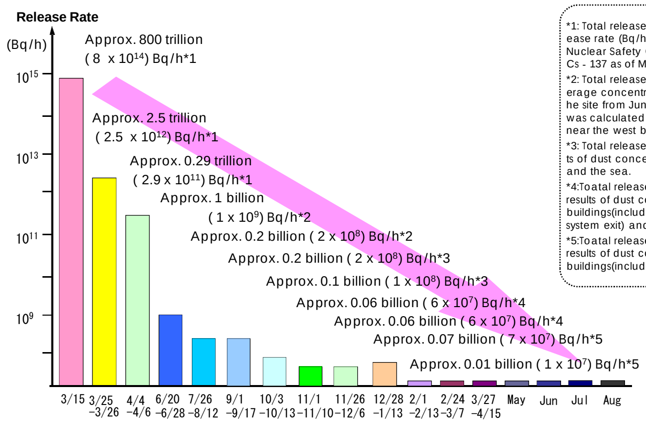
【2】Mitigation of the Release of Radioactive Materials

- Utilizing the airborne radioactivity concentration at the upper parts of the reactor buildings etc., the total current release rate (Cs) from Units 1 to 3 (8/2012) is estimated to be approximately **10 million Bq/hour**. This is approximately 80 millionth of the release rate right after the accident.
- The exposure dose at the site boundaries due to the aforementioned is assessed at **0.02 mSv/year** at the maximum (excluding the effect of radioactive materials already released until now).



Evaluation Period

*1: Total release rate (Bq/h) of Cs - 134 and Cs - 137 was calculated based on release rate (Bq/h) of Cs - 137 as of Mar. 15 mentioned in the report of the 63rd Nuclear Safety Commission of Japan. Total release rates (Bq/h) of Cs - 134 and Cs - 137 as of Mar. 25 and Apr. 5 were calculated in the same way.

*2: Total release rate (Bq/h) of Cs - 134 and Cs - 137 was calculated based on average concentration of Cs - 137 in the air measured near the west boundary of the site from Jun. 20 to Jun. 28. Total release rate (Bq/h) of Cs - 134 and Cs - 137 was calculated based on average concentration of Cs - 137 in the air measured near the west boundary of the site from Jun. 26 to Aug. 12.

*3: Total release rate (Bq/h) of Cs - 134 and Cs - 137 was estimated from the results of dust concentration measurement at the upper parts of the reactor buildings and the sea.

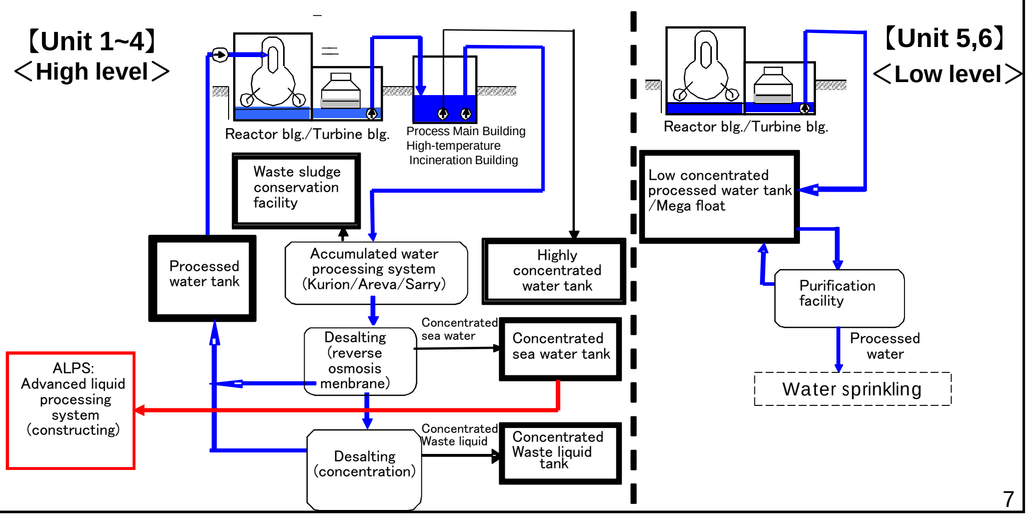
*4:Toatal release rate(Bq/hour) of Cs-134 and Cs-137 was estimated utilizing the results of dust concentration measurement at the upper parts of the reactor buildings(including Unit 1 reactor building cover and Unit 2 PCV gas control system exit) and the sea.

*5:Toatal release rate(Bq/hour) of Cs-134 and Cs-137 was estimated utilizing the results of dust concentration measurement at the upper parts of the reactor buildings(including Unit 1 reactor building cover and PCV gas control system exit).

Release rate of radioactive materials(Cesium) per hour from Reactor Building of 1F Unit 1 - 3

【3】Accumulated Water ～Controlling the total amount of accumulated water～

- Countermeasures for Controlling the total amount of accumulated water
  - ✓prevent groundwater leaking into buildings by pumping up sub-drain water and groundwater bypass.
  - ✓Installation of Multi-nuclide Removal Equipment (ALPS)
  - ✓Store/manage sludge waste and Concentrated Waste liquid etc. Planning to increase capacity.

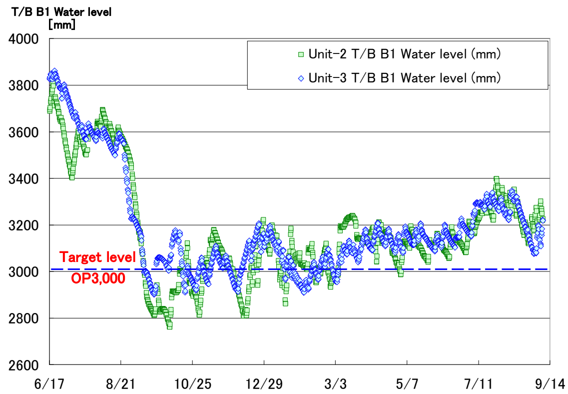


【3】Accumulated water level has been maintained at target level

- After full-scale use of SARRY from Aug. 18, 2011, the accumulated water level has been maintained at the target level of O.P 3,000, where it is able to withstand heavy rains as well as long-term processing facility outages(approximately 1 month).
- At this point, we are continuing and enhancing Circulating water cooling.

- **Sum total of Accumulated water processing**
  approx. 437,150 tons in total (as of Sep. 5, 2012)
- **Cs-137 decontamination factor***
  3.2 X 10^5 in the apparatus of Kurion (as of Jun. 19, 2012)
  4.0 X 10^4 in SARRY (as of Aug. 21, 2012)
- **Chlorine concentration**
  Decreased from 720 ppm to approx. 3ppm
  (by the reverse osmosis equipment ,
  as Aug. 21, 2012)
  Decreased from 6,900 ppm to approx. 2ppm
  (by the evaporative concentration apparatus
  as of Dec. 20, 2011)

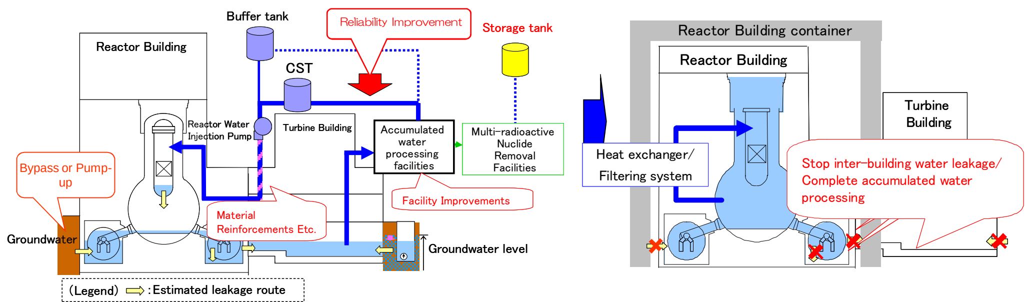
*Decontamination factor = cesium concentration of a sample before processing / cesium concentration of a sample after processing



Management of accumulated water in Turbine Building

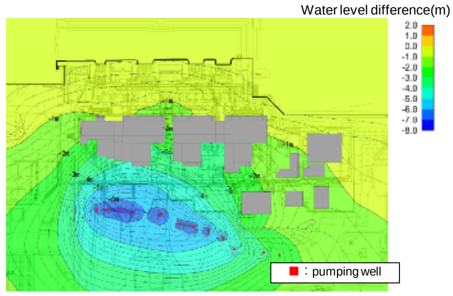
【3】 Future Plan of Reactor Cooling & Water Processing

- **System improvements will be continuously implemented.**
  In addition, the water circulation line will be decreased step-by-step.
- **Multi-nuclide removal equipment will be newly installed.**
- **Cooling loop will be packed into the reactor building, after sealing of the water leakage between Turbine and Reactor Buildings, and repairs of the lower parts of PCVs have been achieved.**

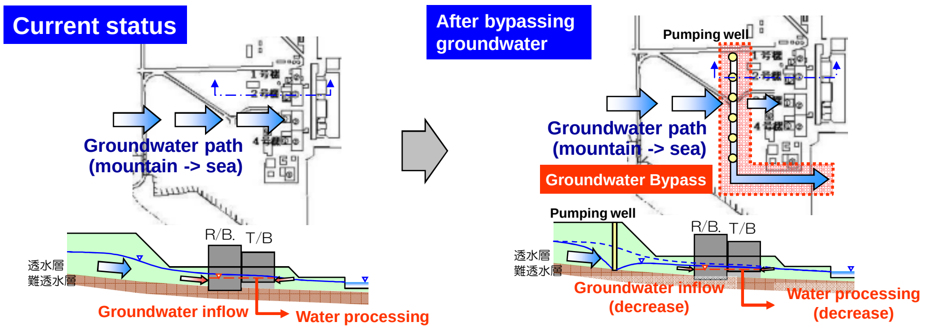


【３】Countermeasure against Ground Water Inflow

- Pump groundwater flowing from the mountain-side upstream of the building to change the flow path of the groundwater.(**Groundwater bypass**)
- Reduce groundwater level near buildings (mainly on mountain-side) with groundwater bypass to reduce flow volume into buildings.
- Installation work of the pumping wells will start from September.

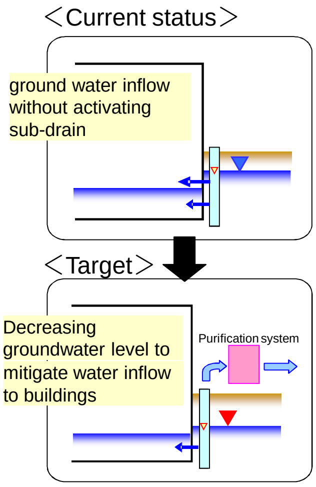


Decrease of groundwater level from the present condition



【３】Countermeasure against Ground Water Inflow

- **Restoration of sub-drain system** :
- ✓Sub-drain is a drainage system to prevent ground water from flowing into partially underground buildings.
- ✓Clean-up tests of the sub-drain pits (shown below) : Purification processes were finished but clean-up was not finished.
- ✓So, we have to install purification system of ground water to release into the ocean.



Sub-drain Clean-up tests results（Unit 1-4 • Typical nuclide）

Top row numbers in charge: activity concentration (Bq/L) Bottom row in parenthesis: sampled date

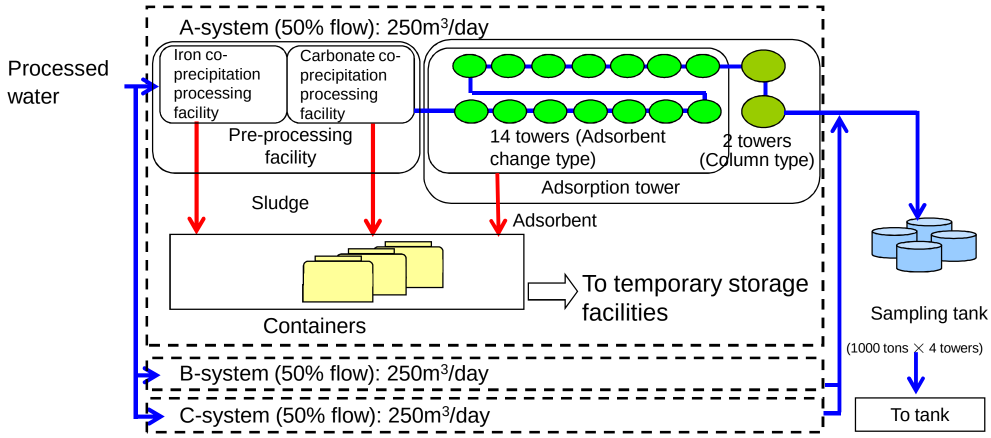
Representative nuclides*1			Unit 1	Unit 2					Unit 4		
			No.1	No.23	No.24	No.25	No.26	No.27	No.53	No.55	No.56
γ nuclides (18)	Cs-134	Pre –test	2,313 (3/15)	37,120 (10/21)	335 (1/17)	296 (1/17)	7,012 (10/25)	271 (1/17)	17 (3/15)	49 (1/20)	13 (1/20)
		Post- test	95 (6/19)	276 (6/18)	116 (6/19)	645 (6/17)	122 (6/18)	131 (6/18)	1.7 (5/17)	2.0 (5/17)	0.89 (5/17)
	Cs-137	Pre –test	3,661 (3/15)	46,180 (10/21)	451 (1/17)	384 (1/17)	9,630 (10/25)	358 (1/17)	11 (3/15)	61 (1/20)	18 (1/20)
		Post- test	161 (6/19)	425 (6/18)	179 (6/19)	990 (6/17)	185 (6/18)	219 (6/18)	2.6 (5/17)	3.4 (5/17)	2.0 (5/17)
	Other γ nuclides① (16) Fe-59, Co-58,Y-91, Nb-95, Ru-103, Ag-110m, Sb-124, Cs-136, Ba-140, Ce-141, Ce-144, Pr-144, Mn-54, Co-60, Zn-65, I-131		Below detectable limits *2 (6/19)	Below detectable limits *2 (6/18)	Below detectable limits *2 (6/19)	Below detectable limits *2 (6/17)	Below detectable limits *2 (6/18)	Below detectable limits *2 (6/18)	Below detectable limits *2 (5/17)	Below detectable limits *2 (5/17)	Below detectable limits *2 (5/17)
Total α			< 10.6 (6/19)	< 10.6 (6/18)	< 10.6 (6/19)	< 10.6 (6/17)	< 10.6 (6/18)	< 10.6 (6/18)	< 11.6 (6/5)	< 11.6 (6/5)	< 11.6 (6/6)
Total β			268 (6/19)	1,052 (6/18)	284 (6/19)	1,737 (6/17)	499 (6/18)	699 (6/18)	< 34.4 (6/5)	< 26.1 (6/5)	< 26.1 (6/6)
Tritium			112,800 (6/19)	3,129 (6/18)	2,407 (6/19)	1,302 (6/17)	754 (6/18)	883 (6/18)	3,826 (6/5)	6,114 (6/5)	5,430 (6/6)

*1: Analysis planned to be completed in or after August for other nuclides (detail nuclides).
*2: Detectable limits differ depending on the nuclide.

【3】Multi-nuclide Removal Equipment (ALPS)

- **Existing facilities remove Cesium mainly.**
- **manage to keep radioactive substance concentrations other than Cesium in processed water well below stipulating dose limits based on provisions .**
- **Installation of Multi-nuclide Removal Equipment (Inservice in Sep. 2012)**

ALPS (Advanced Liquid Processing System)



【3】Multi-nuclide Removal Equipment (ALPS)

- Verified that it can remove target nuclides (62 nuclides) to meet stipulating dose limits and to below N.D.
- Construction of A and common system was finished,Cold test started on Aug.24.

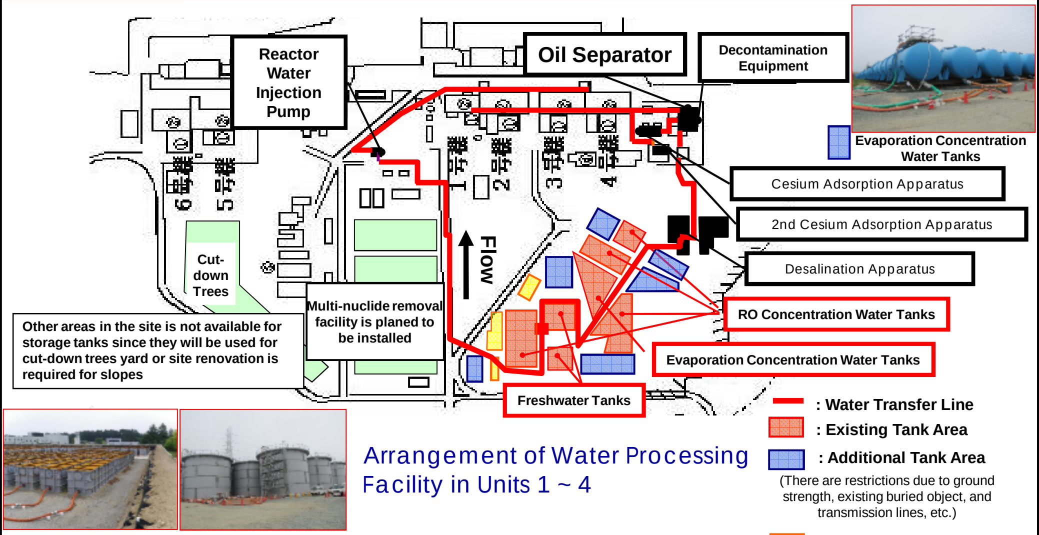
Confirmatory tests result（example of a part of nuclides）

Nuclide (half life)	Density limit	Reverse osmosis concentrated saltwater	
		Before process	After process
Sr-89 (approx. 51 days)	300	12000000	N.D.< 0.28
Sr-90 (approx. 29years)	30	110000000	N.D.< 0.097
Ru-103 (approx. 40 days)	1000	N.D.< 1100	N.D.< 0.15
Ru-106 (approx. 370 days)	100	30000	N.D.< 1.2
Sb-124 (approx. 60 days)	300	N.D.< 570	N.D.< 0.21
Sb-125 (approx. 3 years)	800	100000	N.D.< 0.40
Cs-134 (approx. 2 years)	60	15000	N.D.< 0.29
Cs-137 (approx. 30 years)	90	20000	N.D.< 0.36
Ba-140 (approx. 13 days)	300	N.D.< 3700	N.D.< 0.50
Mn-54 (approx. 310 days)	1000	1100	N.D.< 0.11
Co-58 (approx. 71 days)	1000	N.D.< 700	N.D.< 0.12
Co-60 (approx. 5 years)	20	860	N.D.< 0.18

Overview of installation area

storage container

【3】Situation of Accumulated water storage tanks



Fresh Water, RO Concentration Tanks

■Installed capacity is approx. 225,000 tons (remaining capacity is approx. 28,000 tons as of Sep. 4,2012)
■Adding the capacity of approx. 89,000 tons. And planning to add the capacity of approx. 380,000 tons more.

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【3】 Installation of additional processed water storage tanks

➢Replace square-type steel tanks by large-scale round-type steel tanks (completion:Nov. 2012)

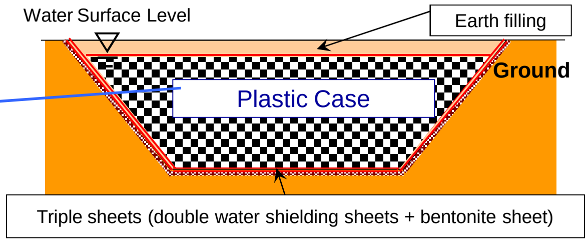
[Total capacity of existing E area tanks: 8,000 tons]

- Approx. 33,000 tons capacity will be added
- Secure/increase storage capacity
- Effective use of the site

After Replace

[Total capacity: 41,000 tons]

➢We will build underground cisterns to the place where large-scale tanks can't be build on the ground due to inadequate ground conditions, etc.



Cross-section view

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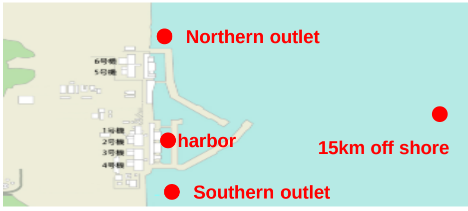
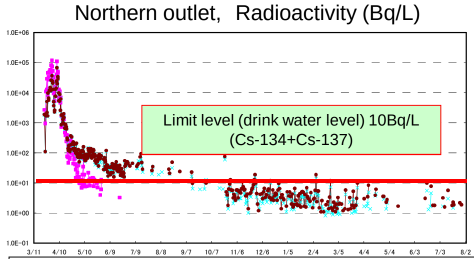
【4】Radioactivity concentration in the ocean (Onshore and offshore)

➢In a declining trend since the accident, and now below a detectable level.

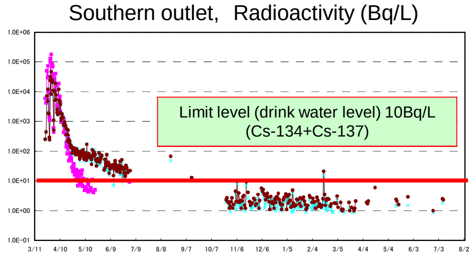
*Notice level：Legal limit　I-131…40　Cs-134…60　Cs-137…90　(Bq/L)



Northern outlet,　Radioactivity (Bq/L)



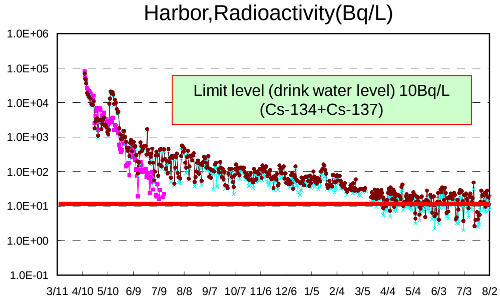
Southern outlet,　Radioactivity (Bq/L)



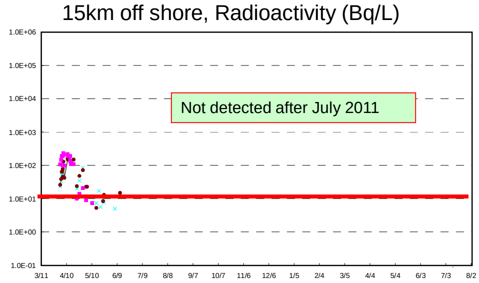
*Scale　Vertical: 1E-1 ~ 1E+6　Horizontal: 2011/3/11 ~ 2012/7/30　*Legend　I-131　Cs-134　Cs-137

【4】Radioactivity concentration in the ocean (Onshore and offshore)

Harbor,Radioactivity(Bq/L)

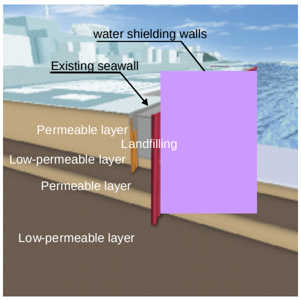


15km off shore, Radioactivity (Bq/L)

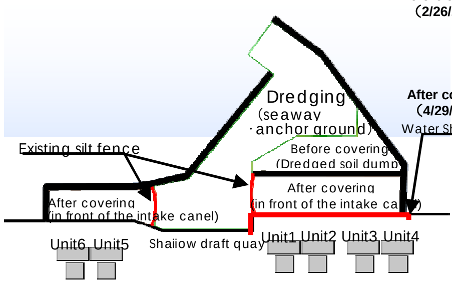


【4】Preventing the Spread of Contamination to the Ocean

- **Impermeable walls will be installed by mid FY2014 to prevent contaminated groundwater from flowing into the ocean.**
- **Covering and solidifying seabed soil in front of the intake canal was finished (Jul. 5,2012) to prevent diffusion of radioactive materials in the soil.**
- **Circulating seawater purification facilities are installed to reduce radioactive materials in the seawater in the port.**
- **Groundwater and sea water will be continuously monitored.**



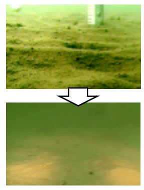
Water Shielding Walls



Seabed Soil in the Port

Covering in front of the intake canal (Unit1～4)

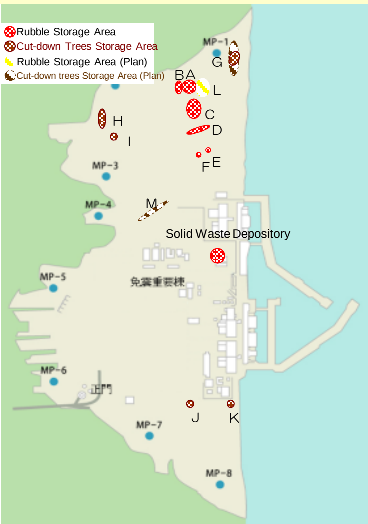
Before covering (2/26/2012)



After covering (4/29/2012)

【5】Countermeasures to reduce radiation dose at the site boundaries due to rubble, etc

- Reduce the effective radiation dose at the site boundaries to below 1 mSv/year within FY2012
  - ✓ effective dose due to additional emissions of radioactive substances from the power station as a whole, and radioactive waste produced after the accident and stored on the site.
- Concrete/metal and Cut-down trees stored in accordance with its radiation dose.
- We build temporary storage facilities with shielding measures using soil and sandbags, etc.

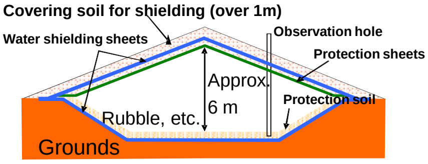


(Aug.10, 2012)

Storage Area	Type	Storage Method	Amount		Area Occupancy
Solid Waste Depository	Concrete,Metal	Container	410	Unit	35%
A: Northern Site	Concrete,Metal	Temporary Storage Facility	11,000	m^3	97%
B: Northern Site	Concrete,Metal	Container	450	Unit	98%
C: Northern Site	Concrete,Metal	Outdoor Yard	26,000	m^3	77%
D: Northern Site	Concrete,Metal	Outdoor Yard	2,000	m^3	84%
E: Northern Site	Concrete,Metal	Outdoor Yard	3,000	m^3	78%
F: Northern Site	Concrete,Metal	Container	100	m^3	99%
Total(Concrete,Metal)			49,000	m^3	78%
G: Northern Site	Cut-down trees	Outdoor Yard	18,000	m^3	83%
H: Northern Site	Cut-down trees	Outdoor Yard	16,000	m^3	88%
I: Northern Site	Cut-down trees	Outdoor Yard	11,000	m^3	100%
J: Southern Site	Cut-down trees	Outdoor Yard	12,000	m^3	77%
K: Southern Site	Cut-down trees	Outdoor Yard	5,000	m^3	100%
M: Western Site	Cut-down trees	Outdoor Yard	9,000	m^3	44%
Total(Cut-down trees)			71,000	m^3	77%

Completion of preparatory work for first unit

Covering soil for shielding (over 1m)



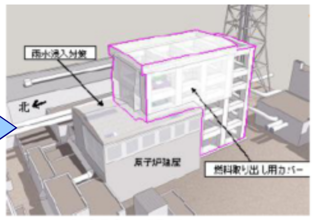
Overview of Covering Soil Type Temporary Storage Facility

【６】 Fuel Removal from Spent Fuel Pools

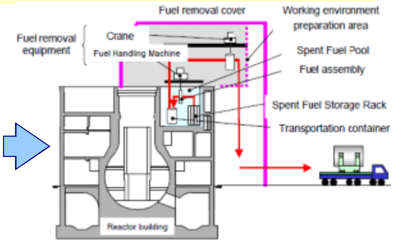
- ➢Plan to start fuel removal
- ✓Unit 4 within 2 years after completing Step 2*.
- ✓Unit 3 within approximately 3 years after completing Step 2* .
- ➢As for Unit 1, based on experiences at Units 3 & 4 and investigations of rubble, and finish fuel removal in the Phase 2*.
- ➢As for Unit 2, plan to develop a fuel removal plan based on the situation after the inside-building decontamination etc. and investigations of the installed facilities, and finish fuel removal in the Phase 2*.
- ➢Plan to complete fuel removal from all Units during Phase 2*.
- ➢Plan to determine reprocessing & storing methods for removed fuels during Phase 2*.

notes: Step2:Roadmap towards restoration from the accident , Phase2:Mid-and-long term Roadmap towards the Decommissioning

Rubble removal from the top of Reactor building (targeted completion in the middle of FY2012)



Installation of Fuel removal cover (construction started from April 2012, targeted completion in the middle of FY2013)



Fuel removal work (targeted start from December 2013)

Fuel removal work (image)

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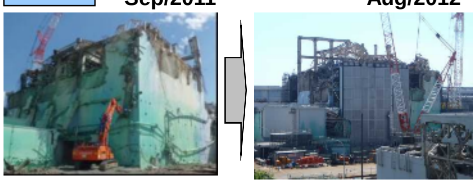
【６】 Fuel Removal from Spent Fuel Pools **(Unit 4, 2013~)**

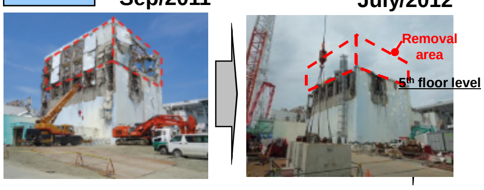
- ➢In order to install a cover for debris removal, removing rubble from the top of the reactor building and building a gantry for rubble removal are underway.

  (Target completion date; around the end of FY 2012 for Unit 3 and around the middle of FY 2012 for Unit 4)
- ➢Unit 3: Surveyed inside the SFP using remote controlled underwater camera (April 13, 2012)
- ➢Unit 4: Surveyed on rubble dispersion inside the SFP using Remotely Operated Vehicle (March 19 ~ 21, 2012), and created a rubble dispersion map (April, 2012).

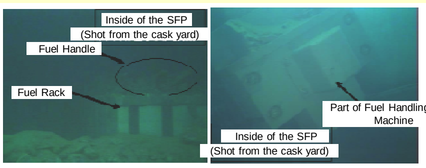
Unit 3 Sep/2011 Aug/2012



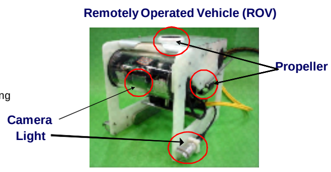
Unit 4 Sep/2011 July/2012



Pre-survey in the water of Spent Fuel Pool (SFP)



Survey on rubble dispersion inside the SFP



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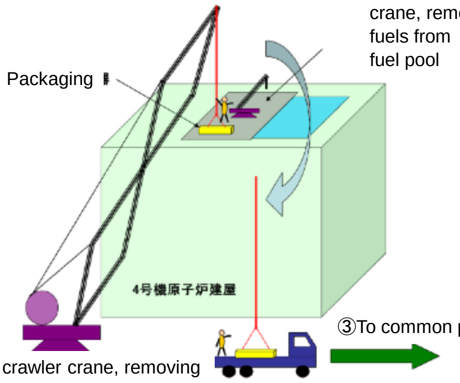
【6】Fuel Removal from Spent Fuel Pools (Unit 4, 2013~)

➢Unit4：Integrity survey of Fresh Fuels from the Spent Fuel Pool

- 2 Fresh Fuels were removed from the Spent Fuel Pool (July 18 – 19, 2012), and integrity survey was performed to check corrosion (August 27 – 29, 2012).

Outline of the work



Packaging

①Using a rough Terrain crane, removing fresh fuels from the spent fuel pool

②Using a crawler crane, removing fresh fuels to ground level.

③To common pool

Removal of fresh fuel from Unit4 spent fuel pool

【6】Fuel Removal from Spent Fuel Pools (Unit 4, 2013~)

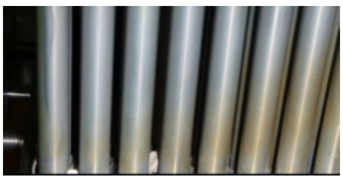
➢Unit4：Integrity survey of Fresh Fuels from the Spent Fuel Pool

✓In order to perform visual inspection and detail observation, a connecting fuel rod was removed on the operating floor of the common pool.

✓It was confirmed that rubble entered between fuel rods, neither abnormalities nor corrosion of fuel rods and the structural member of fuel assembly was found.

①Situation of the work

②Rubble found in the fuel



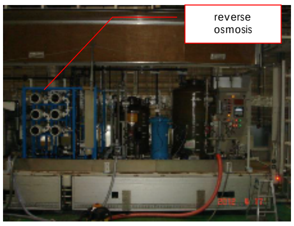
③Rust on the fuel rods

④Confirmed that the rust was wiped out

Photo :Aug. 28, 2012

【6】Fuel Removal from Spent Fuel Pools (Water Quality Improvement)

➢Desalination for corrosion prevention of SFP is done in turn by reverse osmosis (RO) and ion-exchange equipment. For Unit 3 and 4 desalination is ongoing.



RO Unit (mobile type)

Ion Exchange Unit (mobile type)

SFP water quality sampling results (Aug. 2012)

	Sampling Date	pH	conductivity	Cl	Cs137	Cs134	notes
		—	mS/m	ppm	Bq/cc	Bq/cc	
Unit 1	2012/ 7/11	7.6	15.8	6	1.8E+04	1.1E+04	＊Cl ,Cs137,134: sampled on 2012.4.11
Unit 2	2012/ 7/1	9.1	9	11	2.2E+01	1.4E+01	
Unit 3	2012/ 8/30	9.2	54	73	2.8E+03	1.7E+03	desalination is ongoing
Unit 4	2012/ 8/17	9.6	23	31	1.8E+00	8.2E−01	desalination is ongoing

【6】Fuel Removal from Spent Fuel Pools （transport・custody）

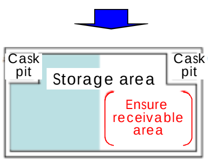
➢ Transportation of fuels in the spent fuel pool

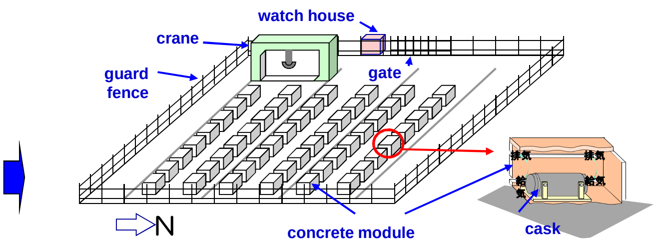
①Transfer fuel in the spent fuel pool to the common pool

②Transfer fuel in the common pool to the temporary cask custody area

➢ Temporary cask custody area

- Ensure an area to receive and store the fuel removed from the spent fuel pools
- The spent fuel currently stored in the common pool will be stored in dry casks and move out of the common pool, and temporary stored.





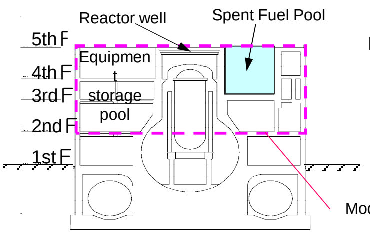
①Fuels in the spent fuel pools are transferred to the common pool by shipping cask

②Fuels in the common pool will be stored in casks and move to Temporary cask custody area.

Transportation and Custody of Fuel in the Spent Fuel Pool (image)

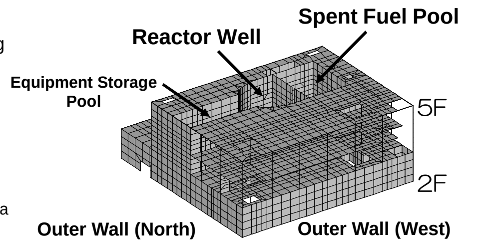
【7】Countermeasures against Aftershocks and Tsunami

- ➢we conducted detailed seismic evaluation of Reactor Buildings with finite element model considering the building damage and conditions of the pool water at high temperatures.
- ✓Confirmed seismic safety without reinforcement against the earthquake equivalent to the Tohoku-Pacific Ocean Earthquake (JMA Seismic Intensity Scale 6+)
- ✓The maximum shear strain of the wall was less than twentieth part of the criterion value. The seismic safety of the building is almost equivalent to that of before the earthquake.
- ➢Future evaluation of age-related deterioration
- ✓Deterioration by heat :Stable cooling of fuel debris and fuels in SFP has been continued. Concrete was temporarily exposed to high temperature. But deterioration of concrete won't proceed after temperature of concrete dropped to ordinary level.
- ✓Deterioration by sea water :R/B's seismic safety as of now was confirmed by the analysis. In the analysis model, reinforced concrete members with exposed rebar were not considered. Furthermore, we are going to conduct periodical inspections in order to confirm long-term integrity.



Sectional view of Reactor Building

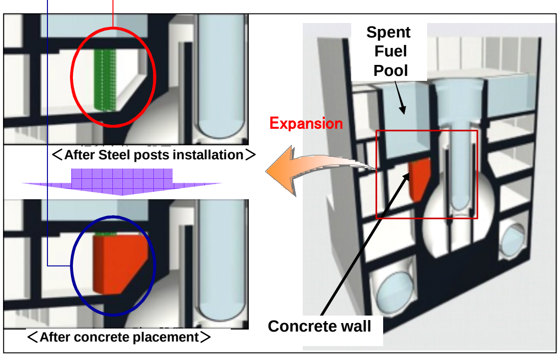
Modeling

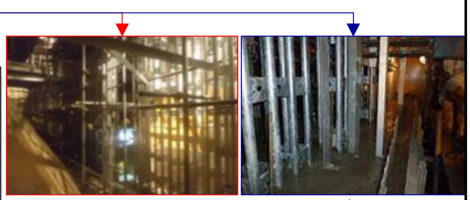


FEM Analysis Model considering wall damage

【7】Countermeasures against Aftershocks and Tsunami

- ➢We installed a support structure at the bottom of the spent fuel pool of Unit 4. This increased the seismic safety margin by an extra 20 %.
- ➢Installed a temporary tide barrier (OP+14m) as a countermeasure against tsunamis. (6/30/2011)





Steel posts installed condition （6/20/2011）

concrete placement condition （7/21/2011）

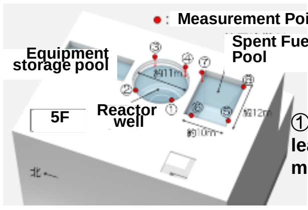
Overview of temporary tide barrier Installation

【8】 Integrity Confirmation of Unit 4 Reactor Building

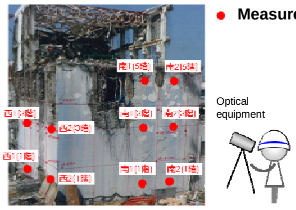
- In accord with indications that Unit 4 R/B was leaning, we conducted inspections as shown below. And **we confirmed that the building was not leaning and its structural integrity had been maintained.** (In May and August 2012)

We continue to conduct periodical inspections continuously. (4 times per year)。

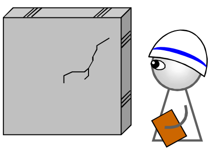
- ✓Inspection①： confirmation of leaning（water level measurement）
- ✓Inspection②：confirmation of leaning（outer wall measurement）
- ✓Inspection③：Visual Inspection（ cracks on the concrete floor and walls ）
- ✓Inspection④： Concrete Strength Verification （ non-destructive inspection ）



①confirmation of leaning（water level measurement）



② confirmation of leaning（outer wall measurement）



③ Visual Inspection（ cracks on the concrete floor and walls ）

④ Concrete Strength Verification （ non-destructive inspection ）

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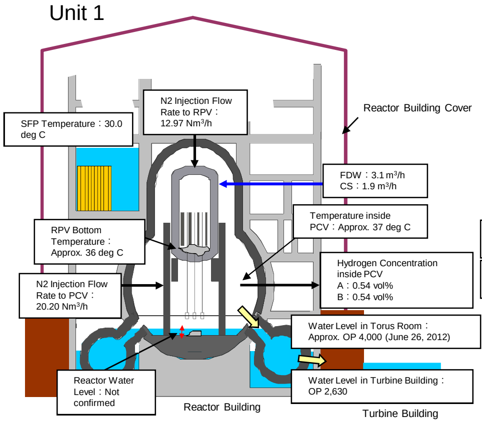
【9】 Approach for monitoring the reactors and removing fuel debris

(Unit 1)

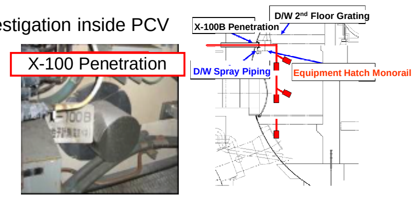
- **We are going to investigate internal state of the PCV via inserting survey equipment** in order to obtain photos and to directly measure data; ambient temperatures, radiation dose rate, accumulated water temperatures, water level, sampling and analysis of the water ,etc. (October 2012).
- **Investigation and repair of the PCV leakage is being considered. Inside of Torus Room was investigated by CCD camera inserted via penetration on the 1st floor of the Reactor Building (June 26, 2012).**

Unit 1

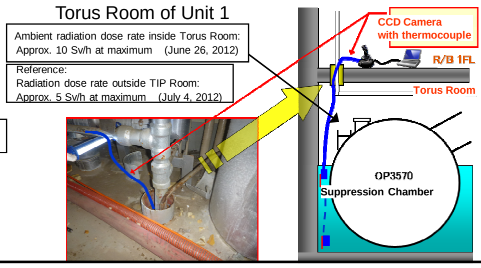


*Parameters as of Sep. 5, 2012 11:00AM

Investigation inside PCV



Torus Room of Unit 1



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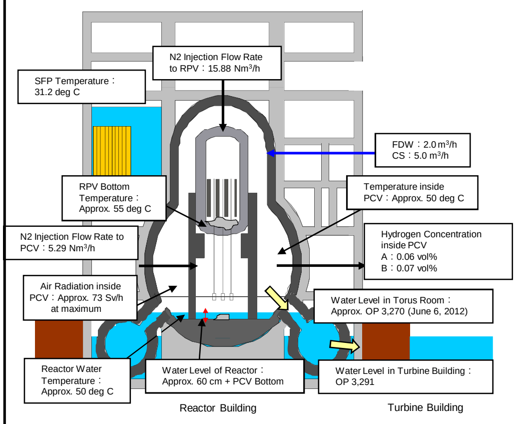
【9】 Approach for monitoring the reactors and removing fuel debris

(Unit 2)

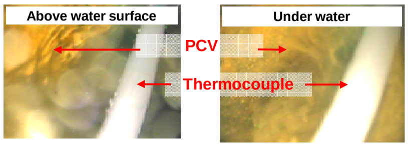
- **Investigation inside was carried out** with microscopes etc. via PCV penetration. (January 19 and March 26 & 27, 2012)
- **Investigation inside Torus Room was carried out with robots** (April 18, 2012).
  Water level was measured inside Torus Room and staircases area (June 6 and 28, 2012).

Unit 2

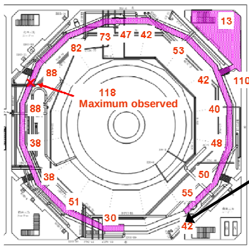


※Parameters as of Sep. 5, 2012 11:00AM

Investigation inside the PCV



Investigation inside Unit 2 Torus (April 18)



S/C Manhole (Southeast)

Red : Radiation (mSv/h)

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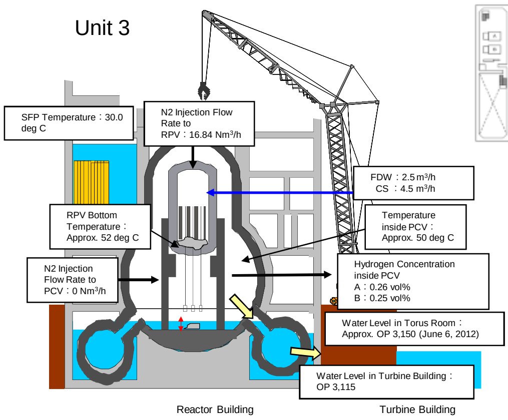
(Unit 3)

- **Work Environment was investigated by robots in TIP room on 1st floor of the Reactor Building** for preparation to investigate inside the PCV. (May 23, 2012)
- **Survey the Torus Room by robots** to understand conditions inside it.（July 11/2012）
  Water level was measured inside Torus Room and staircases area (June 6, 2012).

Unit 3



*Parameters as of Sep. 5, 2012 11:00 AM

Unit 3 Torus Investigation（7/11）

South-east manhole

PCV side condition

Water Level Survey in Torus and staircases area of Unit 3

Unit 3 staircases area (Northwest)

Water level	Unit 3
Staircases area	OP 3150
Torus Room	OP 3370

Measured water level of accumulated water

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