February 27, 2014

Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment

Progress Status and Future Challenges of the Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station Units 1-4 (Outline)

Progress status

◆ The temperatures of the Reactor Pressure Vessel (RPV) bottom and the Primary Containment Vessel (PCV) gas phase of Units 1-3 have been maintained within the range of approx. 15 to 35°C*1 for the past month. There was no significant change in the density of radioactive materials newly released from Reactor Buildings in the air*2. It was evaluated that the comprehensive cold shutdown condition was maintained*3.

*1 The values vary somewhat depending on the unit and location of the thermometer.

*2 The radiation exposure dose due to the current release of radioactive materials from the Reactor Buildings peaked at 0.03 mSv/year at the site boundaries. This is approx. 1/70 of the annual radiation dose by natural radiation (annual average in Japan: approx. 2.1 mSv/year).

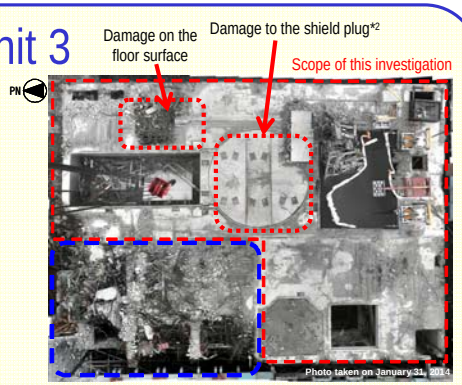
*3 Though water injection amount to Units 2 and 3 has been reduced from January to February, it was evaluated that the stable cooling has been maintained. (Water injection amount to Units 1 to 3: Approx. 400m³/day → approx. 320m³/day)

◆ Fuel removal from the Unit 4 spent fuel pool commenced on November 18. As of February 26, 374 spent fuel assemblies and 22 non-irradiated fuel assemblies had been transferred to the common pool.

Structure investigation of the Unit 3 reactor building

Prior to installing the fuel removal cover, structure of the reactor building was investigated with using a camera mounted on the crane. The investigation found some partial damages on the operating floor surface*1 but no significant damage. For the next step, seismic assessment of the reactor building will be implemented based on the investigation result.

*1 Operating floor:
The floor where replacement of fuel in RPV and inspection of reactor inside is implemented with open reactor lid during the periodical inspection.
*2 Shield plug:
Concrete material which is installed on the top of the reactor to shield radiation from the reactor during operation.



Confirmed by the status investigation immediately after the earthquake

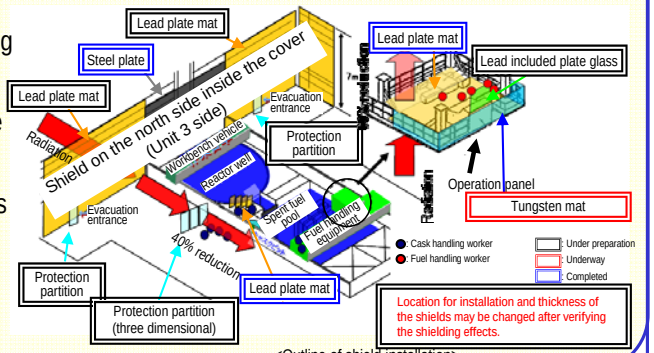
* Full view produced by integrated photos of investigation

<Investigative result of operation floor>

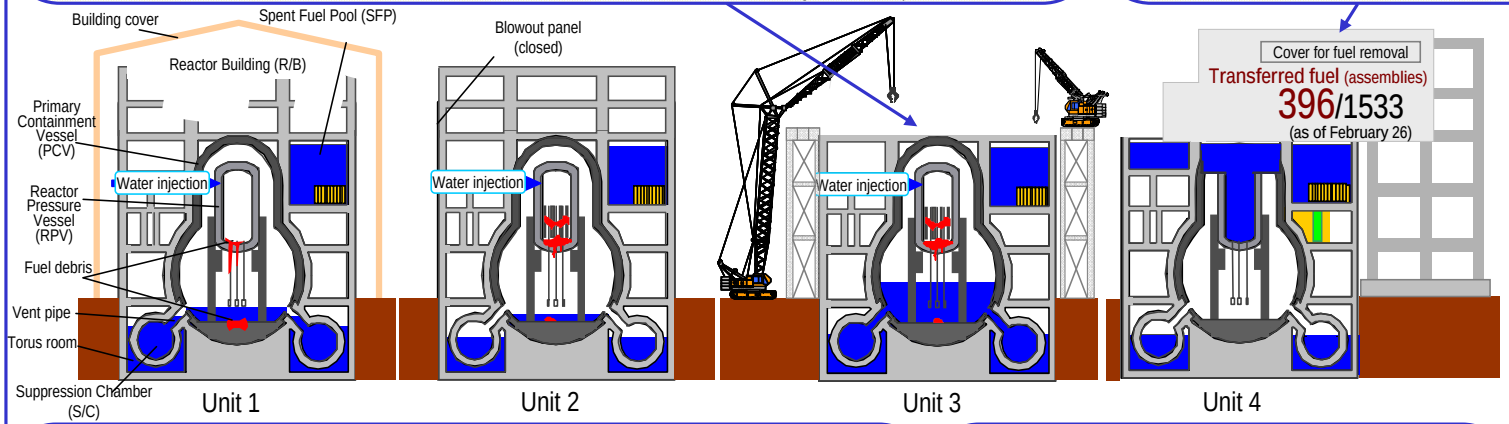
Dose reduction for fuel removal work in Unit 4

Shields are installed on fuel-handling system in order to reduce the radiation dose of workers for fuel removal in Unit 4 to one-third by the end of March 2014.

Since the dose impact from Unit 3 is significant, shields will be installed over the entire cover surface of its Unit 3 side.



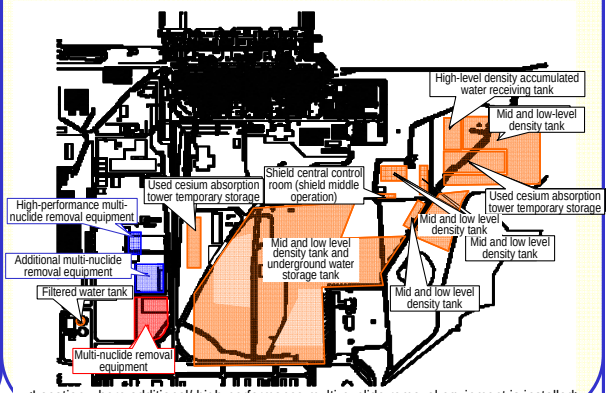
<Outline of shield installation>



Enhancement of Multi-nuclide Removal Equipment

For early completion of treating contaminated water * stored within the site (as of February 25, approx. 340,000 tons was stored), additional multi-nuclide removal equipment (improved based on operational experience with the existing one) and high-performance multi-nuclide removal equipment (developed by the METI project) will be installed.
Site preparation work will begin in March for installation of the equipment.

* Contaminated water (RO concentrated salt water):
The water removed cesium from accumulated water in the buildings and concentrated by reverse osmosis (RO) device.

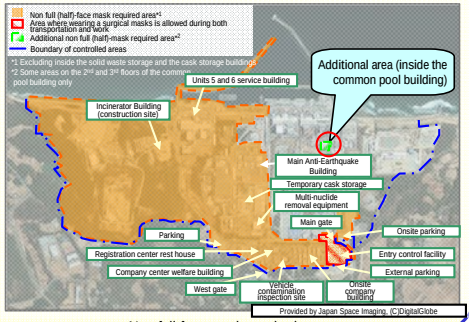


<Location where additional/ high-performance multi-nuclide removal equipment is installed>

Expansion of non full-face mask required area

To reduce the burden on workers and improve productivity, the areas where a full-face mask isn't required are increasing step by step.

After verifying the density of radioactive materials in the air, some areas on the 2nd and 3rd floors in the common pool building will become non full-face mask required area (start from March 10).



< Non full-face mask required area >

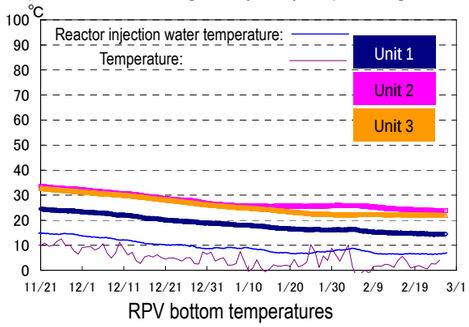
Fukushima Advisory Board on Decommissioning and Contaminated Water Management

To hear the opinions of related local parties about the approach to decommissioning, information provision and public relations activities, as well as examining an approach to future decommissioning measures, the Fukushima Advisory Board was established. Several valuable opinions about improvement of communication, decommissioning and contaminated water issue were expressed at the 1st meeting on February 17.

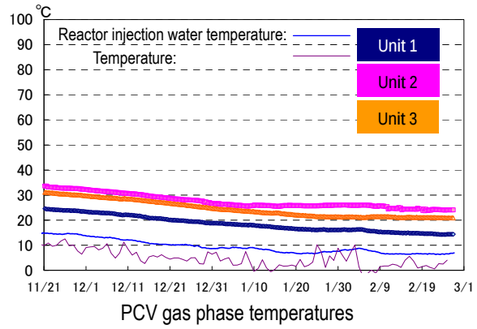
I. Confirmation of the reactor conditions

1. Temperatures inside the reactors

Through continuous reactor cooling by water injection, the temperatures of the Reactor Pressure Vessel (RPV) bottom and the Primary Containment Vessel (PCV) gas phase have been maintained within the range of approx. 15 to 35℃ for the past month, though they vary depending on the unit and location of the thermometer.



RPV bottom temperatures



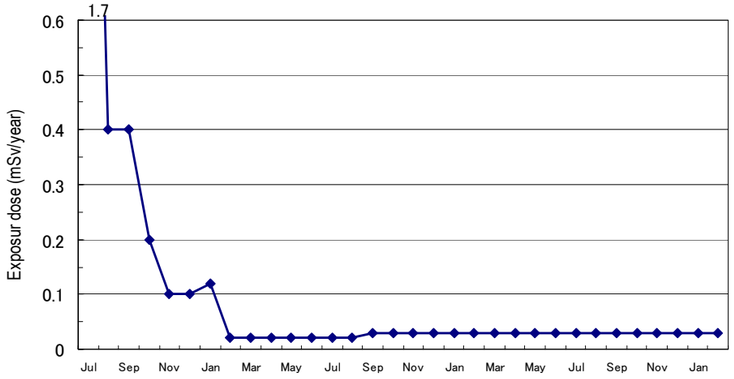
PCV gas phase temperatures

* The trend graphs show part of the temperature data measured at multiple points.

2. Release of radioactive materials from the Reactor Buildings

The density of radioactive materials newly released from Reactor Building Units 1-4 in the air measured on-site boundaries was evaluated at approx. 1.5 x 10^{-9} Bq/cm^3 for both Cs-134 and -137. The radiation exposure dose due to the release of radioactive materials was 0.03 mSv/year (equivalent to approx. 1/70 of the annual radiation dose by natural radiation (annual average in Japan: approx. 2.1 mSv/year)) at the site boundaries.

Annual radiation dose at site boundaries by radioactive materials (cesium) released from Reactor Building Units 1-4



(Reference)
* The density limit of radioactive materials in the air outside the surrounding monitoring area:
[Cs-134]: 2 x 10^{-5} Bq/cm^3
[Cs-137]: 3 x 10^{-5} Bq/cm^3
* Dust density around the site boundaries of Fukushima Daiichi Nuclear Power Station (actual measured value):
[Cs-134]: ND (Detection limit: approx. 1 x 10^{-7} Bq/cm^3)
[Cs-137]: ND (Detection limit: approx. 2 x 10^{-7} Bq/cm^3)

(Note) Different formulas and coefficients had been used to evaluate the radiation dose in the facility operation plan and monthly report. The evaluation methods were integrated in September 2012. As the fuel removal from the spent fuel pool (SFP) commenced for Unit 4, the radiation exposure dose from Unit 4 has been added to the items subject to evaluation since November 2013

3. Other indices

There was no significant change in indices, including the pressure in the PCV and the PCV radioactivity density (Xe-135) for monitoring criticality, nor was any abnormality of cold shutdown condition or sign of criticality detected. Based on the above, it was confirmed that the comprehensive cold shutdown condition had been maintained and the reactors remained in a stabilized condition.

II. Progress status by each plan

1. Reactor cooling plan

The cold shutdown condition will be maintained by cooling the reactor by water injection and measures to complement status monitoring will continue to be implemented

➢ Reduction in Unit 3 reactor injection water

- Aiming to reduce the burden on the water treatment facilities, the amount of water injected into the Unit 3 reactor was reduced by 1.0m^3/h to 4.5m^3/h (as of February 12). It was evaluated that following the change in water injection amount, stable cooling had been maintained.

2. Accumulated water treatment plan

To deal with the increase in accumulated water due to groundwater inflow, fundamental measures to prevent groundwater from flowing into the Reactor Buildings will be implemented while improving the decontamination capability of the water treatment facilities and preparing facilities to control the contaminated water

➢ Preventing groundwater inflow to the Reactor Buildings

- At the groundwater bypass pumping well Nos. 5 to 12, gross β and tritium densities are continuously measured. No major variation was detected.
- Toward the installation of the sub-drain facility (by the end of September), drilling in seven of 13 new pits was completed as of February 26. For building the sub-drain treatment facility, land drilling was completed and the base concrete placement will begin from February 27.
- Toward the installation of frozen impermeable wall surrounding Units 1 to 4, the demonstration was conducted at the site. At present installation of frozen ducts is underway and freezing operation will begin around early March.

➢ Operation of the multi-nuclide removal equipment

- Hot tests using radioactive water are in operation (System A: from March 30, System B: from June 13, System C: from September 27). To date, approx. 56,000 m^3 has been treated (as of February 25).
- System A continues operation except for the suspension period for filter cleaning (from January 30 to February 1). As the pump for transfer to the absorption vessel was suspended, System A was shifted to standby operation (February 26). Since January 24, in response to the detection of four radioactive nuclides (except tritium) such as iodine 129 in the treated water, measures to improve performance with actual equipment using activated carbon adsorbent have been implemented (until mid-March).
- System B was suspended from January 24 to February 12 to verify the effectiveness of anti-corrosion measures. The effectiveness of the measurements was confirmed. In future, inspection will be conducted as required.
- System C is suspended for filter cleaning (from February 1 to 3, from February 25 to February 27 (planned)). In late March, System C will be suspended to verify the effectiveness of 2nd anti-corrosion measures.
- For the early completion of treating RO concentrated salt water stored in Fukushima Daiichi Nuclear Power Station, additional multi-nuclide removal equipment (improved based on operational experience with the existing one; the application of the implementation plan was submitted on February 12) and high-performance multi-nuclide removal equipment (developed by the subsidiary project of the Ministry of Economy, Trade and Industry) will be installed. Site preparation work for installation of the equipment will begin in March and the foundation construction will be conducted consecutively.
- Mobile strontium removal equipment is installed to reduce Strontium 90 contained in the contaminated water. This measure aims to reduce the risks of leakage, the radiation dose on the site boundaries, and the radiation dose of workers for patrol.

➢ Troubles and measures in the Tank Area

- During the patrol, a leak was detected from the strainer differential manometer installed for the freshwater transfer pipes for reactor water injection (February 6). It was estimated that the leak occurred from the differential manometer's bonnet because of freezing. Soil from the leak point was collected (February 6 and 7). For similar measuring gauges installed outdoor, anti-freezing measures have already been implemented.
- During the tank patrol, cracks were detected in the concrete foundation in the H4 and H4 East Tank Areas (February 11). In addition to repairing the relevant cracks by applying epoxy paint, it is planned to early complete coating inside the fences by urethane paint, which is currently underway (by early March).
- During the tank patrol, a leak was detected from the fences of the H5 Tank Area (at the pipe penetration, and the connection between concrete fences and steel fences) (February 16). The relevant points were repaired by sealing. Pipe penetrations elsewhere were inspected and repaired as required. For the connection between concrete and steel fences, after identifying the cause of any leak, repairs will be conducted.
- During the tank patrol, a leak was detected from the flange of the tank top in the H6 Area, and approx. 100m^3 was flowing along the rain gutter to outside the fences. (February 19). Later, the leak was stopped by reducing the water level of the relevant tank (February 20). It was estimated that the leak was caused by water inflow into the tank because the valve leading to the pipes for transferring to the H6 Tank Area was opened when RO concentrated salt water was transferred to the Tank E Area after treatment by the desalination equipment (RO). The cause of the opening of the relevant valve is currently under investigation.
- To prevent inflow from any leak of contaminated water from a tank to the drainage area, the drainage area was covered (completed on February 22).

➢ Treatment and removal of contaminated water from the Main Trenches

- As for the Main Trench Units 2 and 3, treatment of contaminated water using the mobile treatment equipment is underway (Unit 2: from November 14, Unit 3: from November 15).
- Toward the removal of contaminated water from June, drilling and installation of frozen ducts are underway (Unit 2: commenced in December 2013 and scheduled for completion by end May 2014 (completed 6/48 ducts), Unit 3: from March to June 2014).

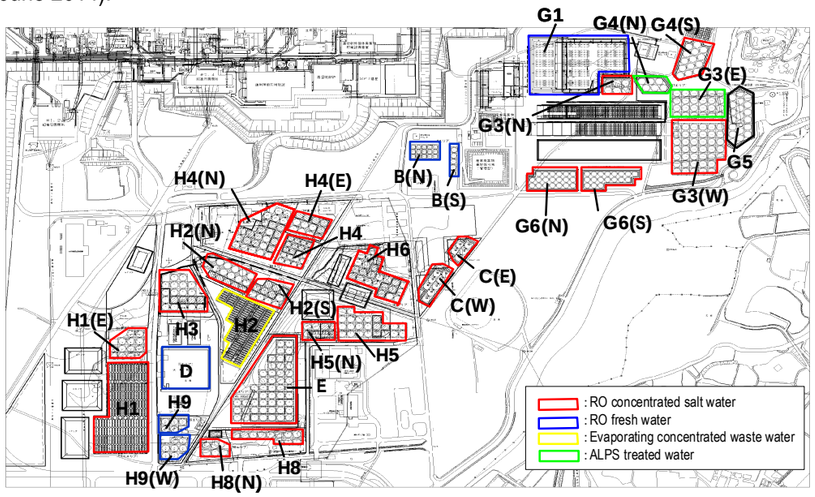


Figure 1: Layout of Tank Area

3. Plan to reduce radiation dose and mitigate contamination

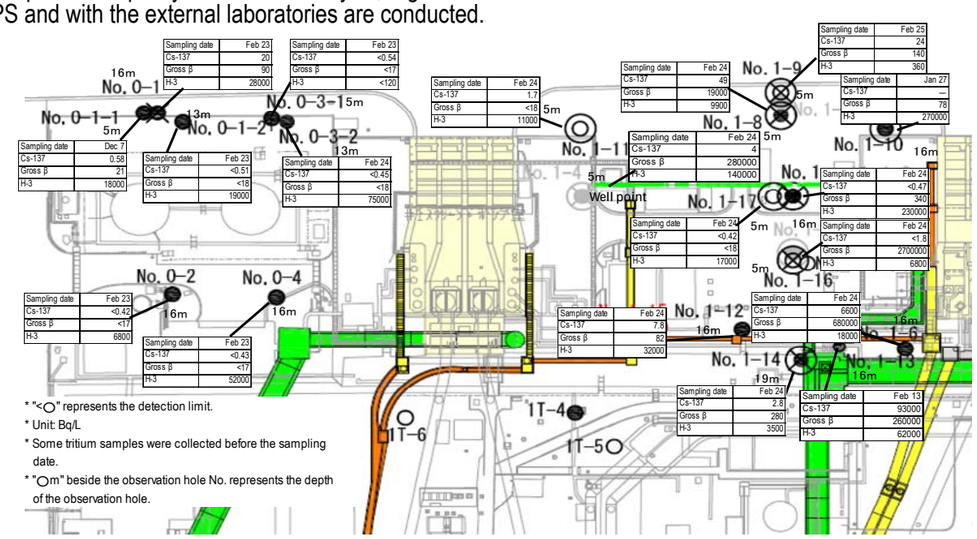
Effective dose-reduction at site boundaries (reduced 1 mSv/year by the end of FY 2012) and purification of the water in the port to mitigate the impact of radiation on the outside environment

➢ Status of groundwater and seawater on the east side of Units 1 to 4 Turbine Buildings

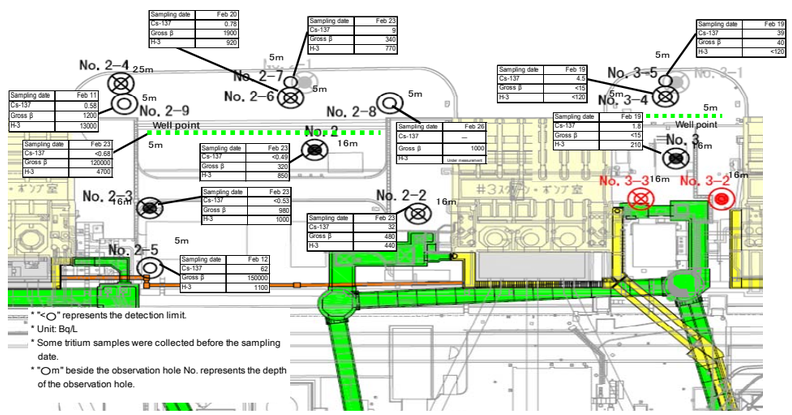
- Regarding the groundwater near the bank on the north side of the Unit 1 intake, a high density of tritium (approx. 10^5Bq/L) was detected in the lower layer (sandstone bed). Though 1 m^3/day of water has been pumped up from Observation Hole No. 0-3-2 (from December 11-13 and December 16, ongoing), no decrease was confirmed.
- Regarding the groundwater near the bank between the Unit 1 and 2 intakes, water pumping from the well point continues (45 m^3/day). The gross β radioactive material density is maintained at 10^6 Bq/L at groundwater Observation Hole No. 1-16. The tritium density at the groundwater Observation Hole No. 1-10 is approx. 10^5Bq/L, almost equivalent to that at groundwater Observation Hole No. 1. At groundwater Observation Hole Nos. 1-6 and 1-13, the gross β radioactive material density is 10^5Bq/L near the power supply line. At the groundwater Observation Hole No. 1-13, the cesium density is 10^5Bq/L, the highest in the groundwater near the bank between the Unit 1 and 2 intakes.
- Regarding the groundwater near the bank between Units 2 and 3, the amount of water pumped in from the north side of the well point has been increased from 2 to 4 m^3/day since February 14. The gross β radioactive material density at the groundwater Observation Hole No. 2-7, which increased in early January, is maintained at around 10^2Bq/L. At the groundwater Observation Hole No. 2-9, the tritium density is 10^4Bq/L, the highest in groundwater near the bank between the Unit 2 and 3 intakes.
- Regarding the groundwater near the bank between the Unit 3 and 4 intakes, the density of radioactive materials is maintained at low levels at all Observation Holes.
- Within the port, no significant change in the radioactive material density of seawater was detected in recent data for the past month, nor any significant increase in offshore measurement results, as was the case a month ago.
- To prevent the spread of contaminated soil and sand, the sea bed within the port will be covered (coverage is scheduled for commencement in April 2014).

➢ Measurement results of gross β and strontium 90

- As some measurement results showed strontium 90 density data was higher than the gross β , the cause analysis was conducted. The analysis identified that the cause of this phenomenon was an incorrectly configured detection rate for the measurement equipment in the Unit 5 and 6 hot laboratories.
- Some samples which showed strontium 90 density was higher than the gross β were detected. This was considered to be attributable to the "counting loss effect", which occurs with the measuring high-density samples, in some measurement equipment.
- The measurement equipment in the Unit 5 and 6 hot laboratories will not conduct analysis on strontium 90 until its re-calibration.
- Regarding 164 samples which may include "counting loss effect," correction will be made by considering the "count loss effect."
- To improve the quality of radiation analysis, regular cross checks between laboratories at the Fukushima Daiichi NPS and with the external laboratories are conducted.

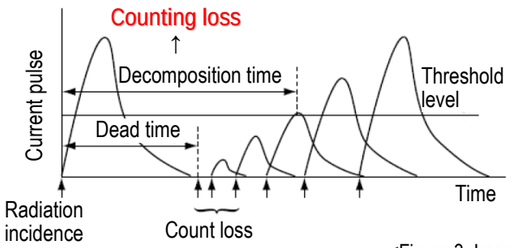


<Unit 1 intake north side, between Unit 1 and 2 intakes>



<Between Unit 2 and 3 intakes, between Unit 3 and 4 intakes>

Figure 2: Groundwater density on the Turbine Building east side



Counting loss

Phenomenon where radiation incidence is not counted

Dead time

Time when the detection equipment does not respond to any radiation incidence

Decomposition time

Time from when the radiation incidence is recognized as a current signal to when it is counted

<Figure 3: Image of count loss>

4. Plan to remove fuel from the spent fuel pools

Work toward removing spent fuel from the pool is steadily progressing while ensuring seismic capacity and safety. The removal of spent fuel from the Unit 4 pool commenced on November 18, 2013 and efforts are being made to complete the process by around the end of 2014

➢ Fuel removal from the Unit 4 spent fuel pool

- Duel removal from the spent fuel pool (SFP) commenced on November 18, 2013.
- As of the end of work on February 26, 374 of 1331 spent fuel assemblies and 22 of 202 non-irradiated fuel assemblies had been transferred to the common pool.
- During work on measures to prevent groundwater inflow to the building, the buried power source cable was damaged (February 25). Due to this incident, the Unit 4 spent fuel pool circulating cooling facility (secondary system) was suspended. On the same day, the power receiving source was changed, and the cooling facility was resumed. The fuel removal work was also temporarily suspended, but resumed the same day.
- To reduce the radiation dose during the fuel removal work, the cover for fuel removal on the north (Unit 3) side and shields for the fuel-handling equipment are being installed (scheduled for completion by end March).

➢ Main works toward removing spent fuel at Unit 3

- The removal of rubble such as steel, deck plates, and roof torus is conducted. The next step will involve the scheduled removal of masts and fuel exchangers.
- Measures to reduce the radiation dose (decontamination and shielding) on the operating floor are underway (commenced on October 15). A deficit was confirmed with some devices of the self-traveling decontamination equipment in December 2013 during the test operation. After investigating the cause and countermeasures, the system was re-installed on the 1st floor and the absorption work was resumed on February 24.
- Before installing a fuel-removal cover, the structure of the Reactor Building was investigated (from December 19 and competed on January 31) following the removal of rubble from the operating floor. Though damage was detected to some parts of the operating floor surface and shield plug, no significant damage was detected elsewhere. The next step will involve the scheduled seismic safety evaluation based on these circumstances.

5. Fuel debris removal plan

In addition to decontamination and shield installation to improve accessibility to the PCV, technology was developed and data gathered as required to prepare for removing fuel debris (such as investigating and repairing PCV leak locations)

➢ Contamination status survey and decontamination of Reactor Building Units 1 to 3

- To check for any infiltration of contamination into the building concrete on the south side of the Reactor Building Unit 1 1st floor, the floor surface will be excavated to collect samples (February 6), which are currently being analyzed and based on the analytical results, the decontamination method will be examined.
- Toward the contamination distribution survey on the Reactor Building Unit 2 5th floor (operating floor); drilling was conducted on the roof to insert investigation equipment from there (completed on February 1). Samples of the operating roof collected during the drilling are currently being analyzed to identify detailed contamination conditions.

➢ Policy for investigation of the Primary Containment Vessel (PCV)

- Prior to fuel debris removal, to check the conditions inside the Primary Containment Vessel (PCV), a policy for investigation inside the PCV of each Unit was formulated.
- The water stoppage method for the bottom of the PCV is examined by the national project. Future investigation plans are formulated toward confirming a water stoppage method for the bottom of the PCV in FY2016.

6. Plan to store, process and dispose of solid waste and decommission reactor facilities

Promoting efforts to reduce and appropriately store waste generated and R&D toward adequate and safe storage, processing and disposal of radioactive waste

➢ Status of management of rubble and trimmed trees

- As of the end of January the total storage volume of concrete and metal rubble was approx. 70,000 m^3 (area occupation rate: 71%). The total storage volume of trimmed trees was approx. 78,000 m^3 (area occupation rate: 60%).

➢ Status of management of secondary waste from water treatment

- As of February 25, the total storage volume of waste sludge was 597 m^3 (area occupation rate: 85%). The total storage number of spent vessels was 796 (area occupation rate: 32%).

➢ Radioactivity analysis of trees sampled within the Fukushima Daiichi Nuclear Power Station

- Toward examination on means of processing and disposing of the accident waste, radioactivity analysis is conducted on the tree samples collected across the power station site.

7. Plan for staffing and ensuring work safety

Securing appropriate staff for the long-term while thoroughly implementing workers' exposure dose control. Improving the work environment and labor conditions continuously based on an understanding of workers' on-site needs

➢ Staff management

- The monthly average number of people registered for at least one day per month to work on-site during the past quarter from October to December, 2013 was approx. 8,700 (TEPCO and partner company workers), which exceeds the monthly average number of workers (approx. 6,600). Accordingly, sufficient people are registered to work on-site.
- It was confirmed that the estimated manpower necessary for the work in March (approx. 3,790 per day: TEPCO and partner company workers)* would be secured. The average numbers of workers per day for each month of this fiscal year (actual value) are as shown in the figure below, with approx. 3,000 to 3,700 per month (See Figure 4).

* Workers with whom contract procedures have not yet been completed are excluded from the total for each month.

- As of January, the local employment ratio (TEPCO and partner company workers) was approx. 50%.

➢ Expansion of non full-face mask required area

- As it was confirmed that the density of radioactive materials in air was under the level for non full-face mask required area (particle Cs; $2\times10^{-4}Bq/cm^3$) in some parts on the 2nd and 3rd floors of the common pool building, these areas will be set as non full-face mask required area to reduce the burden on workers and improve productivity (scheduled for commencement on March 10).

➢ Efforts to improve the labor environment

- The location of the Administration Office Building was determined (on the west side of the entry control facility).
- Seminars related to ensuring appropriate labor conditions were conducted with invited lecturers from the Fukushima Labour Standards Bureau (February 4, 18, 25).
- Removal of scrapped automobiles is underway (22 out of 25 automobiles removed) (scheduled for completion by June 2014).

➢ Outbreak status of influenza and norovirus

- As of February 21, 134 persons were infected with influenza and 26 persons, with norovirus. Thorough infection-control measures will be continued. (Accumulated totals last year were 204 for influenza and 37 for norovirus patients).

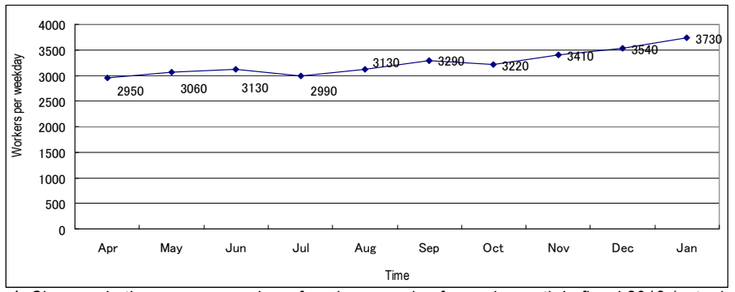


Figure 4: Changes in the average number of workers per day for each month in fiscal 2013 (actual values)

8. Others

➢ Fukushima Advisory Board on Decommissioning and Contaminated Water Management

- To hear the opinions of related local parties about the approach to decommissioning, information provision and public relations activities, as well as examining an approach to future decommissioning measures, the Fukushima Advisory Board was established.
- Several valuable opinions about improvement of communication, decommissioning and contaminated water issue were expressed at the 1st meeting on February 17.

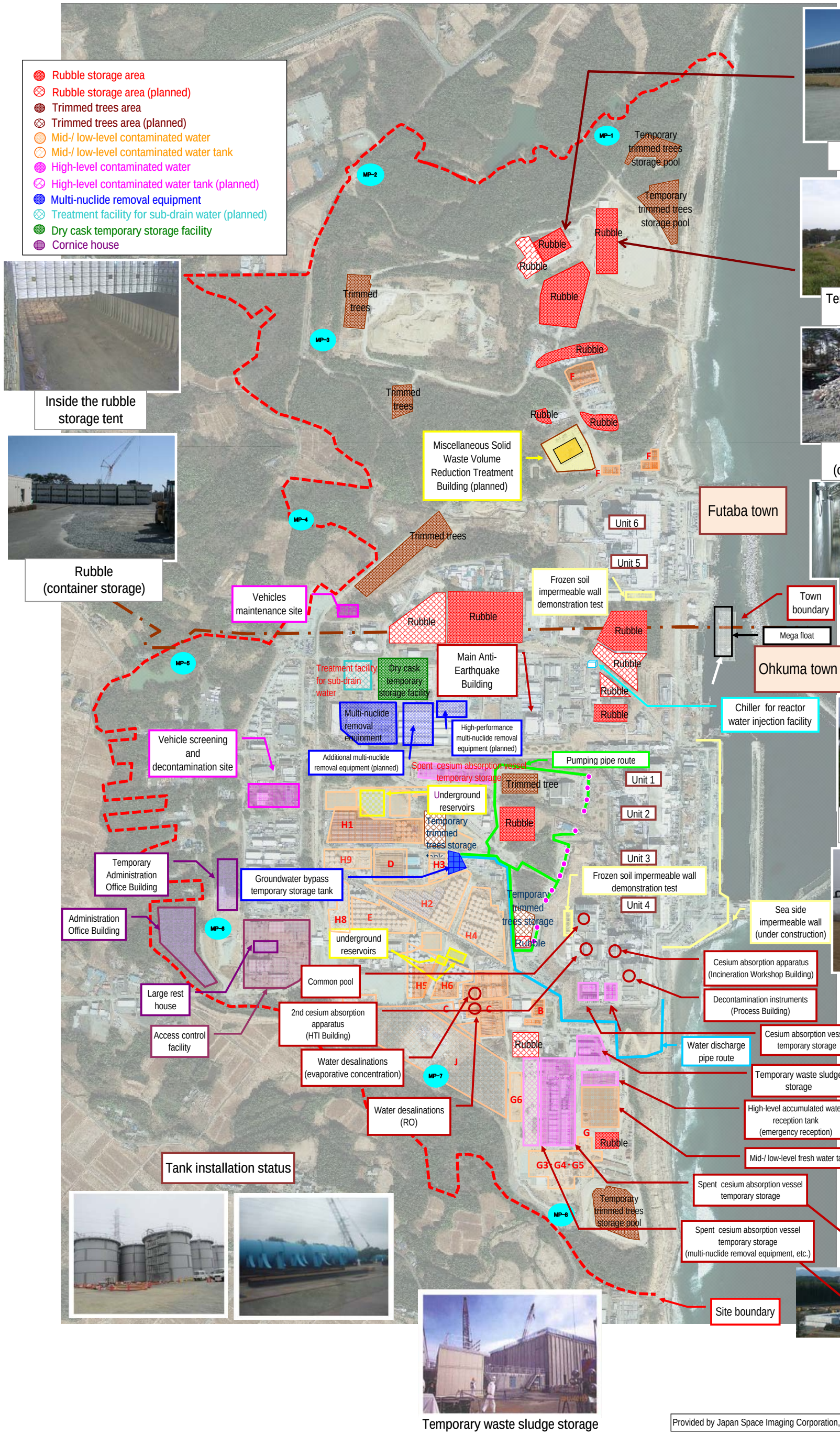
➢ Effort to share information with the international society

- The final report of the IAEA decommissioning mission (from November 25 to December 4, 2013) was published together with the IAEA on February 13. The report recognizes Japan's proactive attitude and approach towards addressing the many difficulties at the site following the incidents related to contaminated water.
- The Government of Japan started to provide to IAEA relevant information on a regular basis to share it with the international society through the IAEA. The information is uploaded on the IAEA's webpage together with IAEA's assessment on Japan's efforts.

Appendix 1

February 27, 2014

TEPCO Fukushima Daiichi Nuclear Power Station Site Layout



Status of efforts on various plans (Part 1)

Attachment 2

: Main processes
: Sub-main processes

: Field work
: R&D
: Review
:Plan until last month
Green frame: Change from last month

As of **February 27, 2014**

Challenges	Phase 1 (no later than 2 years after the completion of the current efforts)	Phase 2 (Early period)
	2012 / 2013	2014 / 2015

Reactor cooling plan

- Maintenance and monitoring of the cold shut down condition of nuclear reactor (by continuous monitoring on the continuation of water injection and parameters including temperature etc., preservation and improvement of reliability through maintenance and management)
- Narrowing-down of candidate systems for inserting alternative thermometer in Unit 1 RPV
- Review on the method for inserting alternative thermometer in Unit 1 RPV*
  *The time for executing the installation work will be determined after on-site studies etc., on the basis of the status of environmental improvement by means of decontamination/shielding.
- Installation of thermometer in Unit 2 RPV (including inspection in nuclear reactors)
- Narrowing-down of candidate systems for inserting alternative thermometer in Unit 3 RPV
- Review on the method for inserting alternative thermometer in Unit 3 RPV*
- Partial observation of the PCV
- Remote visual check of the PCV, direct measurement/evaluation of temperature etc.
- •Objective: Completion of switching to the equipment for water intake from the reactor building (or from the bottom of the PCV)
- Improvement of the reliability of the circulating water injection cooling system (water intake from the turbine building) (Review/implement measures to strengthen some materials for pipes, etc./improve earthquake resistance)
- Water source: Treated water buffer tank
- Water source: Condensate water storage tank for Units 1 to 3
- Reliability improvement measures for the lines taking water supplies from the condensate water storage tanks of Units 1 to 3
- The circulating injection cooling system (water intake from the reactor building (or the lower part of the reactor containment vessel))
- Review on water take from reactor building (or from the bottom of the PCV) - Construction work
- Switching among the water intake equipment (sequential)
- Inspection/review for early construction of the circulation loop in the building
- Construction of circulation loop in the building (for Units 1 to 3)

Plan for retrieving fuel from spent fuel pool

Unit 1

- Review on fuel removing method
- **HP 1-1** Selection of a fuel/fuel debris removing plan
- Dismantling of building cover
- Removal of debris, decontamination and shielding
- Modification/recovery of building cover
- Pool circulation cooling (preservation/improvement of reliability by maintenance management and facility update etc.)

Unit 2

- Consideration/preparation for the decontamination and shielding in the building
- **HP 2-1** Selection of a fuel/fuel debris removing plan
- Decontamination/shielding, restoration of fuel handling equipment
- * Reviewed based on the progress status in the field
- Pool circulation cooling (preservation/improvement of reliability by maintenance management and facility update etc.)

Unit 3

- Preparatory work/debris removing work
- Removal of debris, decontamination and shielding in the pool
- Construction of fuel removal cover/installation of fuel handling equipment
- **HP 3-1** Selection of a fuel/fuel debris removing plan
- Removal of debris In the pool/fuel check
- Design and manufacturing of fuel removal cover
- Design and manufacturing of crane/fuel handling machines
- Consideration, design and manufacturing of on-site shipping containers
- Fuel removal
- Pool circulation cooling (preservation/improvement of reliability by maintenance management and facility update etc.)

Unit 4

- Construction of fuel removal cover/installation of fuel handling equipment
- * Reviewed based on the progress status in the field
- Removal of debris In the pool/fuel check etc.
- Fuel removal
- Pool circulation cooling (preservation/improvement of reliability by maintenance management and facility update etc.)

Status of efforts on various plans (Part 2)

: Main processes
: Sub-main processes

: Field work
: R&D
: Review
:Plan until last month
Green frame: Change from last month

As of **February 27, 2014**

Challenges	Phase 1 (no later than 2 years after the completion of the current efforts)		Phase 2 (Early period)	
	2012	2013	2014	2015

Fuel debris removal plan

Decontamination of the inside of the building
- Review on decontamination technology/development of remote decontamination equipment
- Development of remote contamination investigation technologies (1)
- Development of remote decontamination technologies (1)
- Site survey and on-site demonstration
- ・Objective: Establish decontamination robot technology
- Decontamination, shielding, etc. in the building (Work environment improvement (1))
- First floor of the reactor building
- 2nd and upper floors of the reactor building
- To be continued

Measures to reduce overall dose
- Formulation of a comprehensive plan for exposure reduction
- Grasping of the situation of work area
- Formulation of work plan in the reactor building
- Formulation of work plan on the floor with damage from explosion

Inspection/repair of leaking locations of the PCV
- R&D for inspection/repair of leaking locations of the PCV (including stop leakage between buildings).
- Design, manufacturing and testing etc. of the equipment for inspecting the PCV (2)
- Design, manufacturing and testing etc. of the equipment for inspecting the PCV (3), (6)
- [Units 1 and 3] Inspection of the basement of the nuclear reactor building, Inspection of leaking locations☆
- [Unit 2] Inspection of the basement of the nuclear reactor building, Inspection of leaking locations☆
- ☆: Including on-site demonstration

Fuel debris removal
- R&D toward the removal of fuel debris (to be continued to address long-term challenges including internal R&D of equipment etc.)
- Design, manufacturing and testing etc. of the equipment for inspecting the inside of the PCV (5)
- Inspection from outside the PCV (including on-site demonstration of development results)

Stable storage, processing/disposal of fuel debris after removal
- Development of storage cans (surveys on existing technologies, review on storage systems/development of safety evaluation technique etc.)
- Research on/development of mock-up processing/disposal technologies
- Establishment of nuclear material accountancy and control measures for the fuel debris

Others
- Development of criticality evaluation and detection technologies

Status of efforts on various plans (Part 3)

: Main processes
: Sub-main processes

: Field work
: R&D
: Review
:Plan until last month
Green frame: Change from last month

▼As of **February 27, 2014**

Challenges	The Phase 1 (no later than 2 years after the completion of the current efforts)		The Phase 2 (Early period)	
	2012	2013	2014	2015

Plan for maintaining and continuing the steady state of plant

Retained water treatment plan

- Objective: Implement the measures to improve the reliability of the current facilities
- Retained water treatment by means of existing treatment facilities
- Improving the reliability of the current facilities, etc. (improve the reliability of transfer, processing, and storage facilities).
- Treatment of retained water by water treatment facilities with improved reliability
- Replacement of branch pipe pressure hoses with PE pipes
- Measures to prevent the expansion of tank leakage (Reinforced concrete dam/embankment/replacement by closed conduits), to be taken sequentially along with the installation of tanks
- Consideration of reducing the circular lines
- Review on sub-drain recovery methods
- Sub-drain restoration work
- Restore sub-drain facilities, reduce the amount of groundwater inflow (reduction in retained water)
- Review on sub-drain and other purification facility ⟶ Installation work
- Drawdown of groundwater in the building
- Groundwater bypass installation work
- Groundwater inflow is reduced (Retained water is decreased).
- Installation of multi-nuclide removal equipment
- Consider and implement measures to increase the processing amount
- Purification of on-site reservoir water
- Preparation work for frozen soil impermeable walls
- Installation work
- Reduce groundwater inflow rate (Reduce accumulated water)

Plan for preventing the spread of marine pollution

- Construction of sea side water barrier wall
- Landfilling etc. in the harbor area
- Installation of steel pipe sheet pile
- * Reviewed based on the progress status in the field
- ▪Objective: Reduction of the concentration of radioactive substances contained in the seawater of the harbor (to less than the notified concentration)
- Consideration of technologies for decontaminating radioactive strontium (Sr)
- Seawater circulation purification
- Sea water purification by fibrous adsorbent material (ongoing)
- Decontamination of Radioactive strontium (Sr)
- Covering etc. of dredge soil over sea routes and berths
- Monitoring of ground water and seawater (implemented on an ongoing basis)

Gas/liquid waste

- Operation of the gas management system of Units 1 to 3 PCVs
- Installation of ventilation equipment/closure of the opening of blow-out panel for Unit 2
- Measurement of dust concentration at the opening of buildings etc., on-site survey
- Improve the accuracy of gas monitoring
- Land and marine environmental monitoring (implemented in an ongoing basis)

Plans toward the reduction in the radiation dose and prevention of the spread of contamination in the entire power plant

Reduction in radiation dose at the site boundary

- ▪Objective: Control the radiation dose at the site boundaries caused by radioactive substance etc. additionally released from the entire power plant at 1mSv/year or less
- Reduction of radiation dose by shielding, etc.
- Reduction of radiation dose by the purification of contaminated water etc.
- Land and marine environmental monitoring (implemented in an ongoing basis)

Site decontamination plan

- Systematic implementation of decontamination in the site of power generation plant (Decontamination is implemented in stages beginning with the areas where workers frequently enter and exit in parallel with the reduction in off-site radiation dose)
- The first step (work area: 10 to 5μSv /h Main roads: 30 to 20μSv /h)

Status of efforts on various plans (Part 4)

: Main processes
: Sub-main processes

: Field work
: R&D
: Review
:Plan until last month
Green frame: Change from last month

As of **February 27, 2014**

Challenges		The Phase 1 (no later than 2 years after the completion of the current efforts)		The Phase 2 (Early period)	
		2012	2013	2014	2015
Plan for retrieving fuel from spent fuel pool	Cask for both transport and storage	Cask manufacturing			
	Dry storage cask	Cask manufacturing			
	Harbor	Wharf restoration work			
		Carrying-in of empty casks (sequential)			
	Common pool	Already carried-in	Sequential carrying-in		
		Inspection of existing dry storage casks (9 pieces)		Retrieval of fuel from the common pool	
		Design/manufacturing of damaged fuel racks		Fixation	
		Storage of fuel retrieved from spent fuel pool (storage and management).			
	Temporary cask storage facility	Design and production			
		Installation	Acceptance and interim storage of casks		
	R&D	Evaluation of long-term integrity of fuel retrieved from spent fuel pool			
		Examination of the processing method of damaged fuel etc. retrieved from spent fuel pool			
Fuel debris removal plan	Installation of reactor building				
	Preservation of the integrity of RPV/PCV	Development of evaluation technology for integrity against corrosion of RPV/PCV			
		Corrosion protection (Reduction in dissolved oxygen contained in reactor cooling water by means of nitrogen bubbling)			
Plan for management and processing/disposal of solid radioactive waste, and the decommissioning of reactor facilities	Storage and management plans for solid wastes	Continuation of secure storage equipped with adequate shielding and scattering prevention measures			
		Development of storage management plans (Reduction in generation amount/optimization of storage)	Evaluation of waste prevention measures		Improvement of waste reducing management policy
			Establishment of vehicle maintenance shops		
			Update the storage management plan		Improvement of waste storage management
			Establishment of drum storage facility		
		Design and manufacturing of incineration plants for miscellaneous solid wastes			
		Installation of incineration plants for miscellaneous solid wastes			
		Transfer of debris to the soil-coveried temporary storage facility			
		Soil covering work for felled trees			
		Reduction of radiation dose from stored secondary wastes from water treatment through shielding etc.			
		Evaluation of secondary wastes from water treatment and lifespan of storage containers		Facility renewal plan development	
	Processing/ disposal plans for solid wastes	Development of R&D plan for safety processing/disposal	Verification of applicability of processing/disposal technologies in Japan and foreign countries		
			Waste characterization (radiochemistry analysis, assessment of volume etc.)		
	Decommissioning plans for reactor facilities	Development of feasible and rational decommissioning scenarios			
					Establishment of decommissioning scenarios
Implementation system and personnel procurement plan		Systematic cultivation/deployment of personnel, including the cooperative companies, and implementation of measures to stimulate motivation etc.			
Plan to ensure the safety of work		Continuation of safety activities, maintenance and enhancement of radiation management, continuous ensurement of medical services, etc.			
		Reduction of radiation dose in the rest area of the main office building, rest area in front of the important quake-proof building, and the important quake-proof building			

* Reviewed based on the progress status in the field

HP ND-1

Progress toward decommissioning: Fuel removal from the spent fuel pool (SFP)

Immediate target: Commence fuel removal from the Spent Fuel Pool (Unit 4, November 2013)

Unit 4

In the Mid- and Long-Term Roadmap, the target of Phase 1 was to commence fuel removal from inside the spent fuel pool (SFP) of the 1st Unit within two years of completion of Step 2 (by December 2013). On November 18, 2013, fuel removal from Unit 4, or the 1st Unit, commenced and Phase 2 of the roadmap started.
In the SFP, 1,533 fuel assemblies (1,331 of which spent and 202 new) are currently stored. The removed fuel will be transferred to the common pool and completion is scheduled for around the end of 2014.
At present 396 fuel assemblies (374 of which spent and 22 new) have been transferred to the common pool (based on the work completed as of February 26).

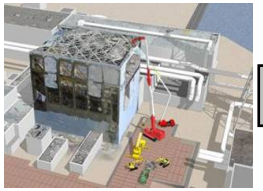

Fuel removal status

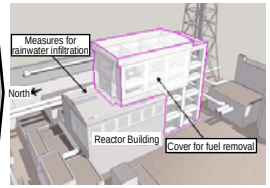

Loading the transportation container to the trailer

* Some portions of these photos, in which classified information related to physical protection is included, were corrected.

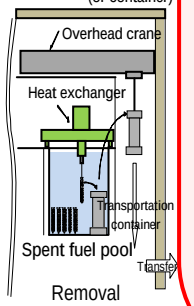
Solid measures for risks, careful checks and safety first

Steps toward fuel removal


Removal of rubble on the roof of the Reactor Building
Completed in Dec. 2012



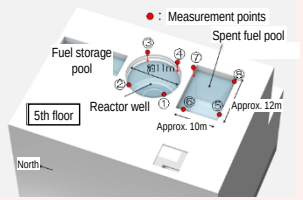
Installation of cover for fuel removal
From Apr. 2012, completed in Nov. 2013



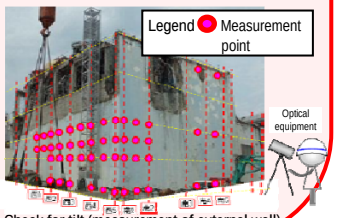
Removal
Commenced in Nov. 2013

Check of the health of the Reactor Building

Since May 2012, regular quarterly inspections have been conducted, which have confirmed that the health of the Reactor Building has been maintained.



Check for tilt (measurement of water level)



Check for tilt (measurement of external wall)

Unit 3

Toward the installation of a cover for fuel removal, installation of the gantry was completed (March 13, 2013). Removal of rubble on the roof of the Reactor Building was completed (October 11, 2013). Currently, toward the installation of a cover for fuel removal and the fuel handling system on the operating floor (*1), measures to reduce the radiation dose (decontamination and shielding) have been started (from October 15, 2013). Removal of large rubble from the SFP is underway (from December 17, 2013).

Before removal of the large rubble

After removal of the large rubble

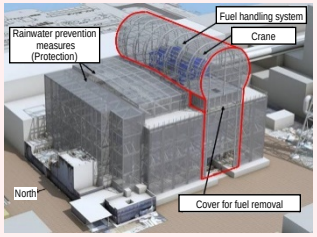


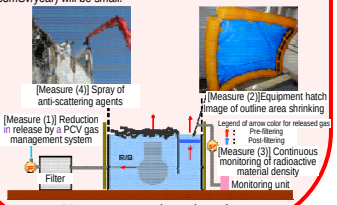
Image of the cover for fuel removal

Units 1 and 2

- Regarding Unit 1, to remove rubble on the top of the operating floor, demolition of the cover over the Reactor Building is planned. Prior to the demolition, the ventilation system of the cover was suspended (September 17, 2013). The next step will involve scheduled construction of a yard for operating large heavy machines and demolition of the Reactor Building cover will commence from the 1st half of FY2014.
- Regarding Unit 2, based on the progress of decontamination and shielding within the Reactor Building, the facilities will be inspected and a concrete plan examined and prepared.

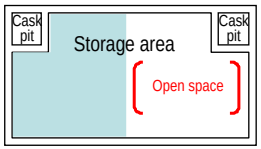
Demolition of the cover over Reactor Building Unit 1

Toward the early removal of fuel and fuel debris from the SFP, the cover over the Reactor Building will be demolished to accelerate the removal of rubble on the operation floor. The radiation dose on the site boundaries will increase compared to that before the demolition. However, with measures taken to reduce the release, the estimated impact of release from Units 1 to 3 on the site boundaries (0.03mSv/year) will be small.



Measures to reduce the release

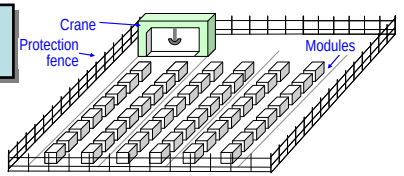
Common pool



An open space will be maintained in the common pool (Transfer to the temporary dry cask storage facility)

Progress to date
- The common pool has been restored to a condition whereby it can re-accommodate fuel to be handled (November 2012)
- Loading of spent fuel stored in the common pool to dry casks commenced (June 2013)
- Fuel removed from the Unit 4 spent fuel pool began to be received (November 2013)

Temporary dry cask (*3) storage facility



Spent fuel is accepted from the common pool

Operation commenced on April 12, 2013; from the cask storage building, transfer of 9 existing dry casks completed (May 21); fuel stored in the common pool is sequentially transferred.

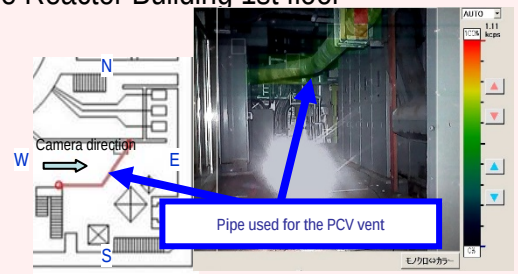
<Glossary>
(*1) Operating floor
During regular inspection, the roof over the reactor is opened while on the operating floor, fuel inside the core is replaced and core internals are inspected.
(*2) Equipment hatch: A through-hole used to carry equipment in and out of the PCV.
(*3) Cask: Transportation container for samples and equipment including radioactive materials.

Progress toward decommissioning: Works to identify the plant status and toward fuel debris removal

Immediate **target**	Identify the plant status and commence R&D and decontamination toward fuel debris removal

Survey of radiation dose on the Reactor Building 1st floor

- Toward implementing the radiation dose reduction plan and decontaminating the Reactor Building, a radiation-source survey using a gamma camera* got underway on the south side of the Reactor Building Unit 1 1st floor (from December 22-24, 2013).
- From the recorded data, a high radiation dose was confirmed on the surface of pipes used for the PCV vent.



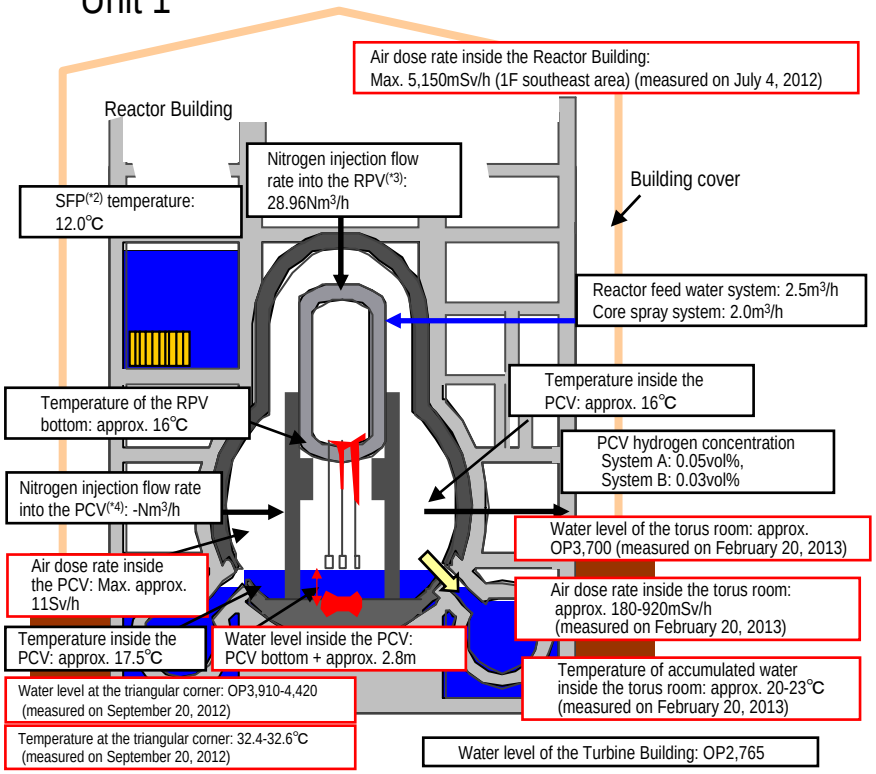
<Gamma camera data around the pipe used for the PCV vent>

* Gamma camera:
A device that measures radiation (gamma rays) from a specified direction and the distance to the subject surface, and through analysis, visualizes surface radioactivity levels.

Response related to the reactor water injection system

- At Unit 1, to ensure the reliability of continuous water injection to the reactor by the core spray system, emergency injection points will be installed on the pipes used to inject nitrogen into the RPV (within FY2014). Examination toward the additional installation of reactor water injection points, which can be constantly used, is underway (from FY2015 to around FY2016).

Unit 1



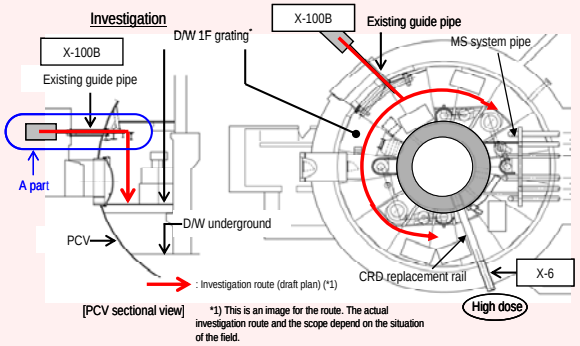
* Indices related to the plant are values as of 11:00, February 26, 2014

Status of equipment development toward investigation inside PCV

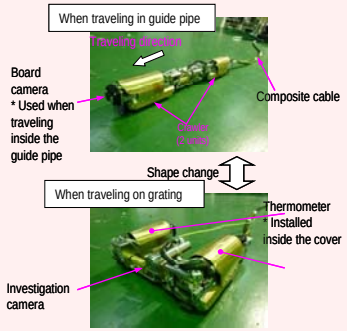
Prior to fuel debris removal, to check the conditions inside the Primary Containment Vessel (PCV), including the location of the fuel debris, investigation inside the PCV is scheduled. For Unit 1, where fuel debris may spread to the outside of the pedestal, the focus will be placed on the investigation on the external side.

[Investigation outline]
- Inserting equipment from Unit 1 X-100B penetration to investigate in clockwise and counter clockwise directions.

[Status of investigation equipment development]
- Crawler-type equipment with a shape-changing structure which allows it to enter the PCV from the narrow access entrance (bore: ϕ100mm), and stability travel on the grating is currently under development. A field demonstration is scheduled for the 2nd half of FY2014.



Investigation route inside the PCV (draft plan)



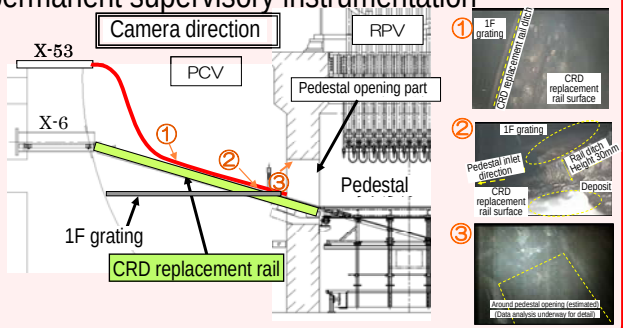
<Glossary>
(*1) S/C (Suppression Chamber):
Suppression pool, used as the water source for the emergent core cooling system.
(*2) SFP (Spent Fuel Pool):
(*3) RPV (Reactor Pressure Vessel)
(*4) PCV (Primary Containment Vessel)

Progress toward decommissioning: Works to identify the plant status and toward fuel debris removal

Immediate target	Identify the plant status and commence R&D and decontamination toward fuel debris removal

Investigation of the inside of the PCV/ installation of permanent supervisory instrumentation

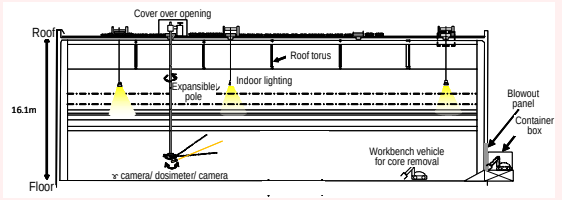
- To identify the status inside the PCV, reinvestigation was conducted (August 2 and 12, 2013). From the through-hole of the PCV, the investigative equipment was routed to the CRD exchange rail to investigate down to near the pedestal opening. The camera images will be analyzed and reflected in the future investigation plan inside the pedestal.
- Some of the permanent supervisory instrumentation for PCV could not be installed in the planned locations due to interference with the existing grating (August 13, 2013).
- The estimated reason is the entanglement of the instrumentation in the grating due to twisted cables. After training the workers, the relevant supervisory instrumentation will be reinstalled (in early April).



Status inside the PCV

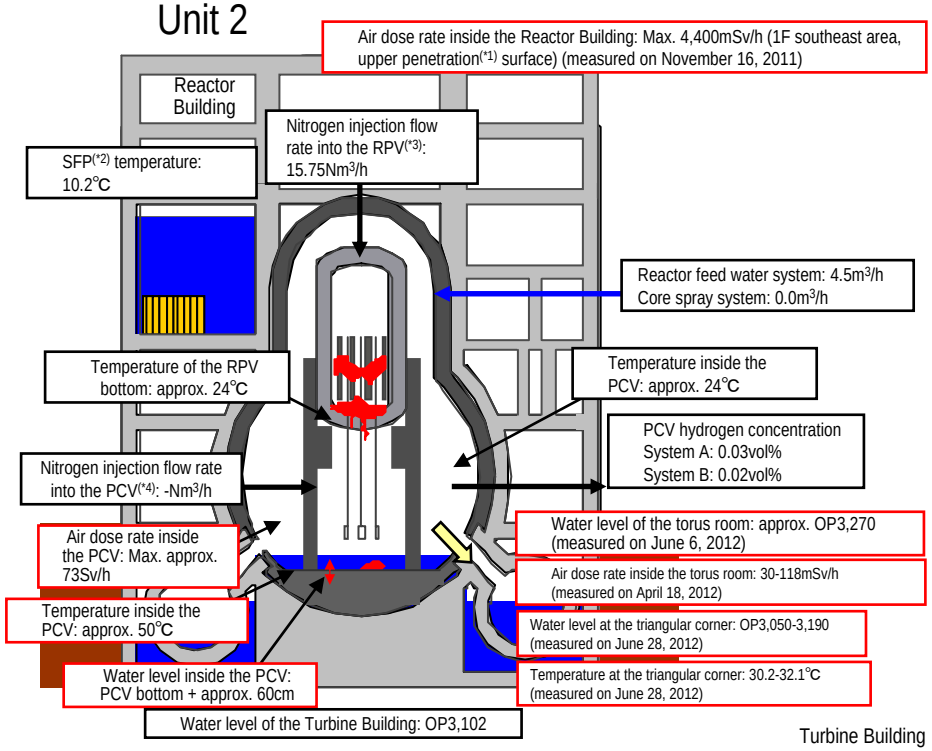
Investigation of the contamination status of the Reactor Building 5th floor

- To investigate the contamination status of the Reactor Building 5th floor, investigative equipment (gamma camera, radiation dose gauge, optical camera) will be suspended through holes drilled in the building roof. In addition, a remote workbench vehicle for core sampling was also inserted to collect core samples on the 5th floor.



Outline of investigation of the Reactor Building 5F

Unit 2



* Indices related to plant are values as of 11:00, February 26, 2014

Status of equipment development toward investigation inside the PCV

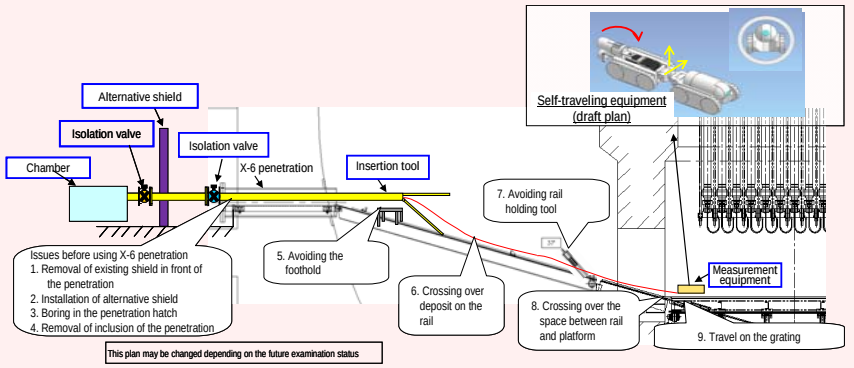
Prior to removing fuel debris, to check the conditions inside the Primary Containment Vessel (PCV) including the location of the fuel debris, investigations inside the PCV are scheduled. For Unit 2, where possibility of fuel debris spreading outside the pedestal is low, the focus will be placed on investigating the inside.

[Investigation outline]

- Inserting the equipment from Unit 2 X-6 penetration and accessing the inside of the pedestal using the CRD rail to conduct investigation.

[Status of investigative equipment development]

- Based on the issues confirmed by the CRD rail status investigation conducted in August 2013, the investigation method and equipment design are currently examined. The demonstration is scheduled in the field in the 2nd half of FY2014.



Issues of investigation inside the PCV and equipment configuration (draft plan)

<Glossary>
(*1) Penetration: Through-hole of the PCV (*2) SFP (Spent Fuel Pool)
(*3) RPV (Reactor Pressure Vessel) (*4) PCV (Primary Containment Vessel)
(*5) S/C (Suppression Chamber): Suppression pool; used as the water source for the emergency core cooling system.

Progress toward decommissioning: Works to identify the plant status and toward fuel debris removal

February 27, 2014
Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment
4/6

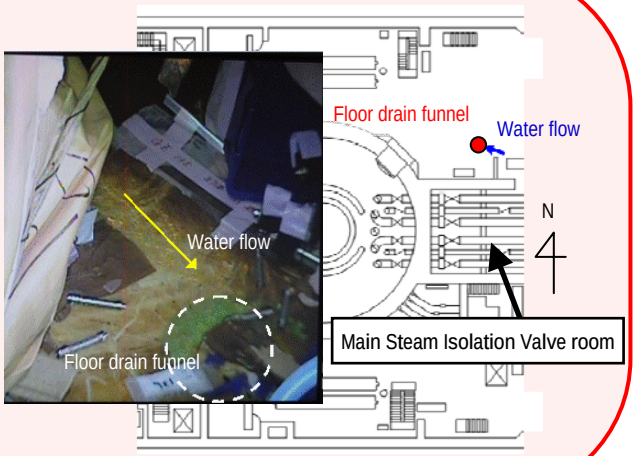
Immediate **target**	Identify the plant status and commence R&D and decontamination toward fuel debris removal

Water flow was detected from the Main Steam Isolation Valve* room

On January 18, the flow of water flow from around the door of the Steam Isolation Valve room in the Reactor Building Unit 3 1st floor northeast area to the nearby floor drain funnel (drain outlet) was detected. As the drain outlet connects with the underground part of the Reactor Building, there is no possibility of outflow from the building.

Based on the analytical results of temperature and radioactive materials of the water flow, and examination by drawings, there is a high likelihood of accumulated water, for which an indoor investigation will be conducted.

* Main Steam Isolation Valve: A valve to shut off the steam generated from the Reactor Building.



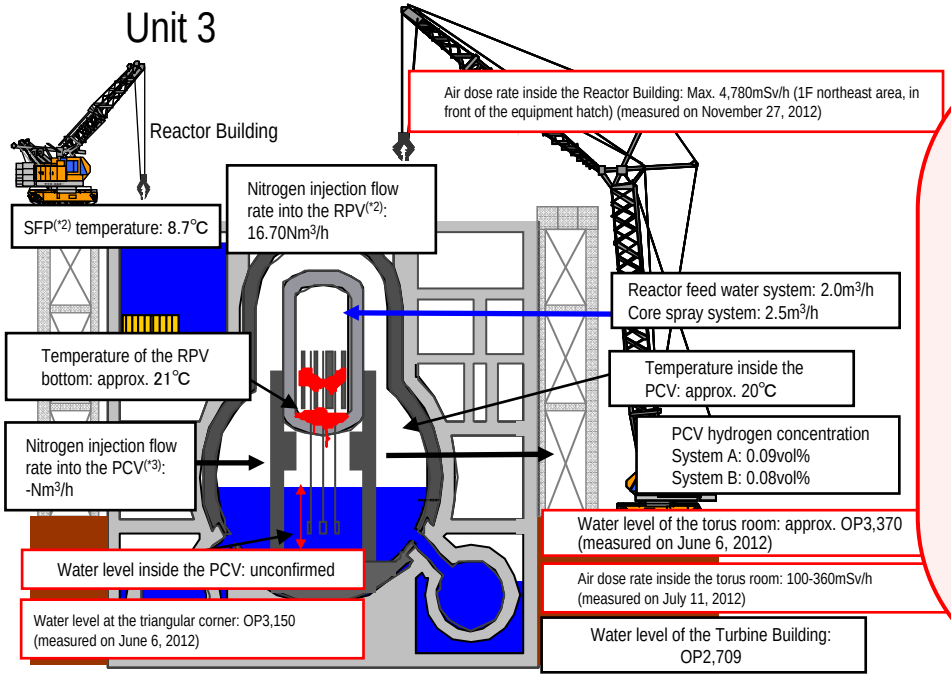
<Outline of the water flow status>

Decontamination inside R/B

・The contamination status inside the Reactor Building (R/B) was investigated by a robot (June 11-15, 2012).
・To select an optimal decontamination method, decontamination samples were collected (June 29 to July 3, 2012).
・Toward decontamination inside the Reactor Building, transfer of obstacles on the 1st floor is underway (from November 18, 2013).

Robot for investigating the contamination status (gamma camera mounted)

Unit 3



* Indices related to plant are values as of 11:00, February 26, 2014

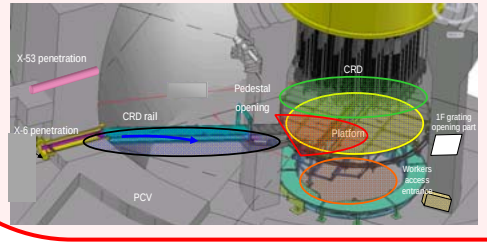
Status of equipment development toward investigation inside the PCV

Prior to fuel debris removal, to check the conditions inside the Primary Containment Vessel (PCV), including the location of the fuel debris, investigation inside the PCV is scheduled. For Unit 3, where the possibility of fuel debris spreading outside the pedestal is low, the focus will be placed on investigating the inside. As the water level inside the PCV is high and the penetration which is scheduled for use in Units 1 and 2 may sink in the water, another method need to be examined.

[Steps for investigation and equipment development]

(1) Investigation from X-53 penetration
- Following decontamination, a field investigation is scheduled in the areas around X-53 penetration to determine the policy for conducting the inside investigation and equipment specifications.

(2) Investigation plan following the investigation of X-53 penetration
- Based on the measurement values of hydraulic head pressure inside the PCV, X-6 penetration may sink. It is estimated that access to X-6 penetration is difficult.
- For access from another penetration, approaches such as “further downsizing the equipment” or “moving in water to access the pedestal” are necessary and will be examined.



<Glossary>
(*1) SFP (Spent Fuel Pool)
(*2) RPV (Reactor Pressure Vessel)
(*3) PCV (Primary Containment Vessel)
(*4) TIP (Traversing Incore Probe System)
Measures neutrons by moving the detector up and down inside the core.

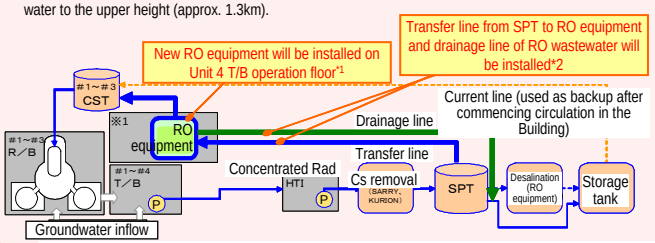
Progress toward decommissioning: Work related to circulation cooling and accumulated water treatment line

Immediate target	Stably continue reactor cooling and accumulated water treatment, and improve reliability

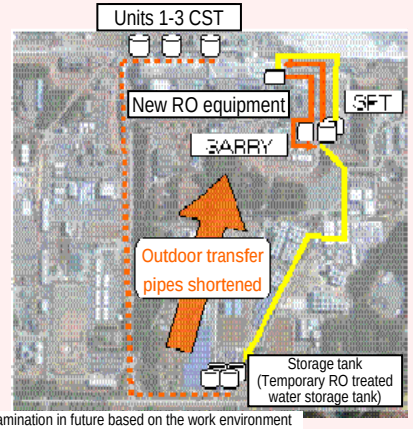
Work to improve the reliability of the circulation water injection cooling system and pipes to transfer accumulated water.

- Operation of the reactor water injection system using Unit 3 CST as a water source commenced (from July 5, 2013). Compared to conventional systems, in addition to the shortened outdoor line, the reliability of the reactor water injection system was enhanced, e.g. by increasing the amount of water source storage and enhancing durability.
- By newly installing RO equipment inside the Reactor Building by the end of FY2014, the reactor water injection loop (circulation loop) will be shortened from approx. 3km to approx. 0.8km*.

* The entire length of contaminated water transfer pipes are approx. 2.1m, including the transfer line of surplus water to the upper height (approx. 1.3km).

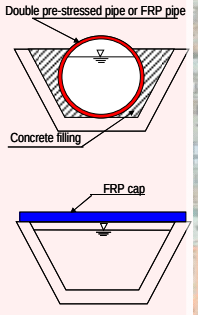


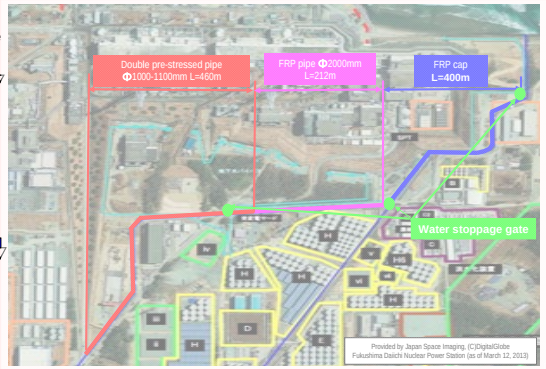
*1 Unit 4 T/B operation floor is one of the installation proposals, which will be determined after further examination in future based on the work environment
*2 A detailed line configuration will be determined after further examination in future



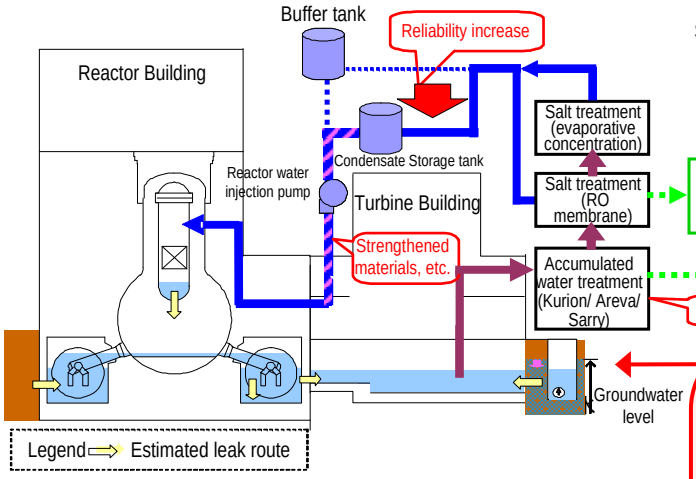
Progress of measures in the Tank Area

- To prevent inflow from any leak of contaminated water from a tank to the drainage, the drainage was covered (completed on February 22).



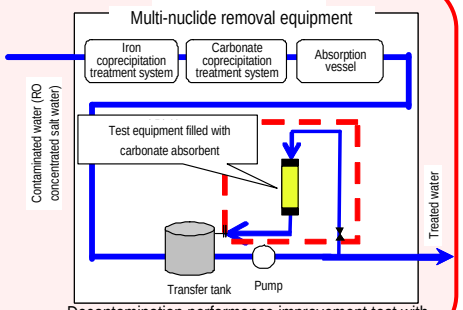


Status of drainage covering



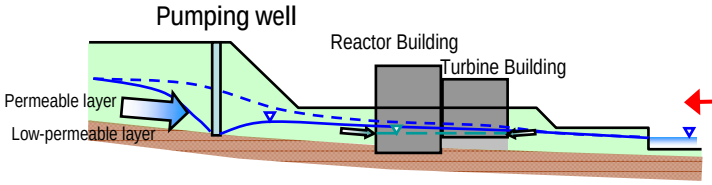
Status of multi-nuclide removal equipment

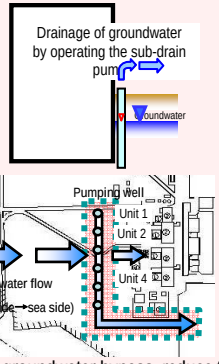
- Hot tests using radioactive water were sequentially commenced (System A: from March 30, 2013, System B: from June 13, 2013, System C: from September 27, 2013).
- For System A, from January 24, in response to the detection of four radioactive nuclides (excluding tritium) such as iodine 129 in the treated water, measures to improve performance with actual equipment using activated carbon adsorbent is underway.
- System B has been suspended since January 24 to verify the effectiveness of anti-corrosion measures. After confirming the same, treatment was resumed on February 12.
- As for System C, treatment operation continues.
- For early treatment of treating contaminated water (RO concentrated salt water) stored within the site, additional multi-nuclide removal equipment and high-performance multi-nuclide removal equipment will be installation. Site preparation work for installation of the equipment will begin in March.



Decontamination performance improvement test with actual equipment

Preventing groundwater from flowing into the Reactor Buildings





To reduce groundwater level by sub-drain water pumping, treatment tests were conducted for some sub-drain pits of Units 1-4. The next stage will involve scheduled examination of the sub-drain recovery method.

Reducing groundwater inflow by pumping sub-drain water

Measures to pump up groundwater flowing from the mountain side upstream of the Building to reduce the groundwater inflow (groundwater bypass) have been implemented.
The groundwater quality has been checked and evaluated to confirm that the radioactive density remains appropriately low compared to rivers around the power station.
Pumped groundwater is temporarily stored in tanks and appropriately operated.
Installation of a pumping well and pumping/transfer facilities are completed.
Based on the water quality result and after obtaining the consent of related parties, operation will commence sequentially.

Via a groundwater bypass, reduce the groundwater level around the Building and groundwater inflow into the Building

<Glossary>
(*1) CST (Condensate Storage Tank)
Tank for temporarily storing water used in the plant.

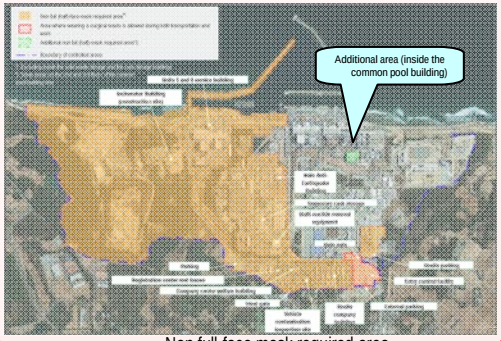
Progress toward decommissioning: Work to improve the environment within the site

Immediate **target**	・Reduce the effect of additional release from the entire power station and radiation from radioactive waste (secondary water treatment waste, rubble, etc.) generated after the accident, to limit the effective radiation dose to below 1mSv/year at the site boundaries. ・Prevent contamination expansion in sea, decontamination within the site

Expansion of non full-face mask required area

Operation based on the rules for mask wearing according to radioactive material density in air and decontamination/ ionization rules was defined, and the area is being expanded.

As it was confirmed that the density of radioactive materials in air is under the level for non full-face mask required area in some parts on the 2nd and 3rd floors of the common pool building, these areas will be set as non full-face mask required area, to reduce burden on workers and improve productivity (scheduled for commencement on March 10).



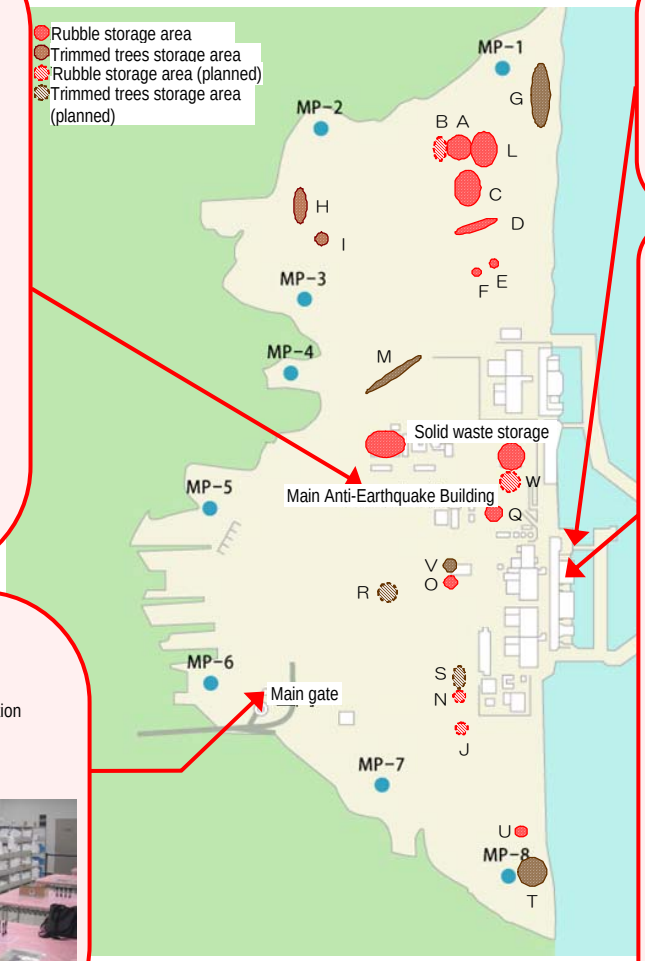
Non full-face mask required area

Entry control facility was established

An entry control facility near the main gate of the Fukushima Daiichi Nuclear Power Station commenced operation from June 30, 2013, where contamination tests, decontamination, switching on and off of protective equipment, and distribution/ collection of dosimeters are being conducted.

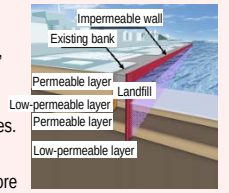

External view of the entrance control facility


Inside the entrance control facility



Installation of impermeable walls

To prevent contamination expansion into the sea when contaminated water leaks into groundwater, impermeable walls are being installed (scheduled for completion in September 2014).
Installation of steel pipe sheet piles temporarily completed by December 4, 2013 except for 9 pipes. The next stage will involve installing steel pipe sheet piles outside the port, landfilling within the port, and installing a pumping facility to close before the construction completion.



Impermeable wall (image)

Reducing radioactive materials in seawater within the port

・The analytical result for data such as the density and level of groundwater on the east (sea) side of the Building identified that contaminated groundwater was leaking into seawater.
・No significant change has been detected in seawater within the port for the past month, nor was any significant change detected in offshore measurement results as of last month.
・To prevent contamination expansion into the sea, the following measures are being implemented:

(1) Preventing leakage of contaminated water
・Underground soil improvement behind the bank protection to prevent expansion of radioactive materials.
(Between Units 1 and 2: completed on August 9, 2013; between Units 2 and 3: from August 29 and completed on December 12, 2013; between Units 3 and 4: from August 23, 2013 and completed on January 23)
・Pumping of groundwater in contaminated areas (from August 9, scheduled to commence sequentially)

(2) Isolating groundwater from the contamination source
・Enclosure by improving underground soil on the mountain side
(Between Units 1 and 2: Commenced from August 13, 2013 and scheduled for completion by end March; between Units 2 and 3: Commenced from October 1, 2013 and scheduled for completion early February; between Units 3 and 4: Commenced from October 19, 2013 and scheduled for completion by end February)
・To prevent the ingress of rainwater, the ground surface is being paved with asphalt (commenced on November 25, 2013)

(3) Removing the contamination source
・Removal and closure of contaminated water such as branch trench (completed on September 19, 2013)
・Purification and removal of contaminated water in the main trench
(Unit 2: Purification commenced on November 14, 2013; Unit 3: commenced on November 15, 2013)
(Frozen water stoppage, water drainage: Freezing is scheduled for commencement by end March)