Summary of Decommissioning and Contaminated Water Management

October 30, 2014

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

Main works and steps for decommissioning

Fuel removal from Unit 4 SFP is underway. Preparatory works to remove fuel from Unit 1-3 SFP and fuel debris (Note 1) removal are ongoing.

(Note 1) Fuel assemblies melted through in the accident.

Fuel Removal from SFP

Unit 1&2 / Unit 3 / Unit 4

Rubble removal & dose reduction → Installing FHM* → Fuel removal → Storage and handling

Unit 1: FY2017 Fuel removal will start (under consideration)
Unit 2: After FY2017 Fuel removal will start (under consideration)
Unit 3: FY2015 Fuel removal will start (planned)
Unit 4: 2014 Fuel removal will be completed

FHM*: Fuel-Handling Machine

Fuel Debris (Corium) Removal

Unit 1-3

Dose reduction & Leakage identification → Stop leakage → Fuel debris removal → Storage and handling

After FY2017
Water stoppage of PCV lower part (under consideration)

Dismantling Facilities

Scenario development & technology consideration → Design & Manufacturing of devices/ equipment → Dismantling

Fuel removal from SFP

Fuel removal from Unit 4 SFP has been underway since November 18, 2013.
Removal of spent fuel assemblies is scheduled for completion in November and non-irradiated fuel assemblies in December 2014.

(Fuel-removal operation)

Three principles behind contaminated water countermeasures

Countermeasures for contaminated water (Note 2) are implemented with the following three principles:

(Note 2) The amount is decreasing due to measures such as groundwater bypass and water-stoppage of the buildings.

1. **Eliminate** contamination sources

① Multi-nuclide removal equipment

② Remove contaminated water in the trench (Note 3)

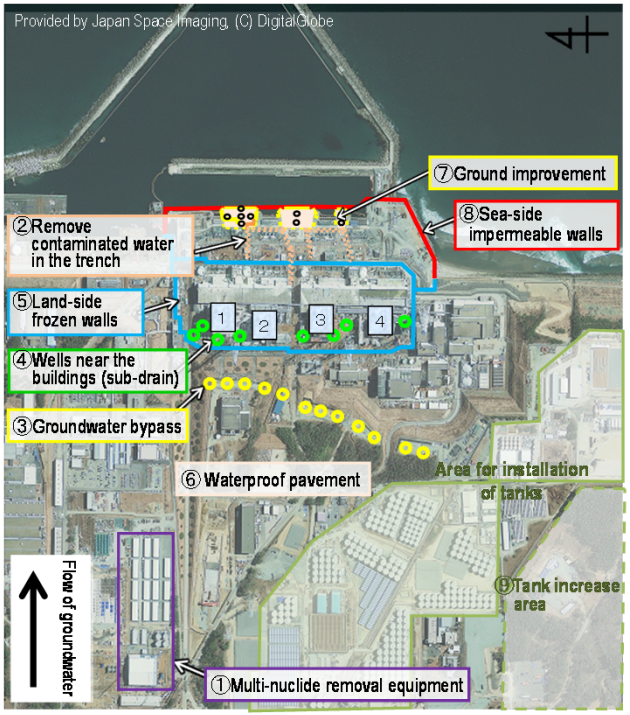
(Note 3) Underground tunnel containing pipes.

2. **Isolate** water from contamination

③ Pump up ground water for bypassing
④ Pump up ground water near buildings
⑤ Land-side frozen walls
⑥ Waterproof pavement

3. **Prevent leakage** of contaminated water

⑦ Soil improvement by sodium silicate
⑧ Sea-side impermeable walls
⑨ Increase tanks (welded-joint tanks)



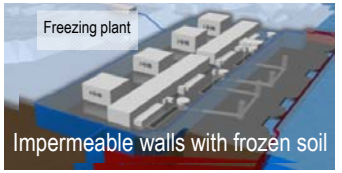
Multi-nuclide removal equipment (ALPS)

- This equipment removes radionuclides from the contaminated water in tanks, and reduces risks.
- It aims to reduce the levels of 62 nuclides in contaminated water to the legal release limit or lower (tritium cannot be removed.)
- Furthermore, additional multi-nuclide removal equipment is installed by TEPCO (operation started September 2014) as well as a subsidy project of the Japanese Government (operation started October 2014.)

(Installation status of high-performance multi-nuclide removal equipment)

Land-side impermeable walls with frozen soil

- The walls surround the buildings with frozen soil and reduce groundwater inflow into the same.
- On-site tests have been conducted since last August. Construction work started in June and the freezing operation will start within FY2014.



(Length: approx. 1,500m)

Sea-side impermeable walls

•The walls aim to prevent the flow of contaminated groundwater into the sea.
•Installation of steel sheet piles is almost (98%) complete. The closure time is being coordinated.

(Installation status)

Progress status

◆ The temperatures of the Reactor Pressure Vessel (RPV) and the Primary Containment Vessel (PCV) of Units 1-3 have been maintained within the range of approx. 25-45°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 had been maintained.

*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).

Spray of anti-scattering agents and investigation prior to dismantling the Unit 1 R/B cover

To promote progress in dismantling the building cover, spraying of anti-scattering agents began from holes opened in the roof panels of the building cover on October 22.
Next, two roof panels will be removed and the rubble status and dust density on the operating floor will be investigated. The removed roof panels will be temporarily returned to the roof by early December.
On October 28, though the nozzle tip used to spray anti-scattering agents moved due to the wind and expanded the hole of the roof panel, from which the nozzle is inserted to spray anti-scattering agents, no significant variation in monitoring posts and dust monitors was detected.

<Opening of roof panel holes and spraying of anti-scattering agents>

Reducing the risk of contaminated water stored in tanks

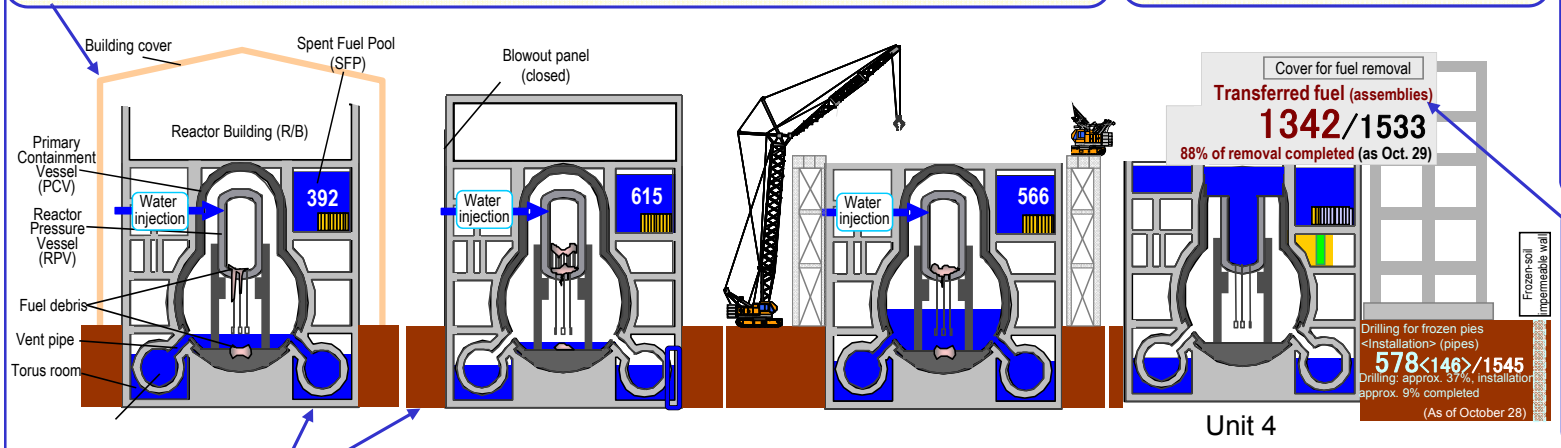
All systems of three multi-nuclide removal equipment (ALPS) (existing, additional and high-performance) are operating.
In addition, work to install multiple treatment equipment to reduce the density of strontium is underway. This equipment is also used to reduce the risks of contaminated water stored in tanks.

Typhoon measures improved for Tank Area

Enhanced rainwater measures were implemented, including increasing the height of fences and installing rain gutters and a fence cover. Though a total of 300mm of rainfall was recorded by typhoon Nos. 18 and 19, no outflow of rainwater from inside the fences was detected.

Density increased in groundwater and release channel after typhoon

Though the density of radioactive materials in part of the groundwater and accumulated water in the Unit 1 release channel increased after Typhoon No. 18 passed, no variation was detected in seawater inside/outside the port.
To prevent any outflow of groundwater, ground improvement using water glass has been implemented and pumping of groundwater continues. In addition, the monitoring frequency of accumulated water in Unit 1 release channel will be increased to prepare for purification.

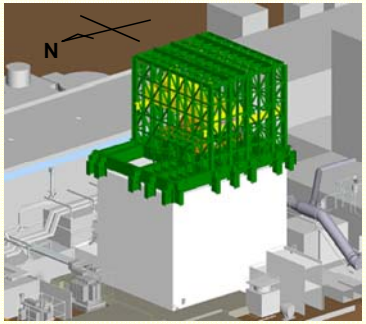


Fuel removal from Unit 4 spent fuel pool (SFP)

Approx. 88% of fuel removal has been completed and transfer of spent fuel to the common pool will be completed with the next transfer. Non-irradiated fuel assemblies will be transferred to Unit 6 SFP by December.

Plan for fuel removal from Units 1 and 2

Examination was made regarding fuel removal from Units 1 and 2, and it was decided to install containers on the Reactor Buildings after checking their seismic safety.
Regarding Unit 1 where early fuel removal from the pool may reduce risks, facilities dedicated to fuel removal from the pool will be installed.
Regarding Unit 2, examination on the nature of the facility to be installed to within a scope not impacting on the start period for fuel removal in parallel with preparation around the building.



<Image of the Unit 1 fuel-removal facility>

Covering over the seabed in front of the Shallow Draft Quay completed

Construction to cover the seabed soil has been underway to prevent contaminated soil within the port from being stirred-up since July 17.
The covering in front of Shallow Draft Quay was completed on October 11. The seabed in front of the intake had been covered by FY2012.

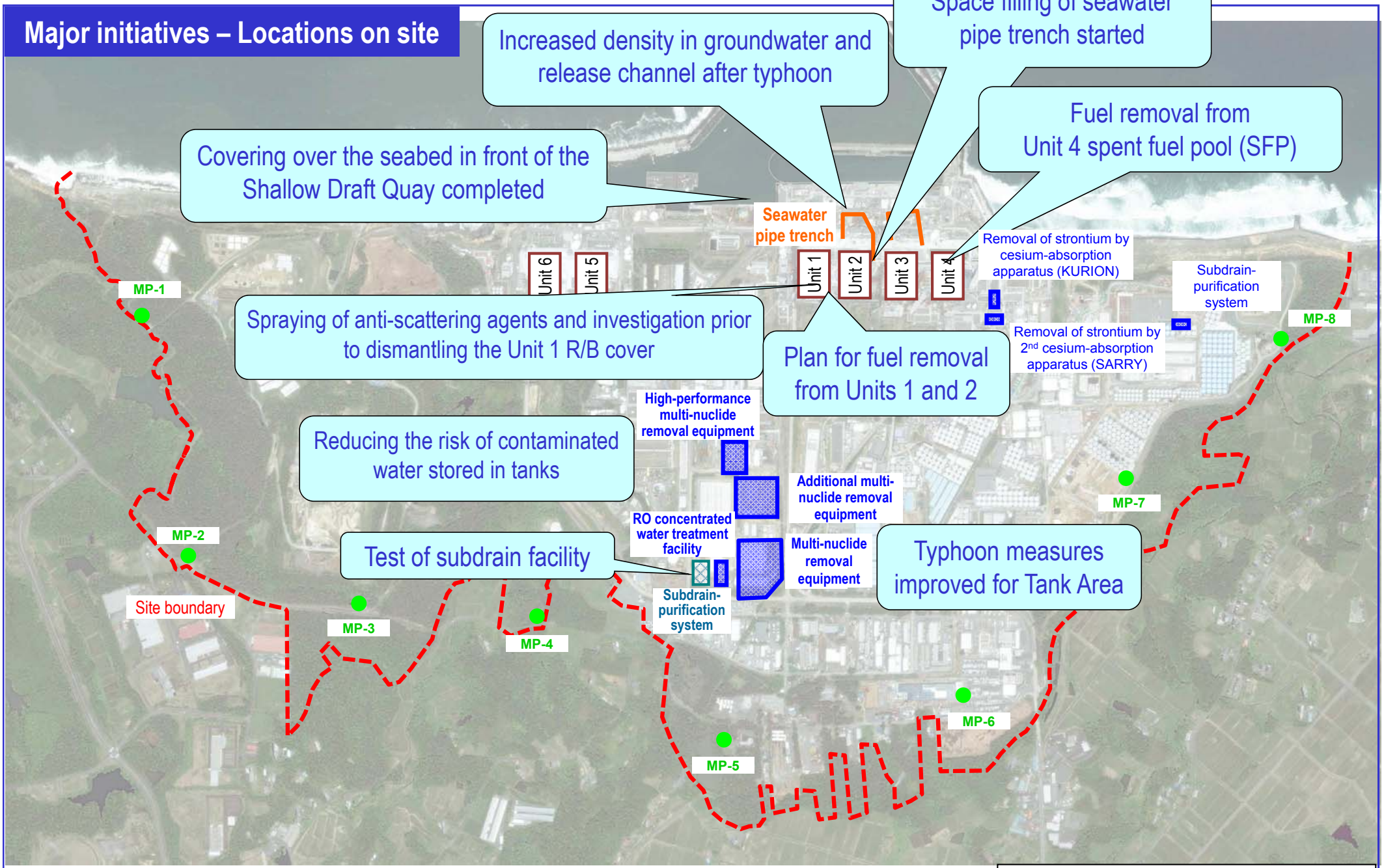
Space filling of seawater pipe trench started

To strengthen the ice between the Unit 2 seawater pipe trench and building, injection of space filler started at the connections with the building on October 16.
Following the injection, work will start to remove the contaminated water and close the trenches.

Test of subdrain facility

Groundwater was pumped up from the wells (subdrains) around the buildings and tested to verify stable operation. As of October 29, approx. 3,000 ton of groundwater had been purified.
Though the radioactive material density was temporarily increased in part of wells, it later returned to the pre-installation level. The estimated cause was contamination drawn from the neighboring well, which could not been recovered due to a mixture of rubble.

Major initiatives – Locations on site



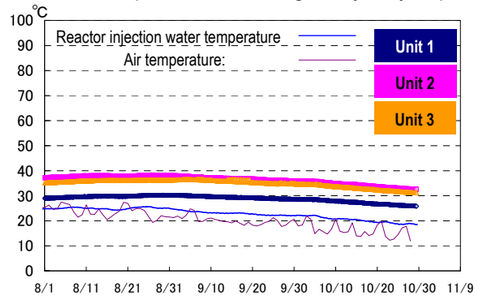
Provided by Japan Space Imaging, (C) DigitalGlobe

* Data of Monitoring Posts (MP1-MP8.)
Data of Monitoring Posts (MPs) measuring airborne radiation rate around site boundaries show 1.263 - 4.475μSv/h (September 24-October 28, 2014.)
We improved the measurement conditions of monitoring posts 2 to 8 for precise measurement of air dose rate. Construction works such as tree-clearing, surface soil removal, and shield wall setting were implemented from Feb 10 to Apr 18. Therefore monitoring results at these points are lower than elsewhere in the power plant site.
The radiation shielding panel around the monitoring post No. 6, which is one of the instruments used to measure the radiation dose of the power station site boundary, were taken off from July 10 to July 11, since the surrounding radiation dose has largely fallen down due to further cutting down of the forests etc.

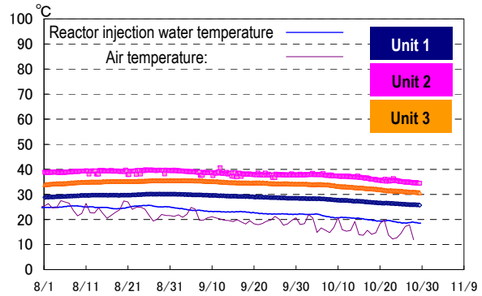
I. Confirmation of the reactor conditions

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. 25 to 45°C for the past month, though they vary depending on the unit and location of the thermometer.



RPV bottom temperatures (recent quarter)



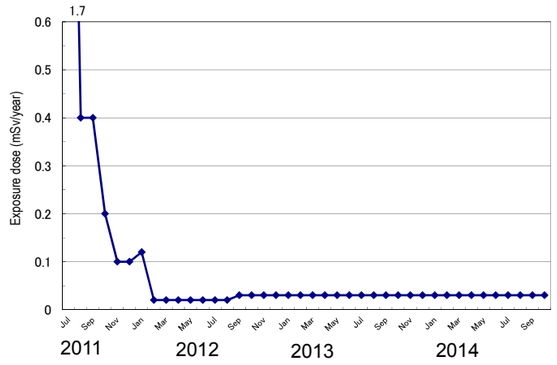
PCV gas phase temperatures (recent quarter)

* 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 at site boundaries was evaluated at approx. 1.3 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 values):
  [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)
* Data of Monitoring Posts (MP1-MP8).
  Data of Monitoring Posts (MPs) measuring airborne radiation rate around site boundaries showed 1.263 - 4.475μSv/h (September 24 - October 28, 2014)
  To measure the variation in the airborne radiation rate of MP2-MP8 more accurately, environmental improvement (tree trimming, removal of surface soil and shielding around the MPs) has been completed.

Note: Different formulas and coefficients were 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 was 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

➢ Replacement of the thermometer at the bottom of Unit 2 RP

- In April, attempts to remove and replace the thermometer installed at the bottom of the RPV, which had broken in February 2014, failed and the operation was suspended. The estimated cause was fixing or added friction due to rust having formed. To facilitate the task, mock-up test equipment using full-scale piping was prepared.
- To remove rust, the use of rust-stripping chemicals was examined (evaluation of hydrogen generation) and tests verifying the effect of vibration to alleviate drawing tension were conducted, to select methods to be applied onsite work.
- After training the workers to be involved with the mock-up test equipment using full-scale piping, the elimination will be implemented around December 2014 to January 2015.

➢ Status of the preliminary survey to investigate inside Unit 3 PCV

- From October 22-24, the status of X-53 penetration, which may be under the water and scheduled for use to investigate the inside of the PCV, was investigated using remote-controlled ultrasonic test equipment. The results showed that the penetration is not under the water.
- Next, the inside of the PCV through X-53 penetration will be investigated in around the 1st half of FY2015. As the radioactivity dose is high around X-53 penetration, the introduction of remote-controlled equipment will be examined based on the status of decontamination and shielding.

2. Accumulated water-treatment plan

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

➢ Operation of groundwater bypass

- From April 9, the operation of 12 groundwater bypass pumping wells commenced sequentially to pump up groundwater. Release commenced from May 21 in the presence of officials from the Intergovernmental Liaison Office for the Decommissioning and Contaminated Water Issue of the Cabinet Office. As of October 29, 48,439 m^3 of groundwater had been released. The pumped up groundwater has been temporarily stored in tanks and released after TEPCO and a third-party organization (Japan Chemical Analysis Center) confirmed that its quality met operational targets.
- It was confirmed that the groundwater inflow into the buildings had decreased by 90m^3/day based on the evaluation data by now through measures such as the groundwater bypass and water stoppage of the High Temperature Incinerator Building (HTI) (see Figure 1).
- It was confirmed that the groundwater level at the observation holes had decreased by approx. 20-25cm compared to the level before pumping at the groundwater bypass started (see Figure 2).

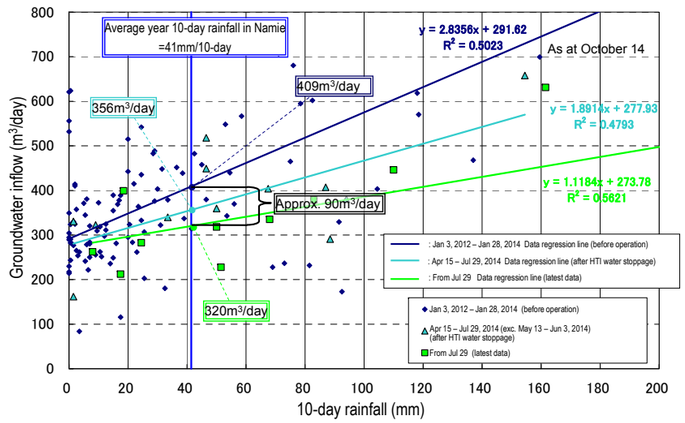


Figure 1: Analytical results of inflow into buildings

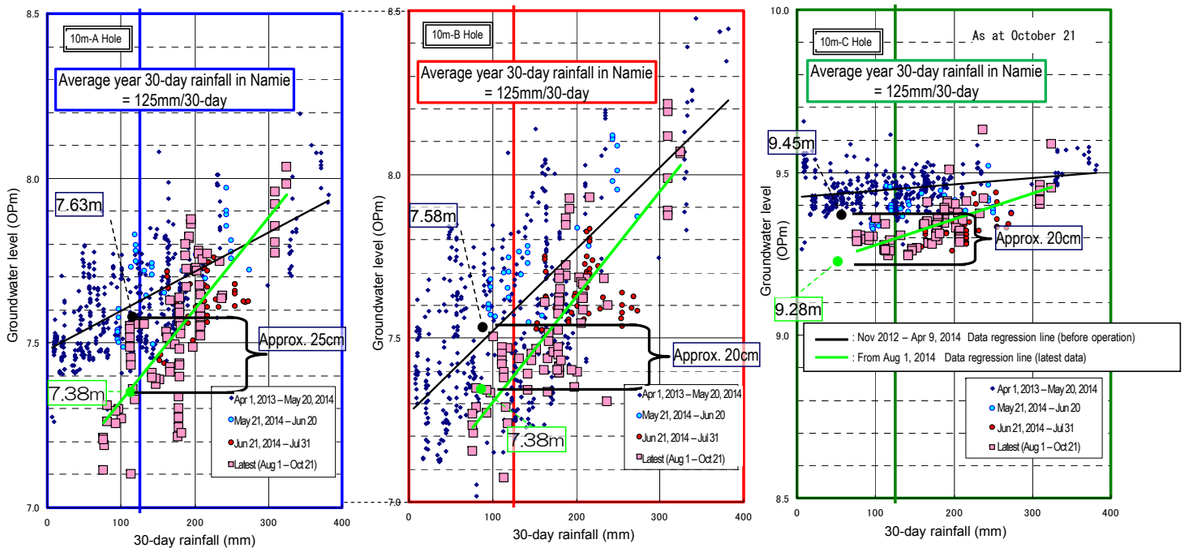


Figure 2: Water levels of groundwater bypass Observation Holes

➢ Construction status of impermeable walls with frozen soil

- To facilitate the installation of frozen-soil impermeable walls surrounding Units 1-4 (a subsidy project of the Ministry of Economy, Trade and Industry), drilling to place frozen pipes commenced (from June 2). As of October 28, drilling at 686 points (for frozen pipes: 578 of 1,545 points, for temperature-measurement pipes: 108 of 315 points) and installation of frozen pipes at 146 of 1,545 points had been completed (see Figure 3).
- Installation of chillers for freezing is underway (from August 26 and scheduled for completion on November 22, installation of 20/30 units had been completed).
- Regarding the areas where frozen pipes are installed into the buried pipes penetrating the ground, an investigation to check the accumulated water began in advance (from October 3).

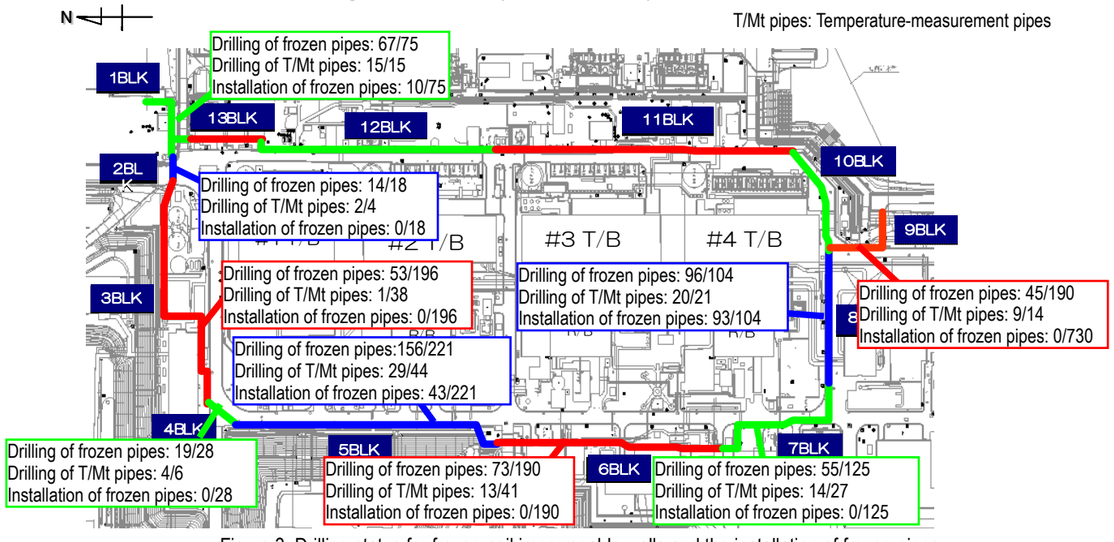


Figure 3: Drilling status for frozen-soil impermeable walls and the installation of frozen pipes

➢ Status of the subdrain system

- Regarding the purification system for subdrain water system operation tests were conducted to ensure stable operation (from September 16).
- A detailed analysis was conducted for 47 nuclides in underground water after purification, which was verified in the purification verification test on August 20. The results showed that the post-purification water quality was appropriate with the density of radioactive materials sufficiently low, and the system had purification ability to reduce the densities of radioactive materials (cesium 134 and 137, strontium 90) detected before purification to below 1/1,500.
- The operation of 28 subdrain pits was checked, since this had not been done previously (October 6-8).
- It was confirmed that the density of cesium 137 in groundwater pumped up during the system-operation test was high at approx. 28,000 Bq/L. The investigative results concerning the water quality of the subdrain pits identified an increase in the density of radioactive material at pit Nos. 18 and 19. However, the density radically declined in the water quality measurement two days later. It was estimated that as those pits connect with Nos. 15-17, which could not be recovered due to rubble, via horizontal pipes, the fallout components were gradually drawn into pit Nos. 18 and 19.
- Treated groundwater will be released inside the port after confirming it meets the above operational target. The release will be contingent on the relevant parties reaching agreement.

➢ Operation of multi-nuclide removal equipment

- Regarding multi-nuclide removal equipment (existing, additional and high-performance), hot tests using radioactive water are underway (for existing equipment, System A: from March 30, 2013, System B: from June 13, 2013, System C: from September 27, 2013; for additional equipment, System A: from September 17, System B: from September 27, System C: from October 9, 2014; for high-performance equipment, from October 18,2014). To date, approx. 154,000 m^3 at the existing, approx. 19,000 m^3 at the additional and approx. 1,000 m^3 at the high-performance multi-nuclide removal equipment have been treated (as of October 28, including approx. 9,500m^3 stored in J1(D) tank, which contained water with a high density of radioactive materials at the System B outlet).
- Regarding the existing System B, as the calcium density at the inlet of absorption vessels increased and carbonate outflow from a filter to downstream was detected, treatment was suspended on September 26. Distortion and cracks were also detected in part of the hexagonal gaskets of the filter (see Figure 4). The estimated cause of the distortion was pressure pulsation during operation of the equipment to resolve the filter clogging (back-pulse pot.) The filter causing the incident was replaced and treatment resumed on October. Regarding measures to reduce the operational pressure of the back-pulse pot, within a range not influencing operation, horizontal deployment to other systems and additional multi-nuclide removal equipment is underway.
- Regarding the existing System C, though operation was suspended on September 21 to replace the filters after iron coprecipitation treatment with improved filters, treatment resumed on September 30.

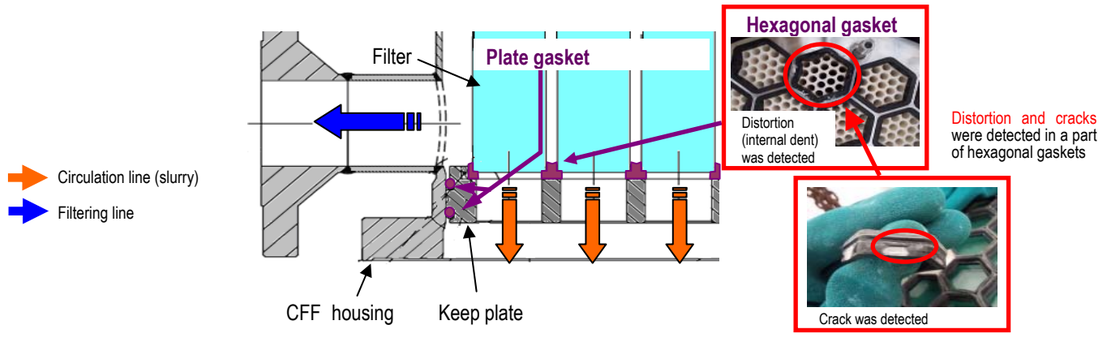


Figure 4: Filter damage to multi-nuclide removal equipment System B

➢ Toward risk reduction of contaminated water stored in tanks

- In addition to multi-nuclide removal equipment (existing, additional and high-performance), the installation of multiple treatment equipment that reduce the density of strontium is underway. This equipment is also used to reduce the risks of contaminated water stored in tanks.
- To purify RO concentrated salt water stored in tanks, mobile strontium-removal equipment started operation in the G4 south area (from October 2) (see Figure 5).
- The implementation plan for RO concentrated-water treatment equipment to remove strontium, a major radioactive material included in RO concentrated salt water, was submitted (October 16).

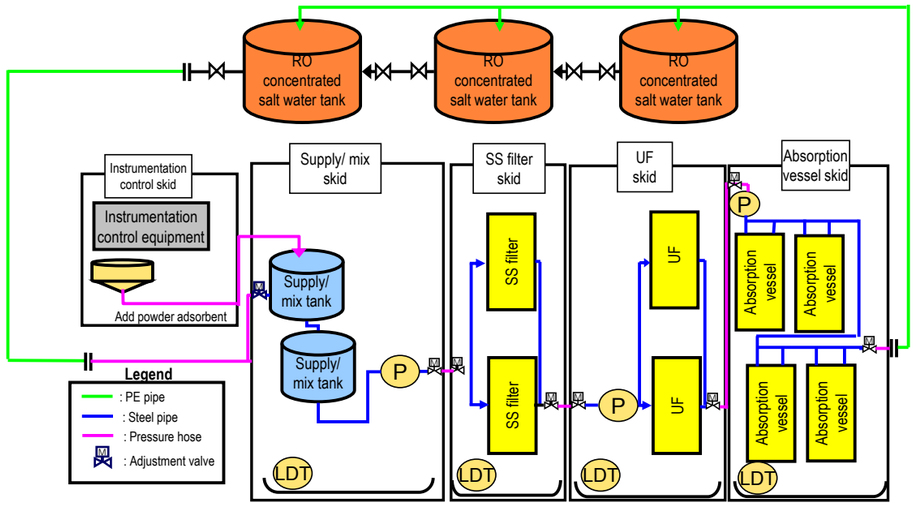


Figure 5: Mobile strontium-removal equipment system outline

➢ Measures in Tank Areas

- Compared to the typhoon season last year, enhanced measures were implemented this year, including increasing the height of fences, controlling rainwater (rain gutters and fence cover), increasing the size of rainwater collection tanks and transfer pumps, and installing cameras to monitor water levels inside the fences. These measures consequently allow focus on the temporary fence areas, which is currently under construction, and significant energy saving, helping prevent any increase in contaminated water inside the buildings and controlling outflow from the fences.
- Rainwater under the temporary release standard having accumulated inside the fences in the contaminated water tank area, was sprinkled on site after removing radioactive materials using rainwater-treatment equipment since May 21 (as of October 27, a total of 11,470 m^3).
- The destination of the C-release channel was also switched from outside to inside the port from July 14, while the amount released inside the port was increased from 0.1 to 0.3m^3/s (October 6). No problem was detected with the release-channel functions. Monitoring of results within the port also identified no significant change, either during the regular period or rainfall.

➢ Removal of contaminated water from seawater-pipe trenches

- Contaminated water in the trenches will be removed and sealed off after building separation by freezing connections between the seawater-pipe trenches and the Unit 2 and 3 buildings.
- At the seawater-pipe trench Unit 2 Vertical Shaft A, freezing started on April 28. As sufficient water-stoppage effect had not been achieved, injection of ice started on July 30, followed by dry ice on August 12 to accelerate chilling. In addition, to facilitate freezing, space filling has been conducted since October 20 and as of October 29, filling around the cable tray is underway.
- At the seawater-pipe trench Unit 2 open-cut duct, freezing started on June 13 and space filling has been conducted since October 16. As of October 29, filling on the Vertical Shaft D side was completed and preparation for filling the top of the packer is underway (see Figure 6).
- At the seawater-pipe trench Unit 3 Vertical Shaft A, drilling of holes for frozen and temperature-measurement pipes was completed (September 4). At Vertical Shaft D, drilling of holes for frozen and temperature-measurement pipes is underway. Installation of holes for frozen and temperature-measurement pipes and space filling will be concluded around the end of November, whereupon water removal and closure will start from mid-December.

Installation procedure
1. Drill new holes for filling on the top of the packer (to make holes for filling on the top)
2. Using the packer as a side frame, install quick-setting plastic grout from K1 and K3 holes to fill around the pipes.
3. Install quick-setting plastic grout from new holes to fill on the top of the packer.

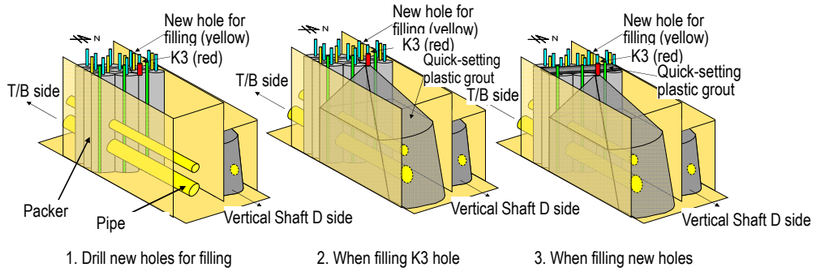


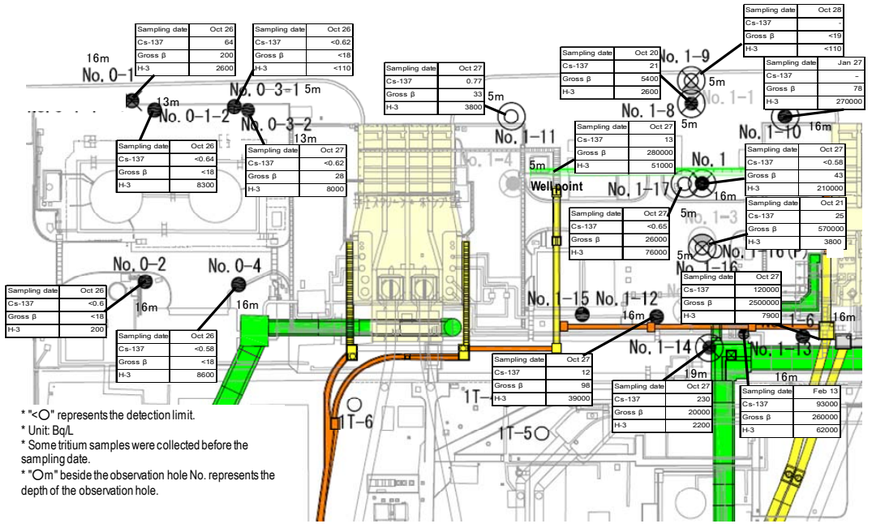
Figure 6: Image of Unit 2 open-cut duct and space filling

3. Plan to reduce radiation dose and mitigate contamination

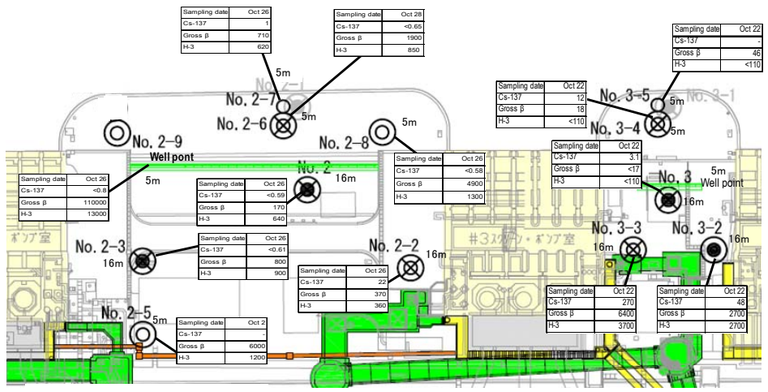
Effective dose-reduction at site boundaries and purification of the port water to mitigate the impact of radiation on the external environment

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

- Regarding the radioactive materials in groundwater near the bank on the north side of the Unit 1 intake, the density of tritium is increasing at groundwater Observation Holes Nos. 0-1-2 and 0-4, currently standing at around 7,000 Bq/L for each. Pumping of 1 m^3/day of water from Observation Hole No. 0-3-2 continues.
- Regarding the groundwater near the bank between the Unit 1 and 2 intakes, the density of radioactive materials previously peaked in groundwater sampled at Observation Hole No. 1-6 after Typhoon No. 18 passed through (on October 9 and 13) (cesium 137: 190,000 Bq/L, gross β: 7.8 million Bq/L). There is the possibility that radioactive materials included in contaminated soil near the surface were mixed in the groundwater. Water pumping from the well point (approx. 60 m^3/day) and the pumping well No. 1-16 (P) (1m^3/day) installed near the Observation Hole No. 1-16 continues.
- Regarding the radioactive materials in groundwater near the bank between the Unit 2 and 3 intakes, the densities of tritium and gross β radioactive materials are high on the north (Unit 2) side as until September. Water pumping from north of the well point continues (4 m^3/day).
- Regarding the radioactive materials in groundwater near the bank between the Unit 3 and 4 intakes, a low density of radioactive materials was maintained at all Observation Holes as until September.
- The density of radioactive materials in seawater at the additional sampling point, which was installed outside the sea-side impermeable walls inside the open channels of Units 1-4 after March, was equivalent to that at the point to the north of the east breakwater.
- The density of radioactive materials in seawater within the port has been slowly declining up to September. In response to the increase in released water from the switched release channel, sampling at the new sampling point “Port center” started.
- The radioactive material density in seawater at and outside the port entrance has remained within the same range previously recorded.
- To increase the frequency of marine-trend monitoring, a seawater monitor was installed at the port entrance. Since September 4, test operation has been conducted for approximately three months to verify the data, identify troubles and check the operation.
- At the Unit 1 release channel, water having accumulated after the typhoon was investigated (October 15 and 22). The results identified a significantly higher density of cesium 137 compared to past data (120,000 Bq/L). Though the specific inflow route was not confirmed, a possible cause was inflow of contaminated soil fallout due to heavy rain during the typhoon. The monitoring frequency will be increased to prepare for purifying the accumulated water.
- Construction to cover the seabed soil within the port is underway to prevent contamination spreading due to stirred-up seabed soil (scheduled for completion at the end of FY2014). Covering over Area (1) (in front of Shallow Draft Quay) was completed (October 11) (see Figure 10). Covering over Area (2) will start on November 11 following the plant modification due to the change in covering materials (commenced from October 10 and scheduled for completion on November 10). The seabed of the intake open channels had been covered by FY2012.



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



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

Figure 7: Groundwater density on the Turbine Building east side

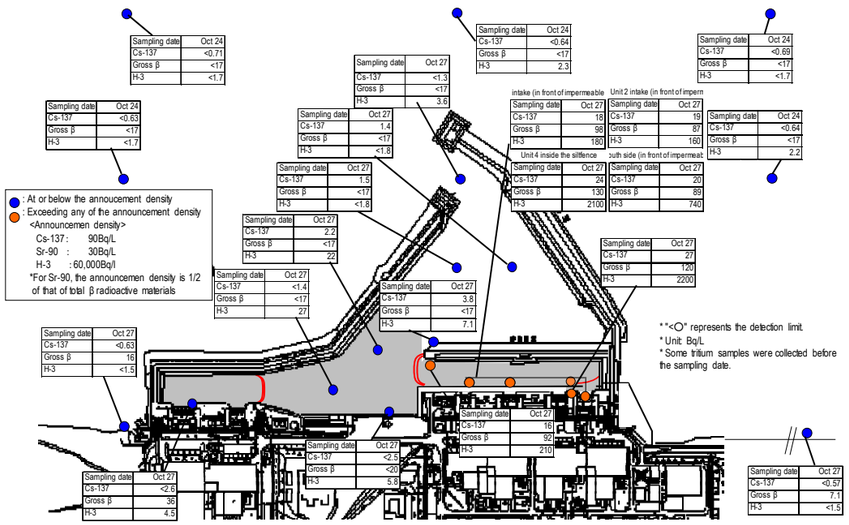


Figure 8: Seawater density around the port

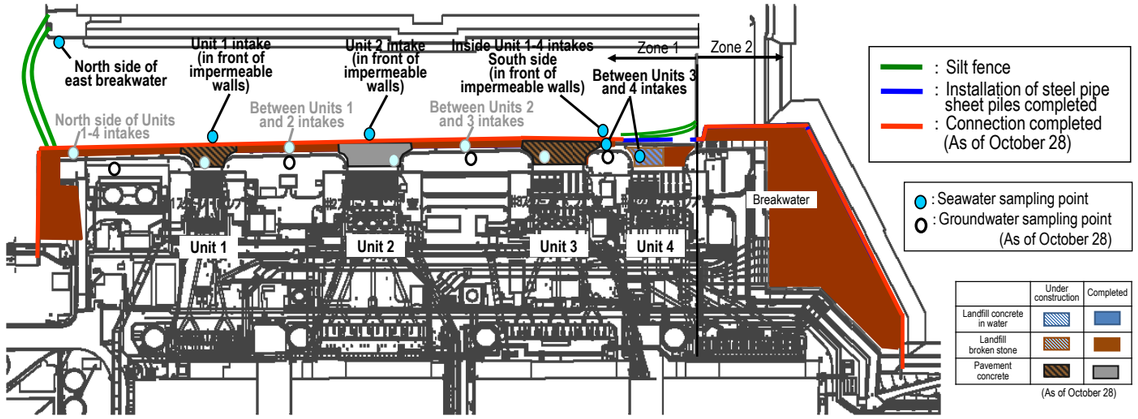


Figure 9: Progress status of the seabed soil covering within the port

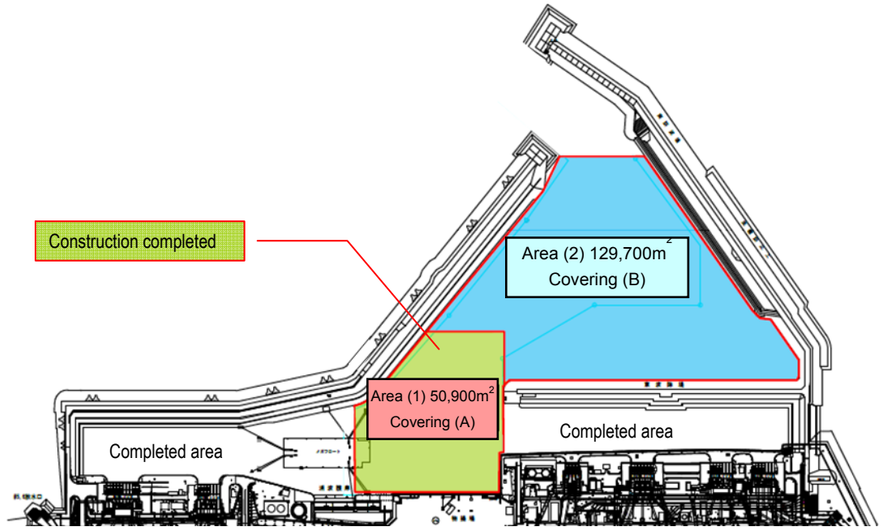


Figure 10: Progress status of the seabed soil covering within the port

4. Plan to remove fuel from the spent fuel pools

Work to help remove spent fuel from the pool is progressing steadily 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

- Fuel removal from the spent-fuel pool (SFP) commenced on November 18, 2013.
- As of October 29, 1320 of 1331 spent fuel assemblies and 22 of 202 non-irradiated fuel assemblies had been transferred to the common pool. 88% of the fuel removal was completed.
- Regarding spent fuel inside the pool, including leaking and distorted fuel assemblies, transfer to the common pool will be completed by November. Regarding non-irradiated fuel assemblies, transfer to the Unit 6 spent-fuel pool will be completed by December.
- Inspection on containers for fuel transportation from Unit 4 to the common pool was conducted (from September 13 to October 14).

➢ Verification of health of the Unit 4 Reactor Building

- To verify the health of the Reactor Building and the spent-fuel pool, the 10th regular inspection was performed (October 14-30). The inspection results of four items (“measurement of water level”, “measurement of external walls”, “visual inspection” and “verification of concrete strength”) showed that the building was not tilted as a whole and no major crack that may influence the structure strength was detected. The inspection also identified sufficient strength

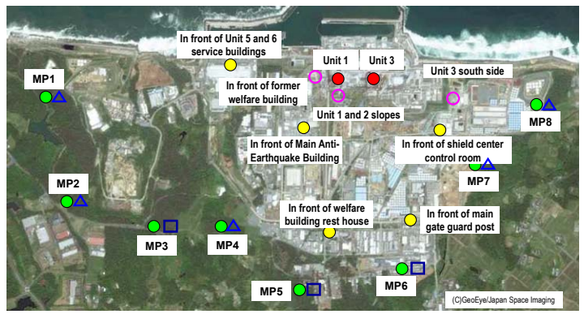
ensured in terms of concrete strength.
- The results concluded the Reactor Building and the spent-fuel pool are sufficiently quake-resistant and in a condition of being able to store spent fuel safely.

➢ Main work to help remove spent fuel at Unit 3

- During rubble removal inside the spent-fuel pool (SFP), the console and overhanging pedestal of the fuel-handling machine, which was scheduled for removal, fell (August 29).
- To prevent falling, the following measures will be implemented:
  - ✓ If the onsite and 3D images for examining the work differ, the 3D images will be corrected and the removal plan, reconsidered.
  - ✓ If required following reconsideration of the removal plan, new removal tools will be produced.
- As a measure to alleviate any potential influence of falling, a rack-cover plate will be added.

➢ Main work to help remove spent fuel at Unit 1

- To help the work on dismantling the building cover, scheduled to start at the end of FY2014, commence smoothly, anti-scattering agents are to be sprayed and an investigation, conducted in advance.
- On October 22, spraying of anti-scattering agents began from holes opened in the roof panels of the building cover.
- On October 28, while the anti-scattering agents were being sprayed, since the nozzle tip moved due to the wind, the opening of the hole expanded by approx. 1m x 2m into a triangular shape, whereupon spraying was suspended. No significant variation in the indicated values of dust monitors and monitoring posts was detected. The estimated cause of the nozzle-tip movement was a blast since the wind speed at the time was approx. 2m/s.
- One roof panel will be removed on October 31. After removing two roof panels and monitoring the dust trend for a certain period, the rubble status and dust density on the operating floor will be investigated. The removed roof panels will be temporarily returned to the roof by early December.
- Given the fact that dust was generated when rubble was removed from Unit 3 in August last year, the system for monitoring radioactive material densities has been enhanced (see Figure 11). When any significant variation is identified at monitoring posts or the dust monitors issue an alert, dismantling work will be immediately suspended, actions such as spraying anti-scattering agents will be taken, and the alert will also be notified to the relevant municipalities and the press.
- Details of the outline, risks and measures regarding the dismantling of the building cover will be informed to the relevant municipalities, residents, public and press in advance.



[Monitoring system of radioactive materials density]
- Monitoring by dust monitors on operating floors (4 points for each of Units 1 and 3)
- Monitoring by portable continuous dust monitors near Reactor Buildings (3 points)
- Monitoring by portable continuous dust monitors on site (5 points)
- Monitoring posts at site boundaries (8 points)
- Monitoring by portable continuous dust monitors around site boundaries (5 points)
- Measuring by dust samplers around site boundaries (3 points)

Figure 11: Monitoring system of radioactive material densities related to dismantling of the Unit 1 building cover

➢ Fuel removal plans for Units 1 and 2

- The Mid- and Long-Term Roadmap revised in June 2013 specifies that multiple plans for each Unit shall be prepared and examined. The roadmap sets the “Judgment Point” to narrow options, modify and change the plans to the 1st half of FY2014 for both Units 1 and 2.
- The results of the examination, including a plan dedicated to removing fuel from within the spent-fuel pool, which was added to allow a flexible response to diversified consideration of methods for fuel-debris removal, are as follows:
- Regarding Unit 1, there is a risk of rubble falling in the pool and influence the fuel. From the perspective of reducing risks throughout the power station by removing fuel early, a plan to build a structure dedicated to fuel removal inside the spent-fuel pool was selected (see Figure 12).
- Regarding Unit 2, a plan dedicated to removing fuel from the pool and a further plan to remove fuel debris using the same structure continued to be examined, to assess the feasibility of preventing dust scattering and removing further fuel ahead of schedule, including diversion of the Reactor Building, during the period for preparing a yard and the time which may not affect the start period for fuel removal.

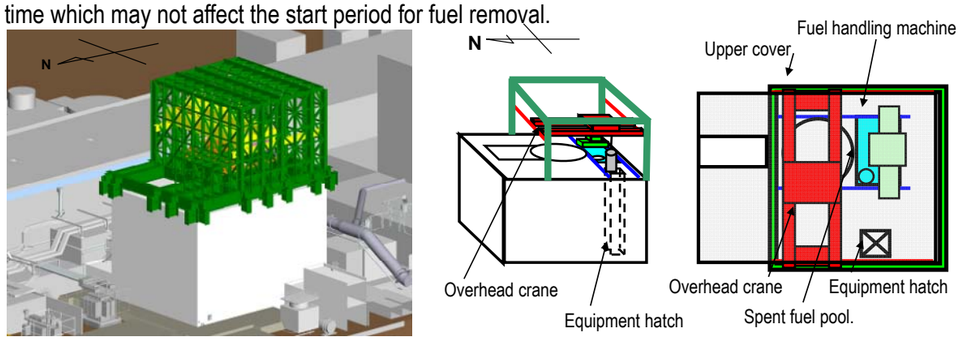


Figure 12: Plan image of Unit-1 fuel removal

5. Fuel debris removal plan

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

➢ 3D laser scan inside the Unit 1 torus room

- To use in evaluating obstacles as required for works, including water stoppage at the PCV inside the Unit 1 Reactor Building torus room, which is currently being planned, 3D data in the torus room will be collected using remote-controlled equipment with 3D laser-measurement equipment mounted (commenced on October 31 and scheduled for completion on November 10) (see Figure 13.)

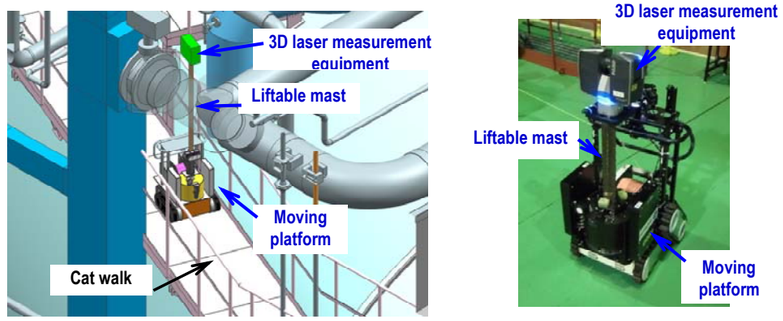


Figure 13: 3D laser scan measurement image at Unit 1 torus room and external appearance of remote-controlled equipment

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

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

➢ Management status of rubble and trimmed trees

- As of the end of September, the total storage volume of concrete and metal rubble was approx. 115,200 m^3 (+4,000 m^3 compared to at the end of August, area-occupation rate: 68%). The total storage volume of trimmed trees was approx. 79,700 m^3 (+700 m^3 compared to at the end of August, area-occupation rate: 58%). The increase in rubble was mainly attributable to construction to install tanks and impermeable walls with frozen soil. The increase in trimmed trees was mainly attributable to construction to install tanks and onsite facing.

➢ Management status of secondary waste from water treatment

- As of October 28, the total storage volume of waste sludge was 597 m^3 (area-occupation rate: 85%). The total number of stored spent vessels and high-integrity containers (HIC) of multi-nuclide removal equipment was 1,167 (area-occupation rate: 46%).

7. Plan for staffing and ensuring work safety

Securing appropriate staff 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 total of people registered for at least one day per month to work on site during the past quarter from June to August was approx. 13,100 (TEPCO and partner company workers), which exceeded the monthly average number of actual workers (approx. 10,100). Accordingly, sufficient people are registered to work on site.
- It was confirmed with the prime contractors that the estimated manpower necessary for the work in November (approx. 6,310 per day: TEPCO and partner company workers)* would be secured at present. The average numbers of workers per day for each month of the last fiscal year (actual values) were maintained with approx. 3,000 to 6,400 per month since the last fiscal year (See Figure 14).

  * Some works for which contract procedures have yet to be completed are excluded from the November estimate.
- The number of workers is increasing, both from within and outside Fukushima prefecture. However, as the growth rate of workers from outside exceeds that of those from within the prefecture, the local employment ratio (TEPCO and partner company workers) as of September was approx. 45%.

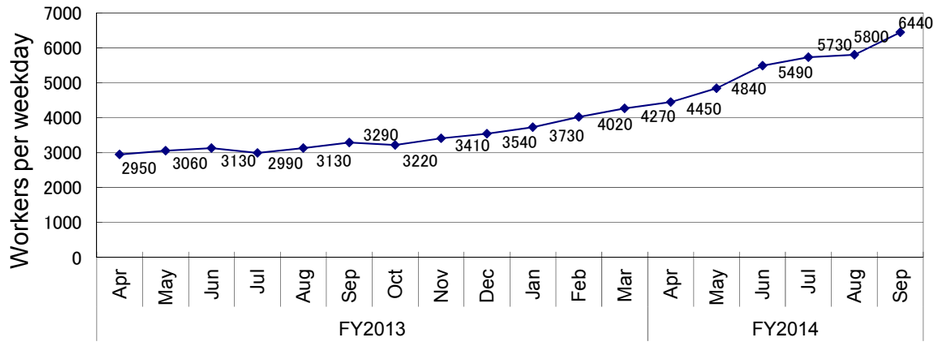


Figure 14: Changes in the average number of workers per weekday for each month since FY2013 (actual values)

- The average exposure dose of workers remained at approx. 1mSv/month by implementing measures to reduce the exposure dose, and allocating/relocating workers as required based on the forecast dose for each work. (Reference: annual average exposure dose 20mSv/year≒1.7mSv/month)
- For most workers, the exposure dose is sufficiently within the limit and at a level which allows them to continue engaging in radiation work.

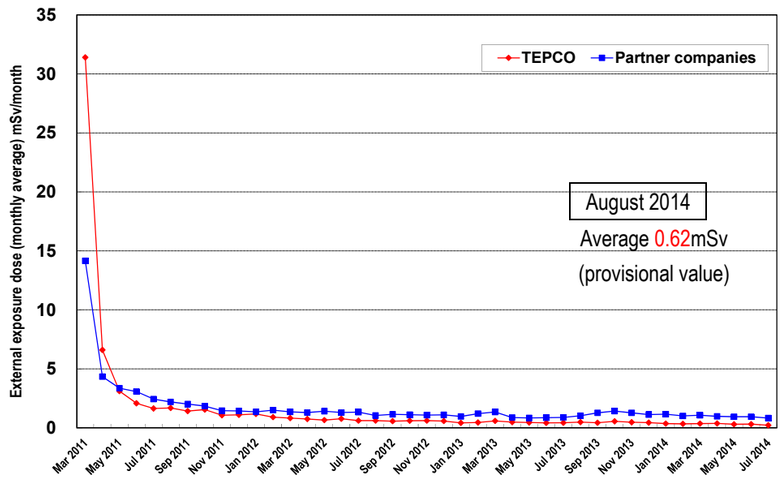


Figure 15: Changes in monthly individual worker exposure dose
(monthly average exposure dose since March 2011)

➢ Expansion of work areas for women

- Regarding female workers engaging in radioactivity-related jobs at the Fukushima Daiichi Nuclear Power Station, there has been no onsite work area since the East Japan Great Earthquake due to the increased radioactivity rate. However, based on improved work-environment conditions, female workers have been allowed to work in limited onsite areas since June 2012.
- Based on the improved onsite work environment and the reduced potential for internal exposure, work areas for female workers will be expanded site-wide, excluding specified high-dose works, and those for which the radiation dose exceeds 4mSv per single exposure (from November 4).

8. Others

➢ 5th meeting of the Fukushima Advisory Board on Decommissioning and Contaminated Water Management

- On October 20, the 5th meeting was held (Fukushima City), where the efforts to provide information, the current decommissioning status and measures for contaminated water were introduced. Opinions concerning how to improve motivation among workers and the development of a system considering those planning to return were delivered. Regarding the Mid- and Long-Term Roadmap (revised in June this year), it was announced that examination for revision would start based on advice from the Fukushima Advisory Board on Decommissioning and Contaminated Water Management and the formulation of a Strategy Plan (tentative) by the Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF) (established in August this year).

➢ Implementers of the decommissioning project (METI FY2013 supplementary budget) were decided

- Request for proposal (RFP) were made regarding conceptual study of innovative approach for fuel debris retrieval and feasibility study of essential technologies (offering period: June 27 – August 27).
- Following screening by the review board, comprising external experts, 11 proposals* were adopted on October 3.

  * Conceptual studies on innovative approach for fuel debris retrieval: 4, feasibility studies on visual/measurement technologies: 4, feasibility studies on cutting/dust- collection technologies: 3

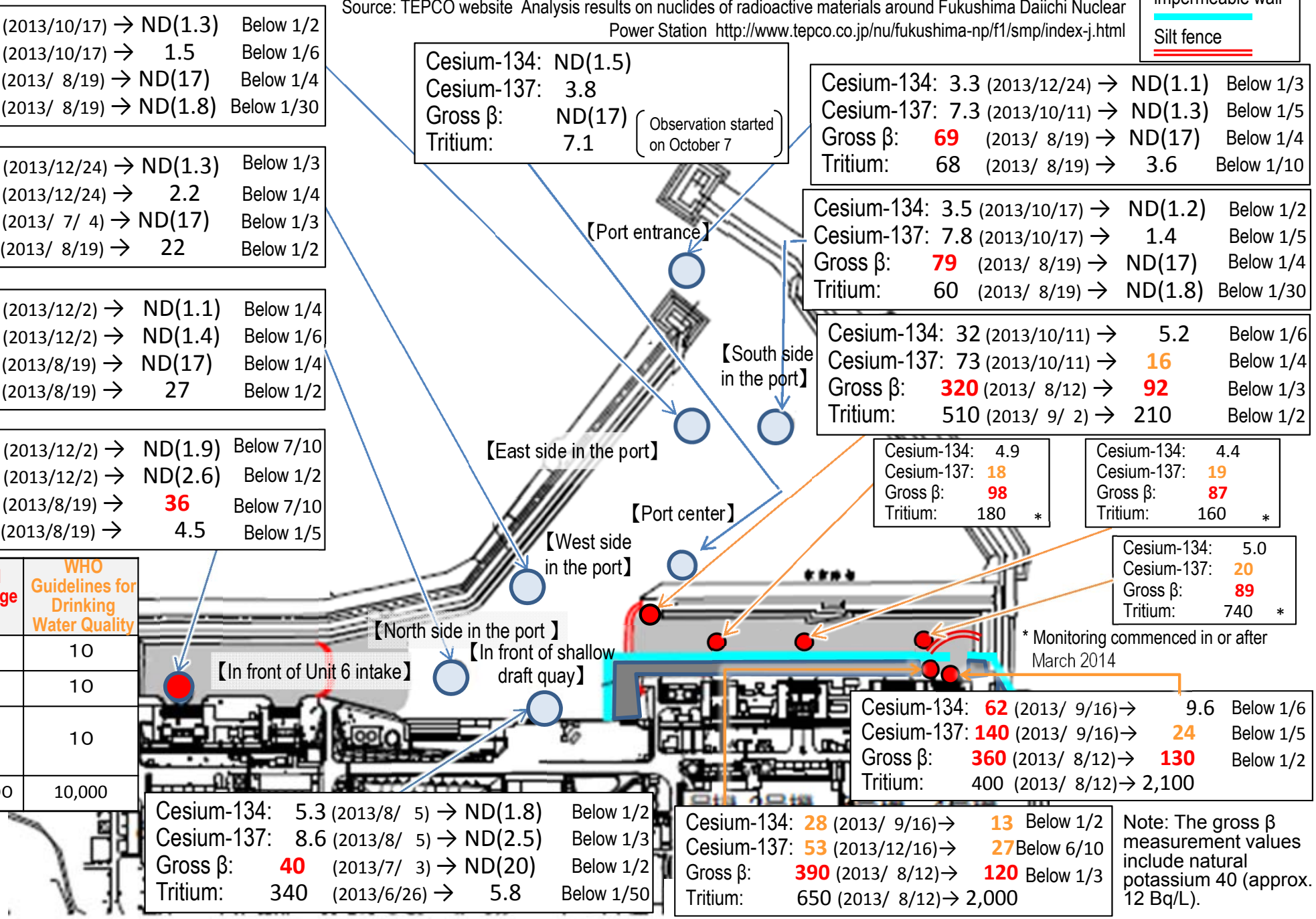
Status of seawater monitoring within the port (comparison between the highest values in 2013 and the latest values)

"The highest value" → "the latest value (sampled during October 20-27)"; unit (Bq/L); ND represents a value below the detection limit

Source: TEPCO website Analysis results on nuclides of radioactive materials around Fukushima Daiichi Nuclear Power Station http://www.tepco.jp/nu/fukushima-np/f1/smp/index-j.html

Sea side impermeable wall

Silt fence



Cesium-134: 3.3 (2013/10/17) → ND(1.3) Below 1/2
Cesium-137: 9.0 (2013/10/17) → 1.5 Below 1/6
Gross β: 74 (2013/ 8/19) → ND(17) Below 1/4
Tritium: 67 (2013/ 8/19) → ND(1.8) Below 1/30

Cesium-134: ND(1.5)
Cesium-137: 3.8
Gross β: ND(17)
Tritium: 7.1
(Observation started on October 7)

Cesium-134: 3.3 (2013/12/24) → ND(1.1) Below 1/3
Cesium-137: 7.3 (2013/10/11) → ND(1.3) Below 1/5
Gross β: 69 (2013/ 8/19) → ND(17) Below 1/4
Tritium: 68 (2013/ 8/19) → 3.6 Below 1/10

Cesium-134: 4.4 (2013/12/24) → ND(1.3) Below 1/3
Cesium-137: 10 (2013/12/24) → 2.2 Below 1/4
Gross β: 60 (2013/ 7/ 4) → ND(17) Below 1/3
Tritium: 59 (2013/ 8/19) → 22 Below 1/2

Cesium-134: 3.5 (2013/10/17) → ND(1.2) Below 1/2
Cesium-137: 7.8 (2013/10/17) → 1.4 Below 1/5
Gross β: 79 (2013/ 8/19) → ND(17) Below 1/4
Tritium: 60 (2013/ 8/19) → ND(1.8) Below 1/30

Cesium-134: 5.0 (2013/12/2) → ND(1.1) Below 1/4
Cesium-137: 8.4 (2013/12/2) → ND(1.4) Below 1/6
Gross β: 69 (2013/8/19) → ND(17) Below 1/4
Tritium: 52 (2013/8/19) → 27 Below 1/2

Cesium-134: 32 (2013/10/11) → 5.2 Below 1/6
Cesium-137: 73 (2013/10/11) → 16 Below 1/4
Gross β: 320 (2013/ 8/12) → 92 Below 1/3
Tritium: 510 (2013/ 9/ 2) → 210 Below 1/2

Cesium-134: 2.8 (2013/12/2) → ND(1.9) Below 7/10
Cesium-137: 5.8 (2013/12/2) → ND(2.6) Below 1/2
Gross β: 46 (2013/8/19) → 36 Below 7/10
Tritium: 24 (2013/8/19) → 4.5 Below 1/5

Cesium-134: 4.9
Cesium-137: 18
Gross β: 98
Tritium: 180 *

Cesium-134: 4.4
Cesium-137: 19
Gross β: 87
Tritium: 160 *

Cesium-134: 5.0
Cesium-137: 20
Gross β: 89
Tritium: 740 *

* Monitoring commenced in or after March 2014

	Legal discharge limit	WHO Guidelines for Drinking Water Quality
Cesium-134	60	10
Cesium-137	90	10
Strontium-90 (strongly correlate with Gross β)	30	10
Tritium	60, 000	10,000

Summary of TEPCO data as of October 29

Cesium-134: 5.3 (2013/8/ 5) → ND(1.8) Below 1/2
Cesium-137: 8.6 (2013/8/ 5) → ND(2.5) Below 1/3
Gross β: 40 (2013/7/ 3) → ND(20) Below 1/2
Tritium: 340 (2013/6/26) → 5.8 Below 1/50

Cesium-134: 62 (2013/ 9/16)→ 9.6 Below 1/6
Cesium-137: 140 (2013/ 9/16)→ 24 Below 1/5
Gross β: 360 (2013/ 8/12)→ 130 Below 1/2
Tritium: 400 (2013/ 8/12)→ 2,100

Cesium-134: 28 (2013/ 9/16)→ 13 Below 1/2
Cesium-137: 53 (2013/12/16)→ 27 Below 6/10
Gross β: 390 (2013/ 8/12)→ 120 Below 1/3
Tritium: 650 (2013/ 8/12)→ 2,000

Note: The gross β measurement values include natural potassium 40 (approx. 12 Bq/L).

Status of seawater monitoring around outside of the port
(comparison between the highest values in 2013 and the latest values)

(The latest values sampled during October 20-27)

Unit (Bq/L); ND represents a value below the detection limit; values in ( ) represent the detection limit; ND (2013) represents ND throughout 2013

	Legal discharge limit	WHO Guidelines for Drinking Water Quality
Cesium-134	60	10
Cesium-137	90	10
Strontium-90 (strongly correlate with Gross β)	30	10
Tritium	60,000	10,000

【Northeast side of port entrance(offshore 1km)】

Cesium-134: ND (2013) → ND (0.67)
Cesium-137: ND (2013) → ND (0.71)
Gross β: ND (2013) → ND (17)
Tritium: ND (2013) → ND (1.7)

【East side of port entrance (offshore 1km)】

Cesium-134: ND (2013) → ND (0.70)
Cesium-137: 1.6 (2013/10/18) → ND (0.64) Below 1/2
Gross β: ND (2013) → ND (17)
Tritium: 6.4 (2013/10/18) → ND 2.3 Below 1/2

【Southeast side of port entrance(offshore 1km)】

Cesium-134: ND (2013) → ND (0.63)
Cesium-137: ND (2013) → ND (0.69)
Gross β: ND (2013) → ND (17)
Tritium: ND (2013) → ND (1.7)

Cesium-134: ND (2013) → ND (0.67)
Cesium-137: ND (2013) → ND (0.63)
Gross β: ND (2013) → ND (17)
Tritium: 4.7 (2013/ 8/18) → ND (1.7) Below 1/2

【North side of north breakwater(offshore 0.5km)】

【Port entrance】

【South side of south breakwater(offshore 0.5km)】

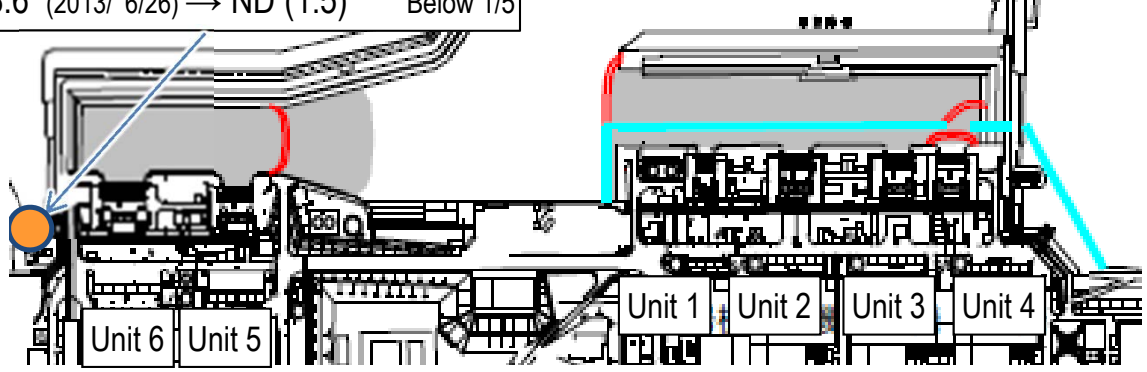
Cesium-134: ND (2013) → ND (0.63)
Cesium-137: ND (2013) → ND (0.64)
Gross β: ND (2013) → ND (17)
Tritium: ND (2013) → 2.2

Cesium-134: 3.3 (2013/12/24) → ND (1.1) Below 1/3
Cesium-137: 7.3 (2013/10/11) → ND (1.3) Below 1/5
Gross β: 69 (2013/ 8/19) → ND (17) Below 1/4
Tritium: 68 (2013/ 8/19) → 3.6 Below 1/10

【North side of Units 5 and 6 discharge channel】

Cesium-134: 1.8 (2013/ 6/21) → ND (0.52) Below 1/3
Cesium-137: 4.5 (2013/ 3/17) → ND (0.63) Below 1/7
Gross β: 12 (2013/12/23) → 16
Tritium: 8.6 (2013/ 6/26) → ND (1.5) Below 1/5

Cesium-134: ND (2013) → ND (0.54)
Cesium-137: 3.0 (2013/ 7/15) → ND (0.57) Below 1/5
Gross β: 15 (2013/12/23) → 7.1 Below 1/2
Tritium: 1.9 (2013/11/25) → ND (1.5) Below 8/10



Sea side impermeable wall

Silt fence

【Around south discharge channel】

Note: The gross β measurement values include natural potassium 40 (approx. 12 Bq/L).

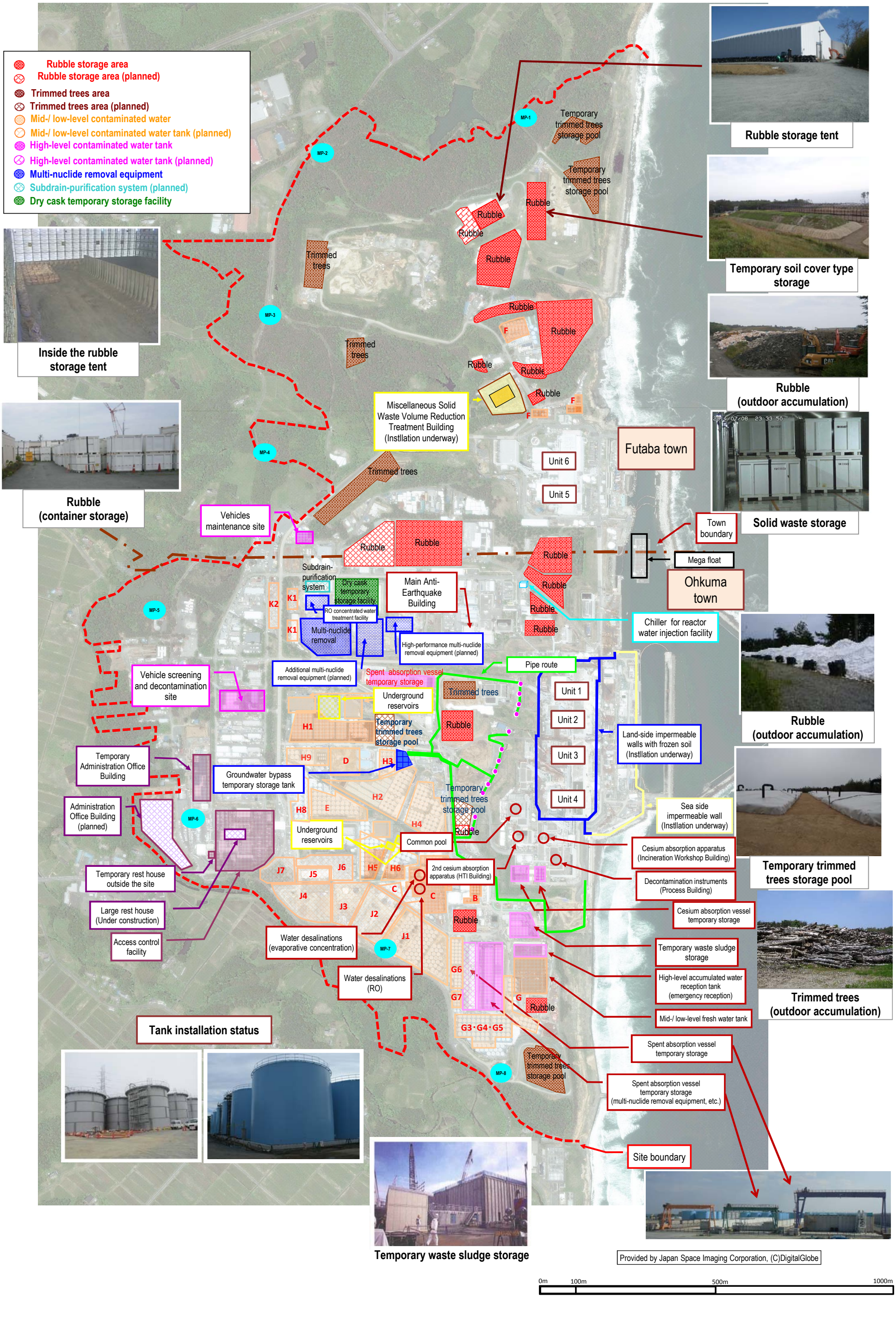
Summary of TEPCO data as of October 29

Source: TEPCO website, Analysis results on nuclides of radioactive materials around Fukushima Daiichi Nuclear Power Station, http://www.tepco.co.jp/nu/fukushima-np/f1/smp/index-j.html

Appendix 2

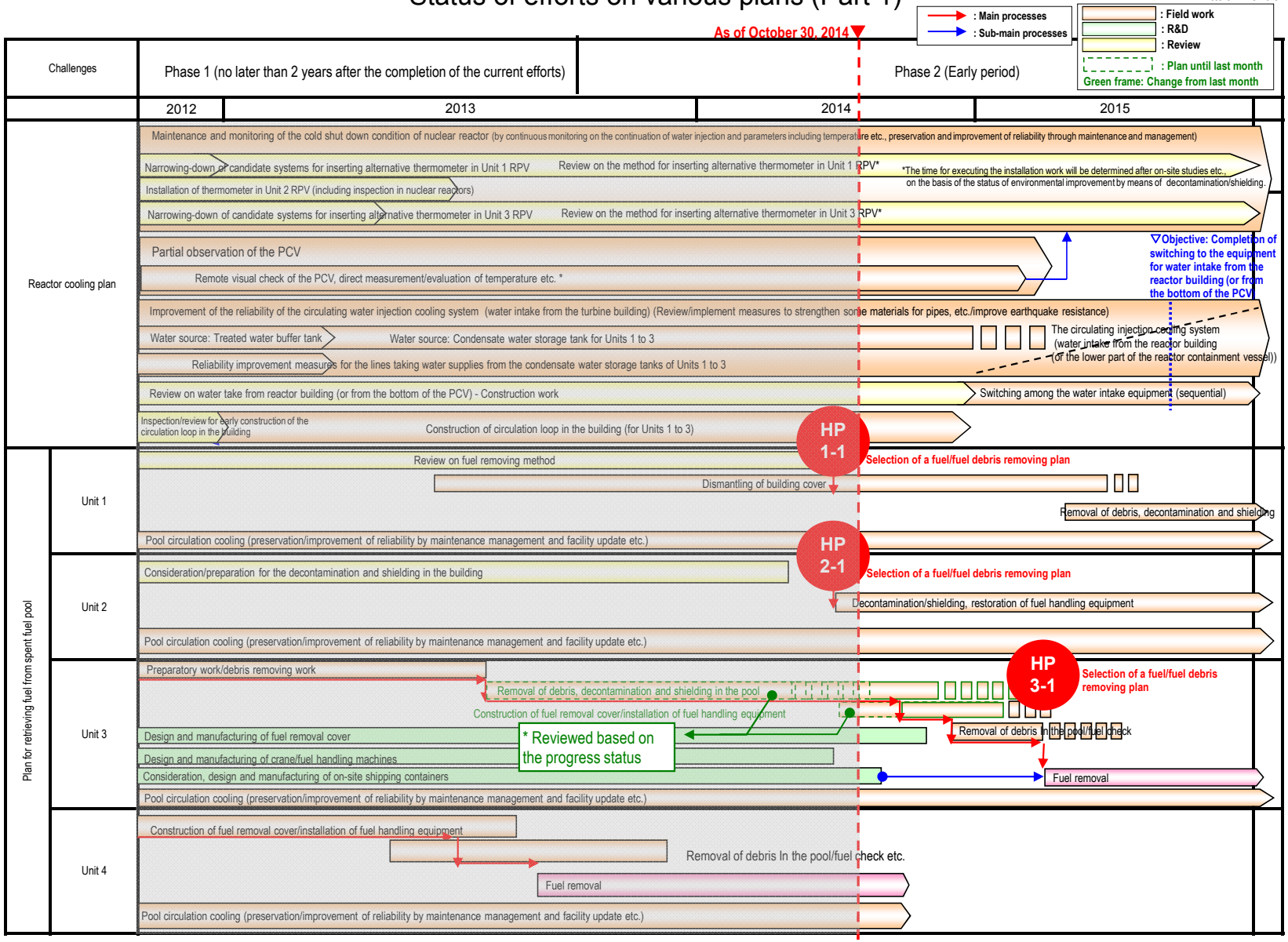
October 30, 2014

TEPCO Fukushima Daiichi Nuclear Power Station Site Layout

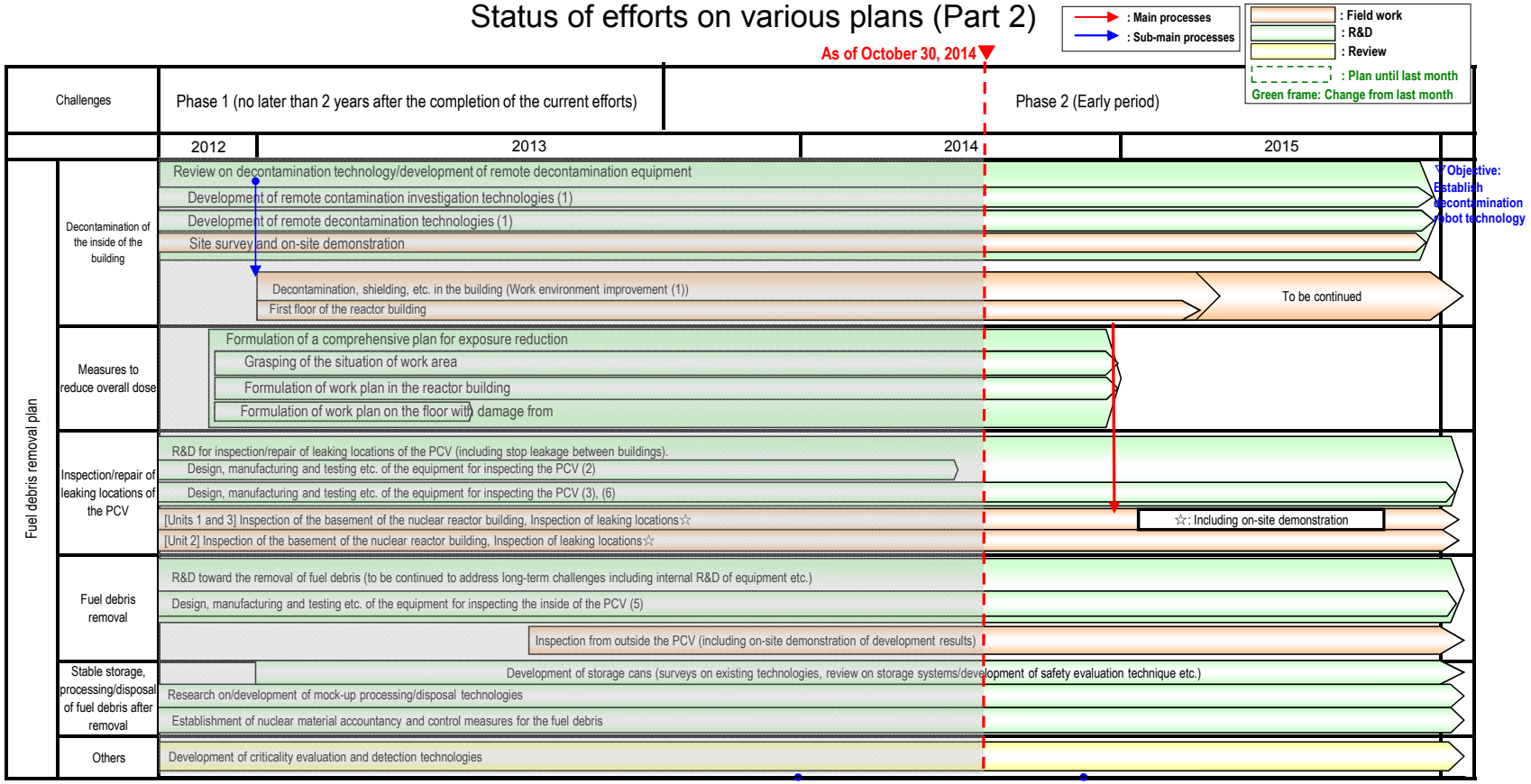


Attachment 3

Status of efforts on various plans (Part 1)



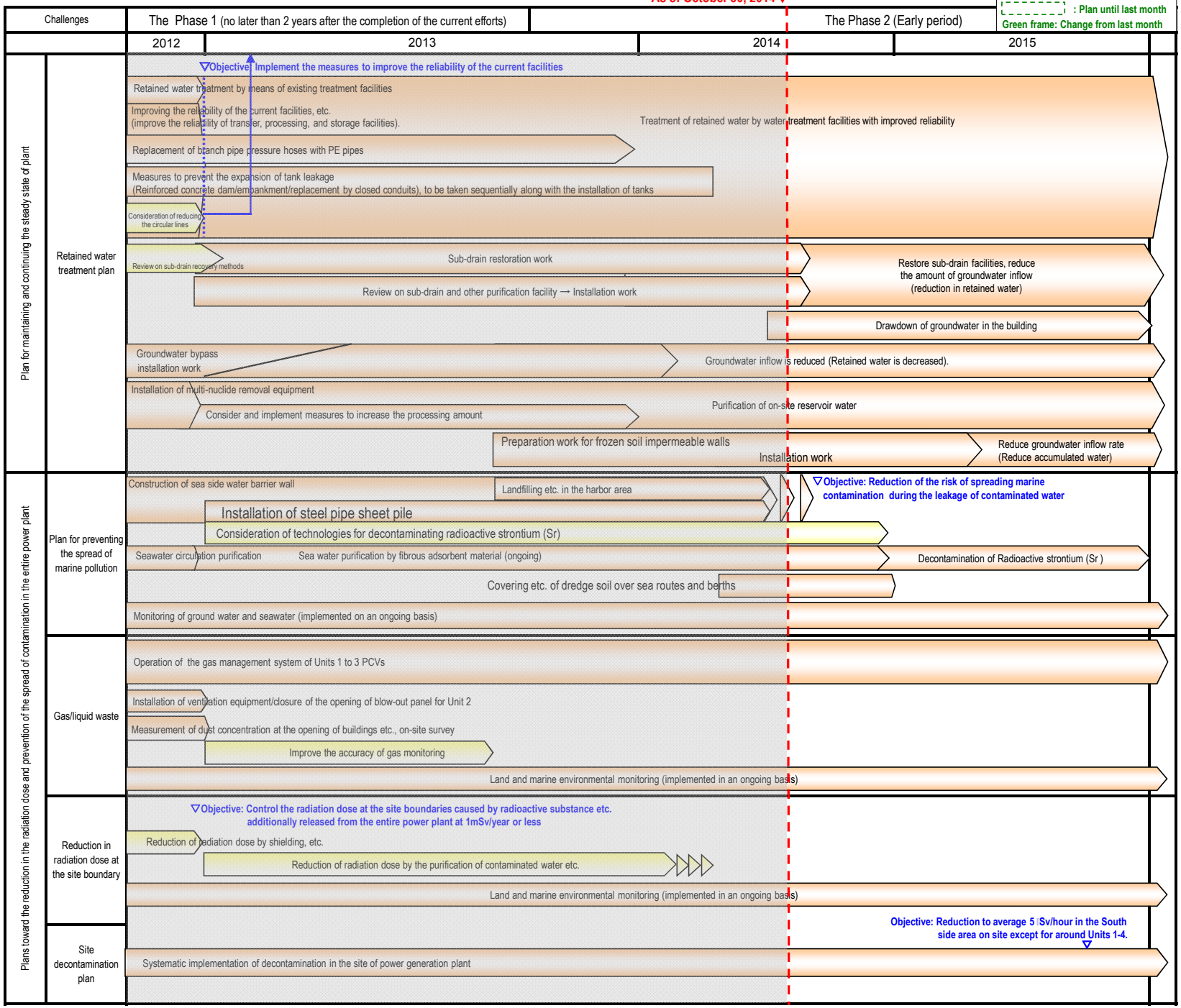
Status of efforts on various plans (Part 2)



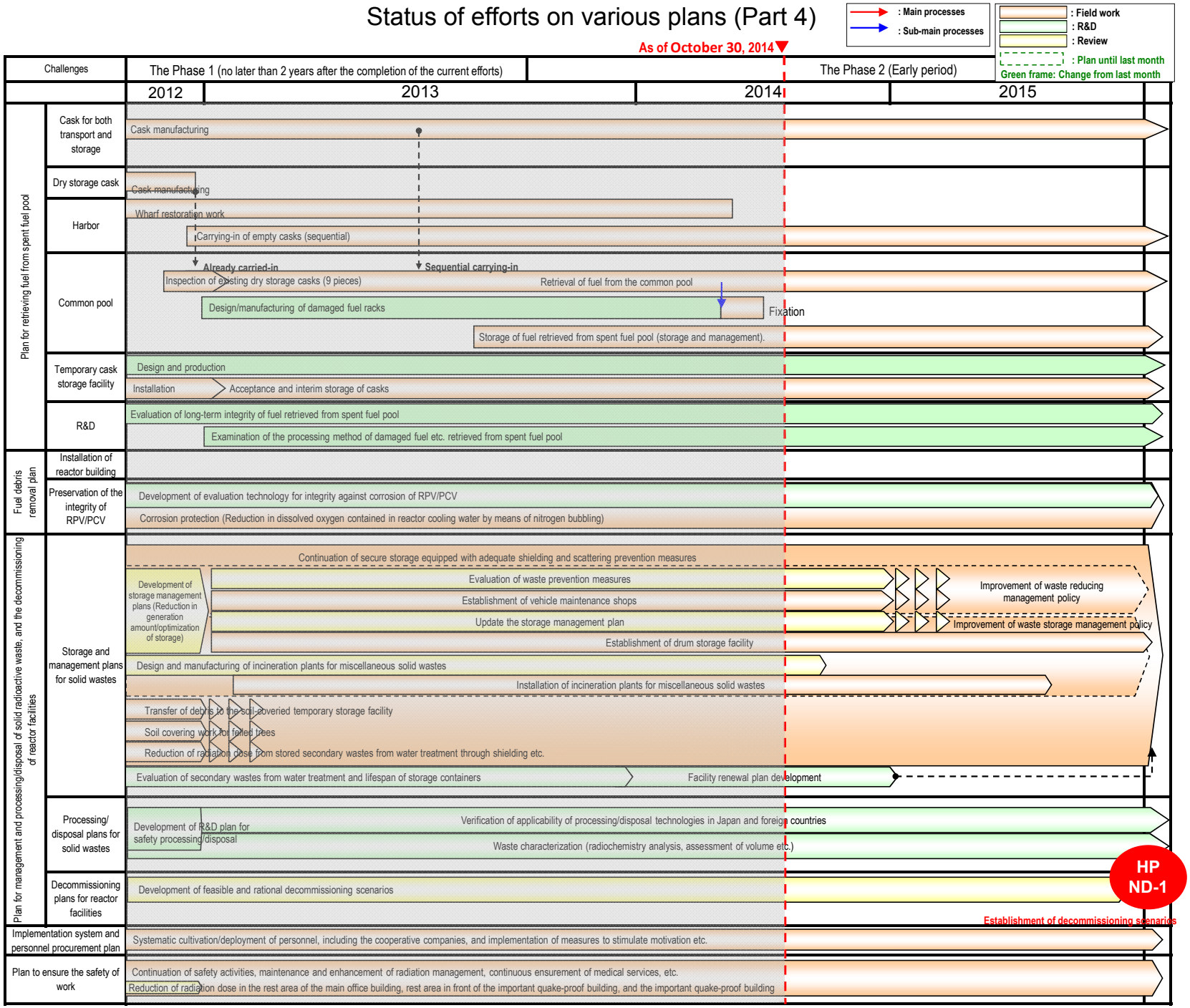
Status of efforts on various plans (Part 3)

: Main processes
: Sub-main processes
: Field work
: R&D
: Review
: Plan until last month
Green frame: Change from last month

As of October 30, 2014



Status of efforts on various plans (Part 4)



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 involved commencing 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.

As of October 29, 1,320 of 1,331 spent fuel assemblies and 22 of 202 new fuel assemblies had been transferred to the common pool, meaning 88% of the removal has been completed to date.

Transfer of spent fuel will be completed with the next transfer.

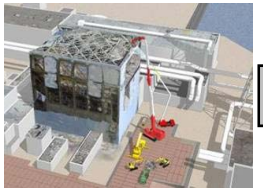
Non-irradiated fuel assemblies will be transferred to Unit 6 SFP by December.

Fuel removal status

Loading the transportation container onto the trailer

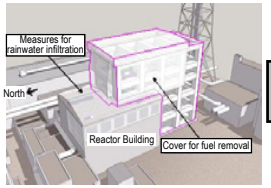
Work is proceeding with appropriate risk countermeasures, careful checks and safety first

Steps toward fuel removal



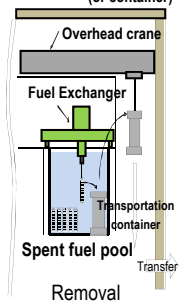
Removal of rubble from the roof of the Reactor Building

Completed in Dec. 2012



Installation of cover for fuel removal

From Apr. 2012, completed in Nov. 2013

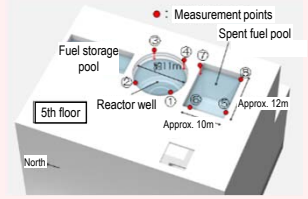


Removal

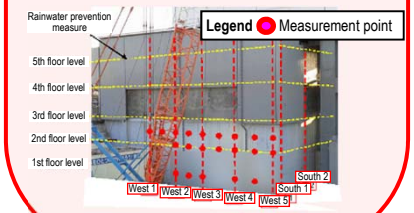
Commenced in Nov. 2013

Check of the soundness of the Reactor Building

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



Check for tilt (measurement of the water level)



Check for tilt (measurement of the external wall)

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

Unit 3

To facilitate the installation of a cover for fuel removal, installation of the gantry was completed (March 13, 2013). Removal of rubble from 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 machine on the operating floor (*1), measures to reduce the radiation dose (decontamination and shielding) are underway (from October 15, 2013). Removal of large rubble from the SFP is also underway (from December 17, 2013).

Before removal of the large rubble

After removal of the large rubble

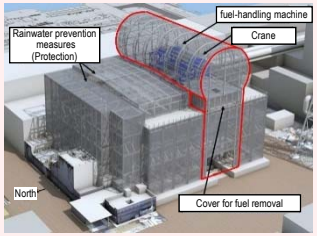


Image of the cover for fuel removal

Units 1 and 2

- Regarding Unit 1, to remove rubble from the top of the operating floor, there are plans to dismantle the cover over the Reactor Building.

On October 22, spraying of anti-scattering agents began from holes opened in the roof panels of the building cover. When the building cover is dismantled and the rubble removed, sufficient measures to prevent radioactive materials from scattering have been taken and monitoring conducted.

- Regarding Unit 2, to prevent risks of reworking due to change in the fuel debris removal plan, the plan continues to be examined within a scope not affecting the scheduled commencement of removal.

Dismantling of the cover over Reactor Building Unit 1

To facilitate the early removal of fuel and fuel debris from the SFP, the cover over the Reactor Building will be dismantled to accelerate the removal of rubble on the operation floor. The radiation dose on the site boundaries will also increase compared to before the dismantling. However, through measures to reduce the release, the estimated impact of the release from Units 1 to 3 on the site boundaries (0.03mSv/year) will be limited.

①Spraying anti-scattering agents

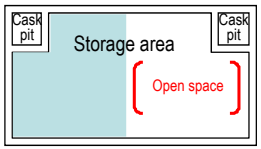
②Removing dust and dirt by suctioning devices

③Preventing dust from being stirred up via a windbreak sheet system by installing additional monitors

④ Enhancing the dust-monitoring

Measures to reduce release

Common pool

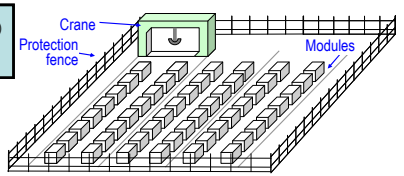


An open space will be maintained in the common pool (Transfer to the temporary dry cask storage facility)

Progress to date

- The common pool has been restored to a condition allowing it to 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, 2013); fuel stored in the common pool 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 the core internals are inspected.
(*2) Cask: Transportation container for samples and equipment, including radioactive materials.

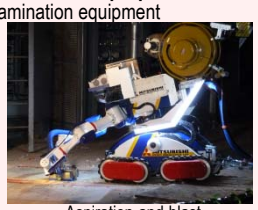
Progress toward decommissioning: Works to identify the plant status and toward fuel debris removal

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

Demonstration of decontamination equipment

(1) Demonstration of suction and blast decontamination equipment

- Demonstration was conducted on the 1st floor of Unit 1 Reactor Building (from January 30 to February 4). The result showed that the β ray dose rate was reduced by removing dust through aspiration decontamination and the coated surface was shaved by the subsequent blast decontamination.



Aspiration and blast decontamination equipment

(2) Dry ice-blast decontamination equipment

- A demonstration was conducted on the 1st floor of the Unit 2 Reactor Building (from April 15-21).

Dry ice blast decontamination equipment

(3) High-pressure water decontamination equipment

- A demonstration was conducted on the 1st floor of Unit 1 Reactor Building (from April 23-29).

High-pressure water decontamination equipment

* Blast decontamination: A method to shave the surface by injecting polygonal steel grains into the object to be decontaminated (floor surface)

Investigation in the leak point detected in the upper part of Unit 1 Suppression Chamber (S/C(*1))

Investigation in the leak point detected in the upper part of Unit 1 S/C from May 27 from one expansion joint cover among the lines installed there. As no leakage was identified from other parts, specific methods will be examined to halt the flow of water and repair the PCV.

Leak point

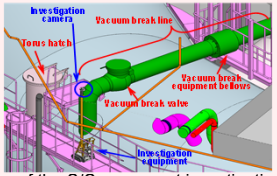
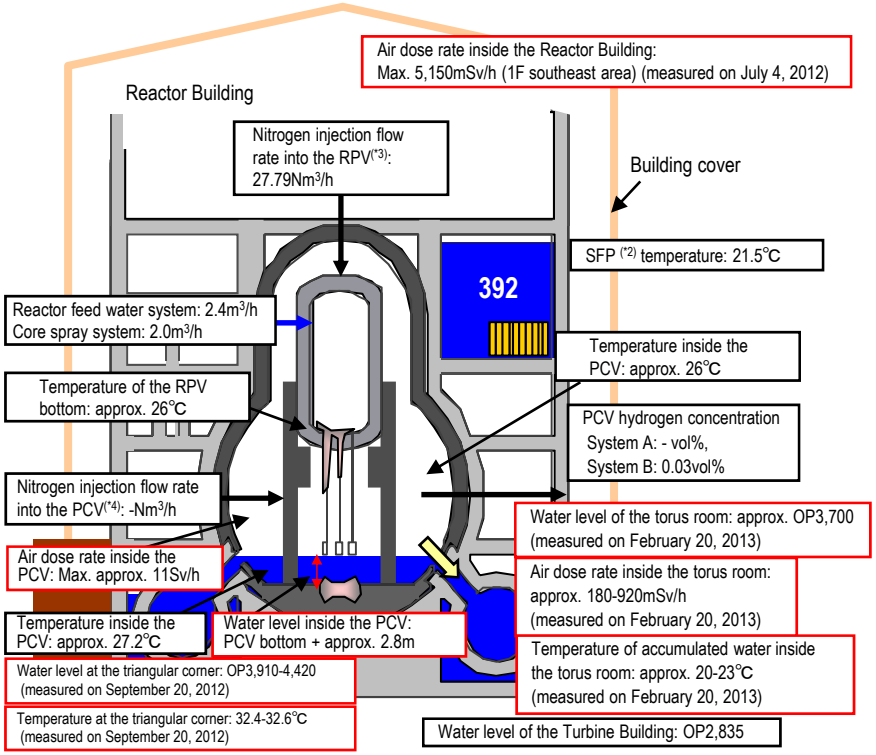


Image of the S/C upper part investigation

Unit 1



* Indices related to the plant are values as of 11:00, October 29, 2014

Status of equipment development toward investigating inside the PCV

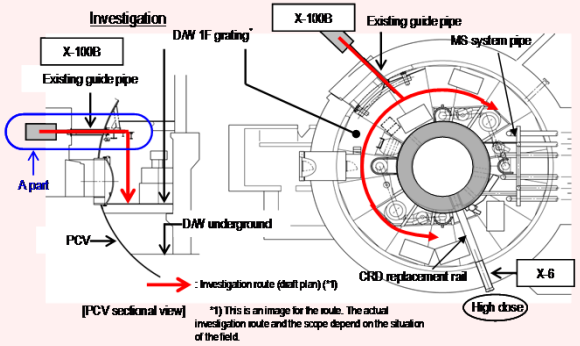
Prior to removing fuel debris, to check the conditions inside the Primary Containment Vessel (PCV), including the location of the fuel debris, investigation inside the PCV is scheduled.

[Investigative outline]

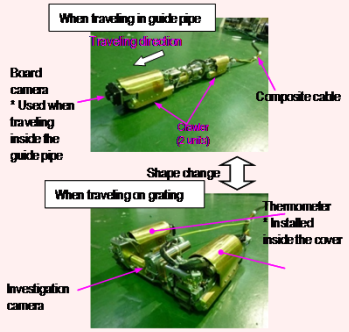
- Inserting equipment from Unit 1 X-100B penetration(*5) to investigate in clockwise and counter-clockwise directions.

[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 stably move on the grating is currently under development. A field demonstration is scheduled for the 2nd half of FY2014.



Investigative 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)
(*5) Penetration: Through-hole of the PCV

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

October 30, 2014
Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment

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

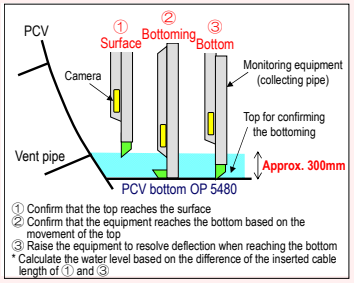
Installation of an RPV thermometer and permanent PCV supervisory instrumentation

(1) Replacement of the RPV thermometer

- As the thermometer installed at the Unit 2 RPV bottom after the earthquake had broken, it was excluded from the monitoring thermometers (February 19).
- On April 17, removal of the broken thermometer failed and was suspended. Toward removal of the thermometer the onsite method is currently selected through a test. The removal will be impermanent around December to January 2015.

(2) Reinstallation of the PCV thermometer and water-level gauge

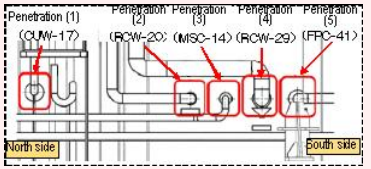
- Some of the permanent supervisory instrumentation for PCV could not be installed in the planned locations due to interference with existing grating (August 13, 2013).
- The instrumentation was removed on May 27, 2014 and new instruments were reinstalled on June 5 and 6. The trend of added instrumentation will be monitored for approx. one month to evaluate its validity.
- The measurement during the installation confirmed that the water level inside the PCV was approx. 300mm from the bottom.



Method to measure water levels when re-installing monitoring instrumentation for Unit 2 PCV

Investigative results on torus room walls

- The torus room walls were investigated (on the north side of the east-side walls) using equipment specially developed for that purpose (a swimming robot and a floor traveling robot).
- At the east-side wall pipe penetrations (five points), "the status" and "existence of flow" were checked.
- A demonstration using the above two types of underwater wall investigative equipment showed how the equipment could check the status of penetration.
- Regarding Penetrations 1 - 5, the results of checking the sprayed tracer (*5) by camera showed no flow around the penetrations. (investigation by the swimming robot)
- Regarding Penetration 3, a sonar check showed no flow around the penetrations. (investigation by the floor traveling robot)



Penetrations investigated

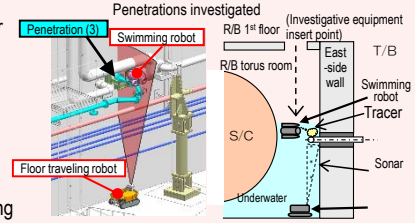
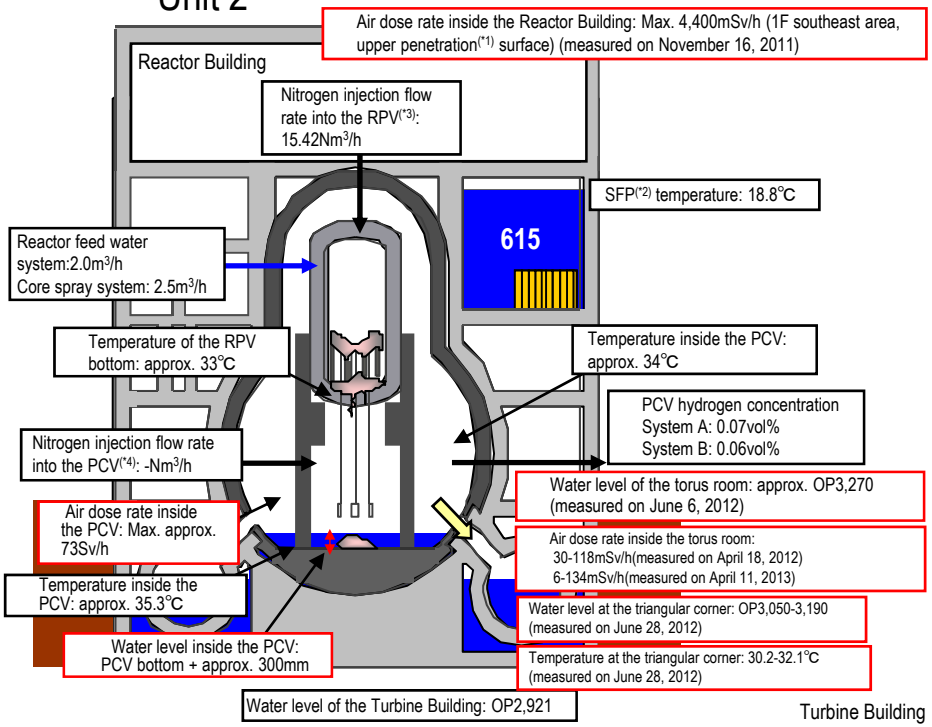


Image of the torus room east-side cross-sectional investigation

Unit 2



* Indices related to plant are values as of 11:00, October 29, 2014

Status of equipment development toward investigating inside the PCV

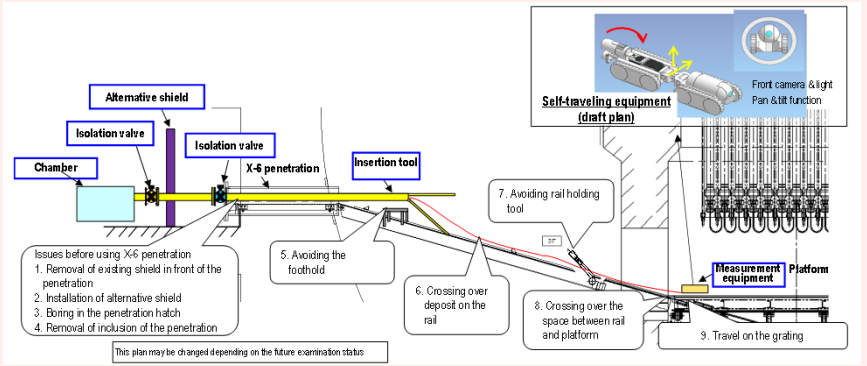
Prior to removing fuel debris, to check the conditions inside the Primary Containment Vessel (PCV), including the location of the fuel debris, investigations inside the PCV are scheduled.

[Investigative outline]

- Inserting the equipment from Unit 2 X-6 penetration(*1) and accessing inside the pedestal using the CRD rail to conduct investigation.

[Status of investigative equipment development]

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



Investigative issues 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) Tracer: Material used to trace the fluid flow. Clay particles

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

October 30, 2014
Secretariat of the Team for Countermeasures for Decommissioning and Contaminated Water Treatment
4/6

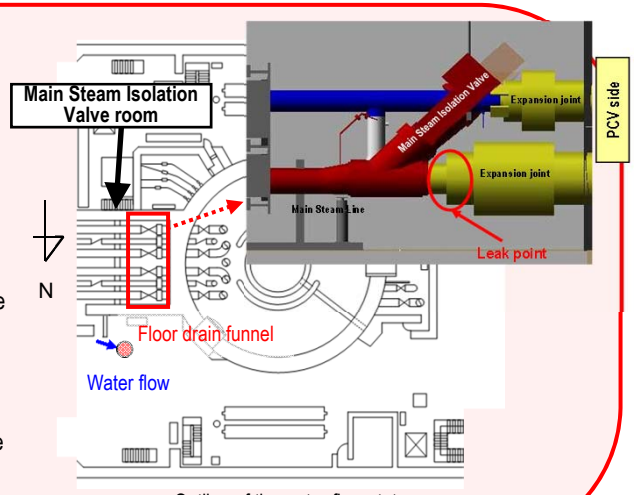
Immediate target	Identify the plant status and commence R&D and decontamination toward fuel debris removal

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

On January 18, a flow of water 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.

From April 23, image data has been acquired by camera and the radiation dose measured via pipes for measurement instrumentation, which connect the air-conditioning room on the Reactor Building 2nd floor with the Main Steam Isolation Valve Room on the 1st floor. On May 15, water flow from the expansion joint of one Main Steam Line was detected.

This is the first leak from PCV detected in Unit 3. Based on the images collected in this investigation, the leak volume will be estimated and the need for additional investigations will be examined. The investigative results will also be utilized to examine water stoppage and PCV repair methods.



Outline of the water-flow status

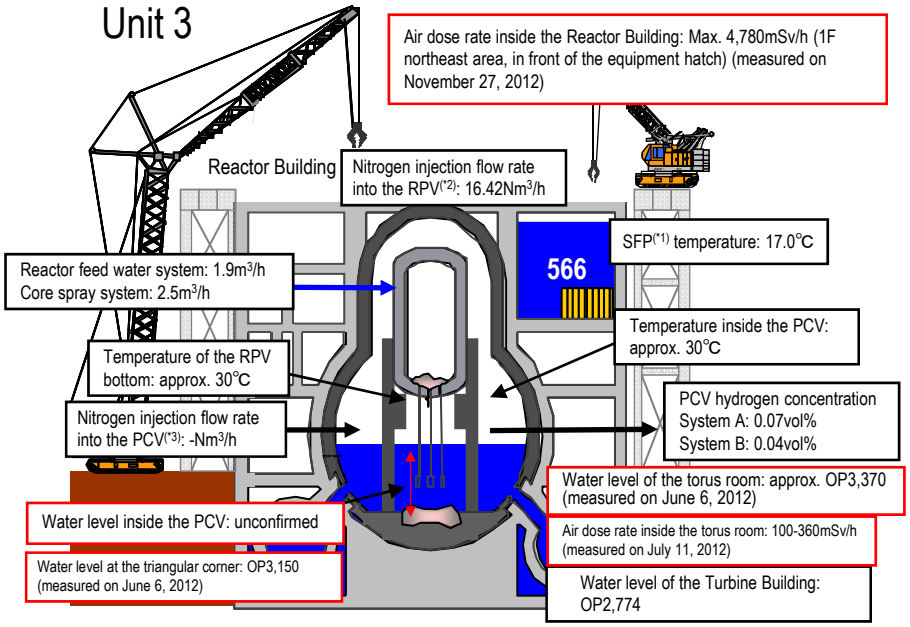
* Main Steam Isolation Valve: A valve to shut off the steam generated from the Reactor in an emergency

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).
- To facilitate decontamination inside the Reactor Building, removal of obstacles on the 1st floor was conducted (from November 18, 2013 to March 20, 2014).

Robot for investigating the contamination status (gamma camera mounted)

Unit 3



* Indices related to plant are values as of 11:00, October 29, 2014

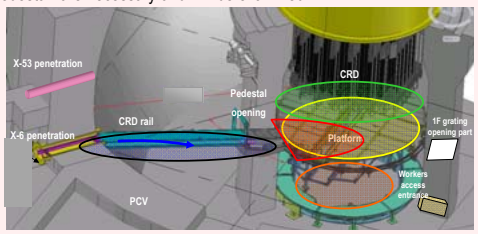
Status of equipment development toward investigating inside the PCV

Prior to removing fuel debris, to check the conditions inside the Primary Containment Vessel (PCV), including the location of the fuel debris, investigation inside the PCV is scheduled. As the water level inside the PCV is high and the penetration scheduled for use in Units 1 and 2 may be under the water, another method needs to be examined.

[Steps for investigation and equipment development]

(1) Investigation from X-53 penetration
- From October 22-24, the status of X-53 penetration, which may be under the water and which is scheduled for use to investigate the inside of the PCV, was investigated using remote-controlled ultrasonic test equipment. Results showed that the penetration is not under the water.
- An investigation of the inside of the PCV is scheduled for around the 1st half of FY2015. Given the high radioactivity around X-53 penetration, the introduction of remote-controlled equipment will be examined based on the decontamination status and shielding.

(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 decline. 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)

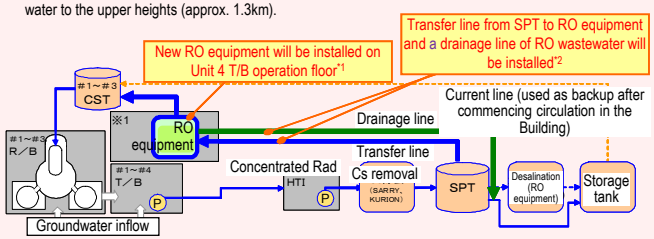
Progress toward decommissioning: Work related to circulation cooling and accumulated water treatment line

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

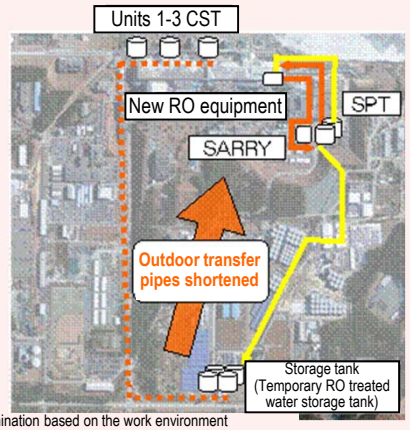
Work to improve the reliability of the circulation water injection cooling system and pipes to transfer accumulated water.

- Operation of the reactor water injection system using Unit 3 CST as a water source commenced (from July 5, 2013). Compared to the previous 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 is approx. 2.1km, including the transfer line of surplus water to the upper heights (approx. 1.3km).



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



Typhoon measures improved for Tank Area

• Enhanced rainwater measures were implemented, including increasing the height of fences to increase the capacity to receive rainwater and installing rain gutters and fence cover to prevent rainwater inflow. Though a total of 300mm of rainfall was recorded by typhoon Nos. 18 and 19, no outflow of contaminated rainwater from inside the fences was detected.

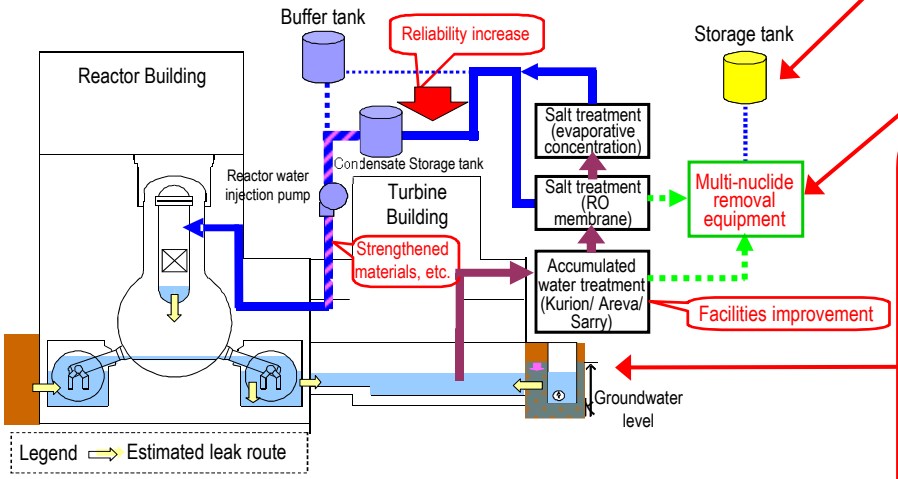
Before installing the fence cover

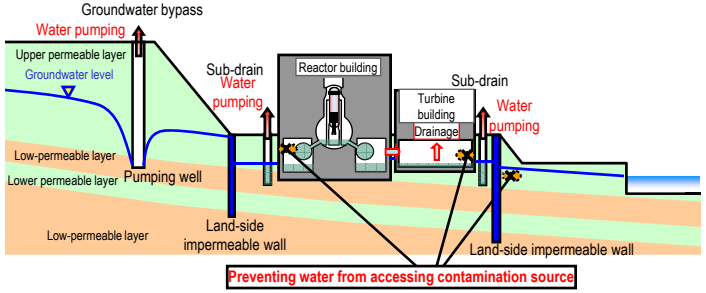
After installing the fence cover

Risk reduction of contaminated water stored in tanks

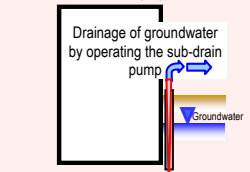
All three multi-nuclide removal equipment (ALPS) systems (existing, additional and high-performance) are operating.

In addition, work to install multiple treatment equipment to reduce strontium density is underway. This equipment is also used to reduce the risks of contaminated water stored in tanks.



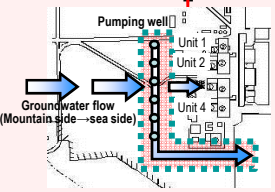


Preventing groundwater from flowing into the Reactor Buildings



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.

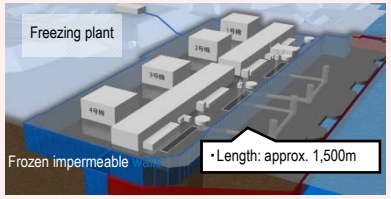
The pumped up groundwater is temporarily stored in tanks and released after TEPCO and a third-party organization have confirmed that its quality meets operational targets.

Through periodical monitoring, pumping of wells and tanks is operated appropriately.

At the observation holes installed at a height equivalent to the buildings, the trend showing a decline in groundwater levels is checked.

The analytical results on groundwater inflow into the buildings based on existing data showed a declining trend.

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



To prevent the inflow of groundwater into the Reactor Buildings, installation of impermeable walls surrounding the buildings on the land side is planned.

Targeting efforts to commence freezing at the end of this fiscal year, drilling holes to install frozen pipes commenced from June 2.

Installing frozen impermeable walls around Units 1-4 to prevent the inflow of groundwater into R/B

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

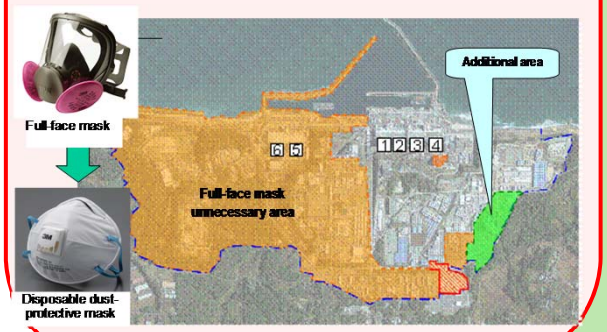
Progress toward decommissioning: Work to improve the environment within the site

Immediate targets	・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 full-face mask unnecessary 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.

In the J tank installation area on the south side of the site, as decontamination was completed, the area will be set as full-face mask unnecessary area (from May 30), where for works not handling contaminated water, wearing disposable dust-protective masks will be deemed sufficient .

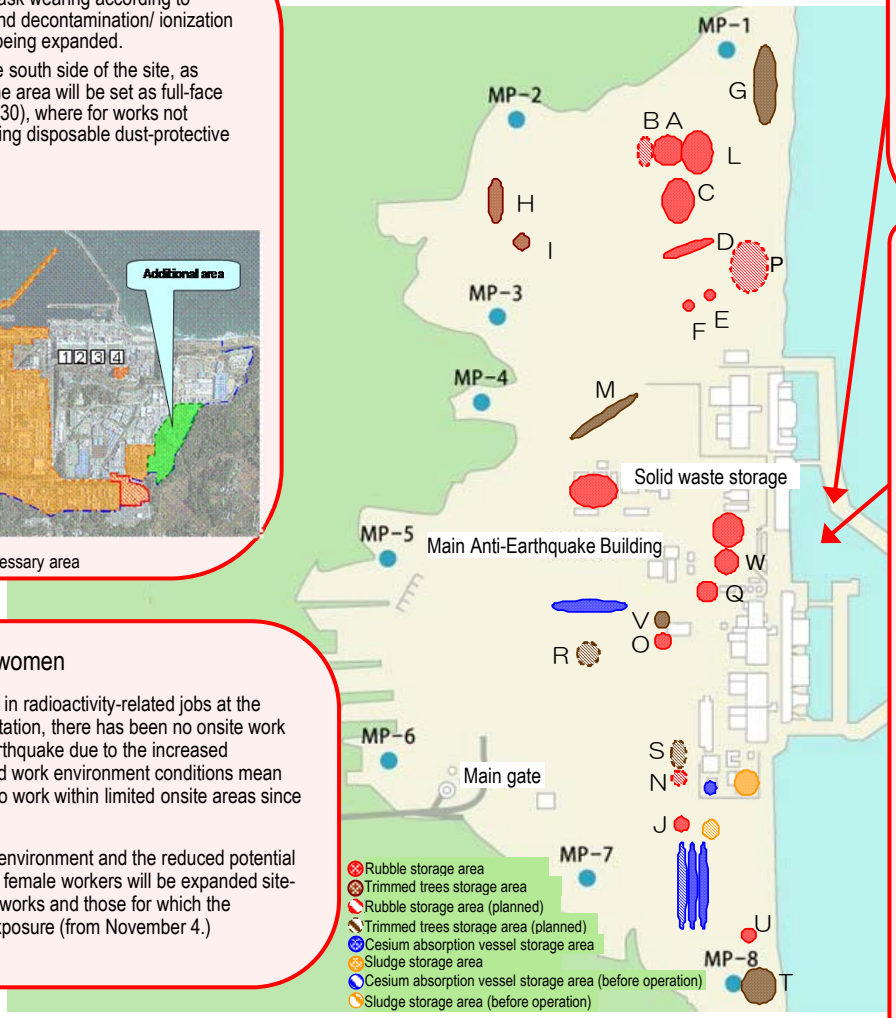


Full-face mask unnecessary area

Expansion of work areas for women

Regarding female workers engaging in radioactivity-related jobs at the Fukushima Daiichi Nuclear Power Station, there has been no onsite work area since the East Japan Great Earthquake due to the increased radioactivity rate. However, improved work environment conditions mean female workers have been allowed to work within limited onsite areas since June 2012.

Based on the improved onsite work environment and the reduced potential for internal exposure, work areas for female workers will be expanded site-wide, excluding specified high-dose works and those for which the radiation dose exceeds 4mSv per exposure (from November 4.)



Installation of impermeable walls on the sea side

To prevent contamination expansion into the sea where contaminated water had leaked 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.

Installation status of impermeable walls on the sea side
(Landfill status on the Unit 1 intake side)

Reducing radioactive materials in seawater within the harbor

- 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 harbor 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) Prevent leakage of contaminated water
- Ground improvement behind the bank to prevent the 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, 2014)
- Pumping groundwater in contaminated areas (from August 9, 2013, scheduled to commence sequentially)

(2) Isolate water from contamination
- Enclosure by ground improvement on the mountain side
  (Between Units 1 and 2: from August 13, 2013 and completed on March 25, 2014;
  between Units 2 and 3: from October 1, 2013 and completed on February 6, 2014;
  between Units 3 and 4: from October 19, 2013 and completed on March 5, 2014)
- To prevent the ingress of rainwater, the ground surface was paved with concrete (commenced on November 25, 2013 and completed on May 2)

(3) Eliminate contamination sources
- Removing contaminated water in branch trenches and closing them (completed on September 19, 2013)
- Treatment and removal of contaminated water in the seawater pipe trench

Unit 2: November 14, 2013 – April 25, 2014, treatment of cesium and strontium.
From October 16, space filling is underway.
Unit 3: November 15, 2013 – July 28, 2014, treatment of cesium.
Drilling of holes to install frozen/ temperature-measurement pipes, and preparation for space filling is underway.