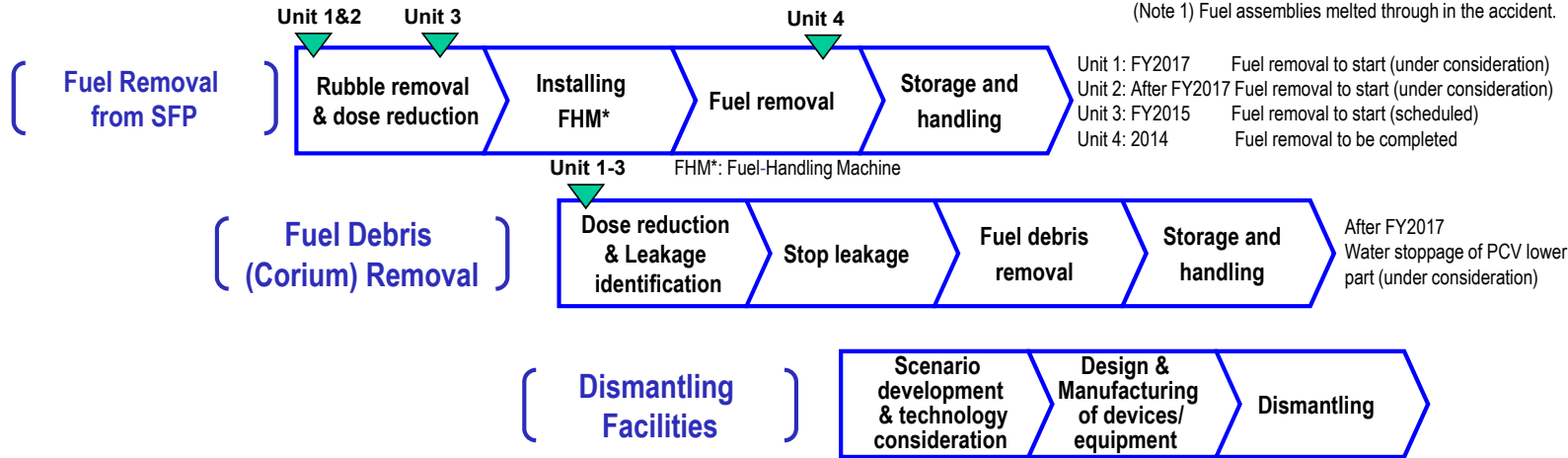


Main works and steps for decommissioning

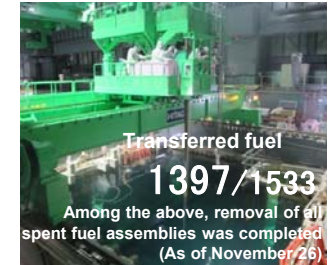
Fuel removal from Unit 4 SFP is underway. Preparatory works to remove fuel from Unit 1-3 SFP and fuel debris (Note 1) removal are ongoing.

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



Fuel removal from SFP

Fuel removal from Unit 4 SFP has been underway since November 18, 2013. Removal of spent fuel assemblies was completed on November 5, 2014. Removal of non-irradiated fuel assemblies will be completed 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

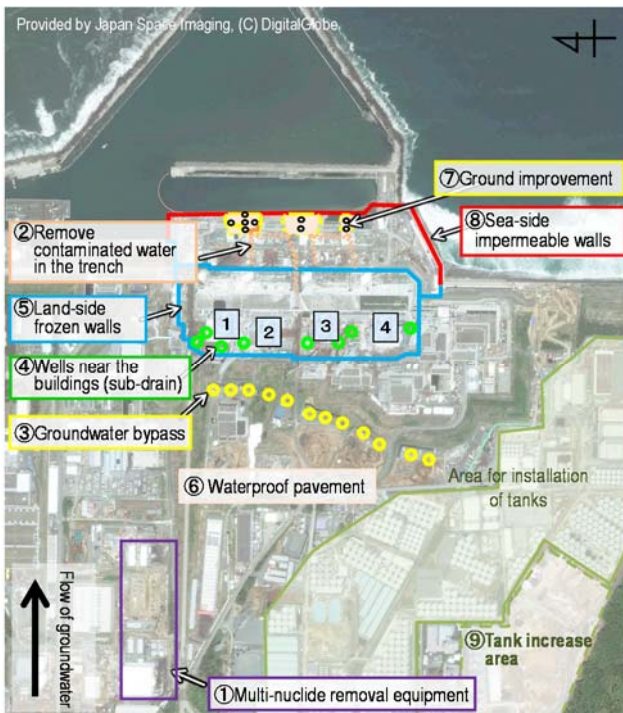
- Multi-nuclide removal equipment
 - Remove contaminated water in the trench (Note 3)
- (Note 3) Underground tunnel containing pipes.

2. Isolate water from contamination

- Pump up ground water for bypassing
- Pump up ground water near buildings
- Land-side frozen walls
- Wells near the buildings (sub-drain)
- Groundwater bypass
- Waterproof pavement

3. Prevent leakage of contaminated water

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



Multi-nuclide removal equipment (ALPS), etc.

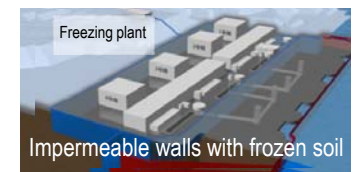
- This equipment removes radionuclides from the contaminated water in tanks, and reduces risks.
- It aims to reduce the levels of 62 nuclides in contaminated water to the legal release limit or lower (tritium cannot be removed).
- Furthermore, contaminated water is treated by installing additional multi-nuclide removal equipment by TEPCO (operation commenced September 2014) and a subsidy project of the Japanese Government (operation commenced 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 commenced in June and the freezing operation is scheduled to 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. 20-45°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).

Investigation into the status of rubble and dust on the Unit 1 R/B top floor

Two roof panels of the Unit 1 Reactor Building (R/B) were removed to facilitate investigation of the rubble status and monitoring of the dust concentration trend on the R/B top floor (operating floor).

No significant variation was detected in the indicated values of dust monitors for the radioactive material density and monitoring posts installed at the site boundaries.

The removed roof panels will be temporarily returned to the roof by early December. Subsequently, after completing the "construction of impermeable walls with frozen soil", which is conducted in the same area, dismantling of R/B cover will commence from around March, 2015.



<Status of building cover roof panels>

Rubble removal inside Unit 3 pool resumed

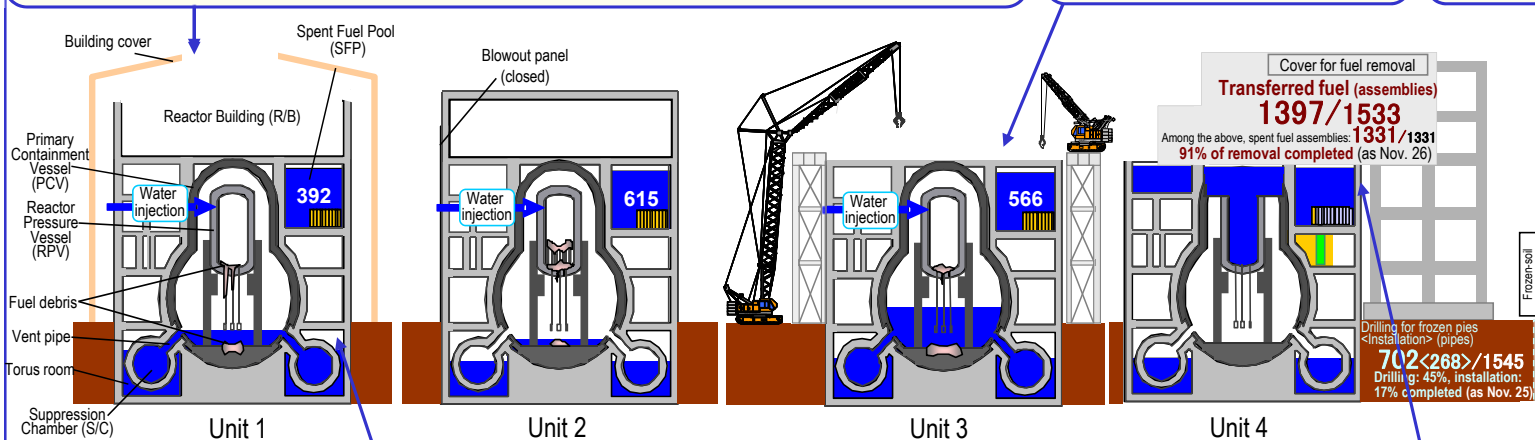
Fuel removal, which was suspended due to the console of the fuel-handling machine falling during work inside the spent fuel pool, will resume from December. As a measure to prevent possible falling, additional cover plates will be installed and large rubble will be removed with dedicated tools.

Questionnaire survey for workers to improve the labor environment

In this survey, approx. 70% of workers (approx. 4,600) answered. The number of "positive" response increased compared with the previous investigation for items such as "transportation to working sites". At the same time, based on requested improvements in the onsite environment and dietary matters, efforts to reform the labor environment will continue.

Construction of additional temporary soil cover-type storage commenced

To store waste appropriately, construction of the 3rd temporary soil cover-type storage for rubble commenced on November 10. Reception of rubble will commence in around March 2015.



Removal of contaminated water from seawater pipe trenches and closure commenced

From November 25, contaminated water is being removed from seawater pipe trenches^(note), which lead from the Turbine Building of Unit 2 on the sea side, and the trenches are being filled with cement-based materials.



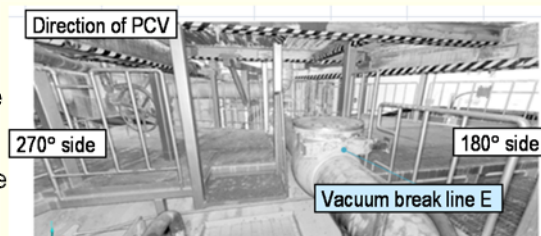
<Near hole for filling>

Note: The term 'trench' means an underground tunnel containing pipes

3D laser scan inside Unit 1 R/B underground floor

The upper part of the underground floor (torus room) of Unit 1 R/B was investigated with a laser scan using a remote-controlled robot, and 3D data was collected.

The collected 3D scan data will subsequently be used when considering a plan to repair the PCV in future.



<Image of 3D data>

Fuel removal from the Unit 4 spent fuel pool completed

Following the removal of rubble from the top floor of Unit 4 R/B and construction of the cover for fuel removal, the fuel has been transferred from the spent fuel pool (SFP) to the common pool since November 18, 2013. On November 5, within a year of the fuel removal commencing, all 1,331 spent fuel assemblies in the pool had been transferred.

The remaining non-irradiated fuel assemblies to the Unit 6 SFP will be transferred within December. When completed, all fuel assemblies will have been removed from Unit 4. Based on this experience, fuel assemblies will be removed from Unit 1-3 pools.



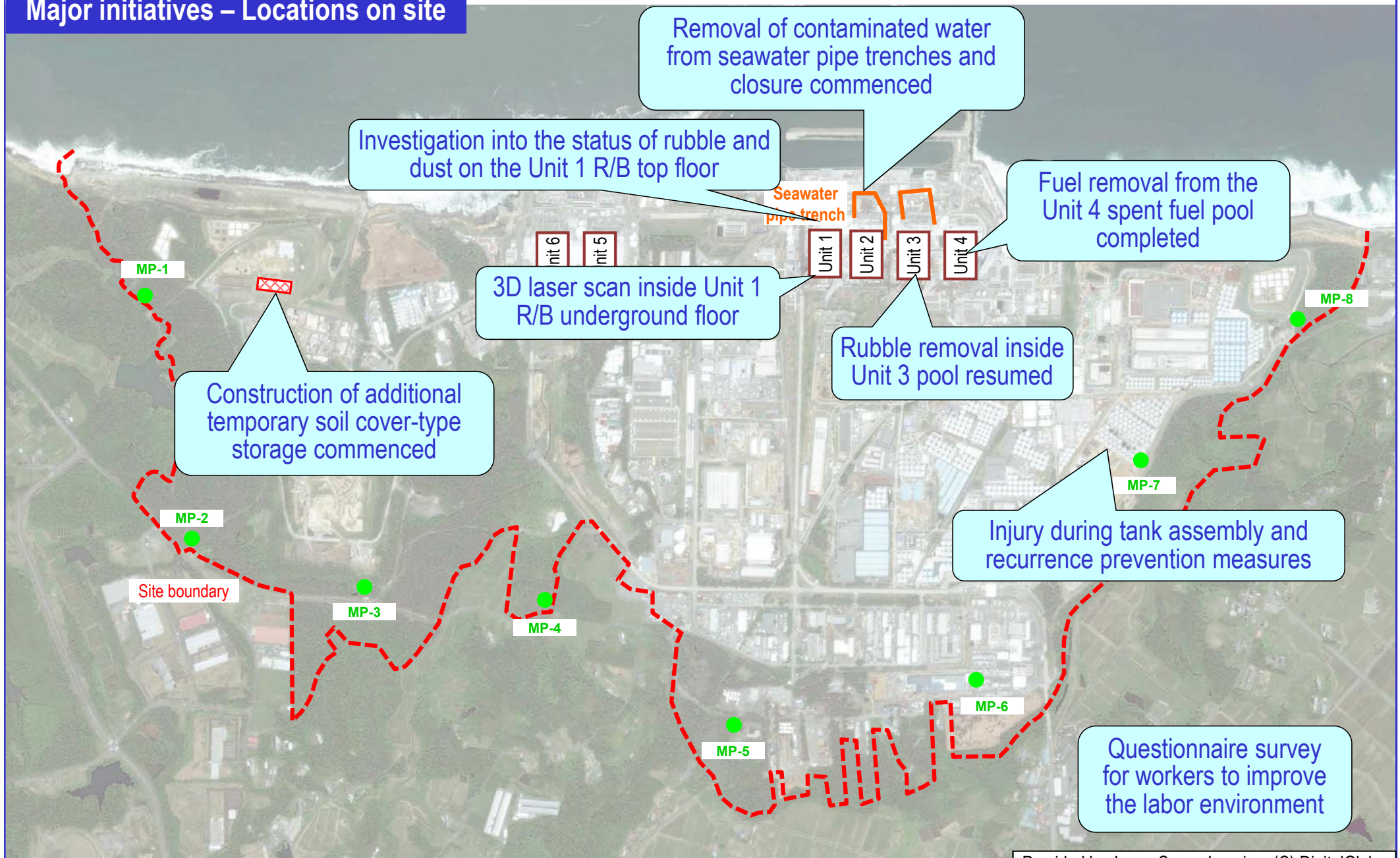
<Storage of spent fuel in common pool>

Injury during tank assembly and recurrence prevention measures

While assembling the tank, tank parts fell from the upper side and injured three workers who were working on a neighboring tank.

The procedures when handling heavy load will be reviewed, measures to prevent tank parts falling will be implemented, while works around tanks will be appropriately managed to ensure safety.

Major initiatives – Locations on site



* Data of Monitoring Posts (MP1-MP8.)

Data of Monitoring Posts (MPs) measuring airborne radiation rate around site boundaries show 1.220 - 4.173 μ Sv/h (October 29-November 25, 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.

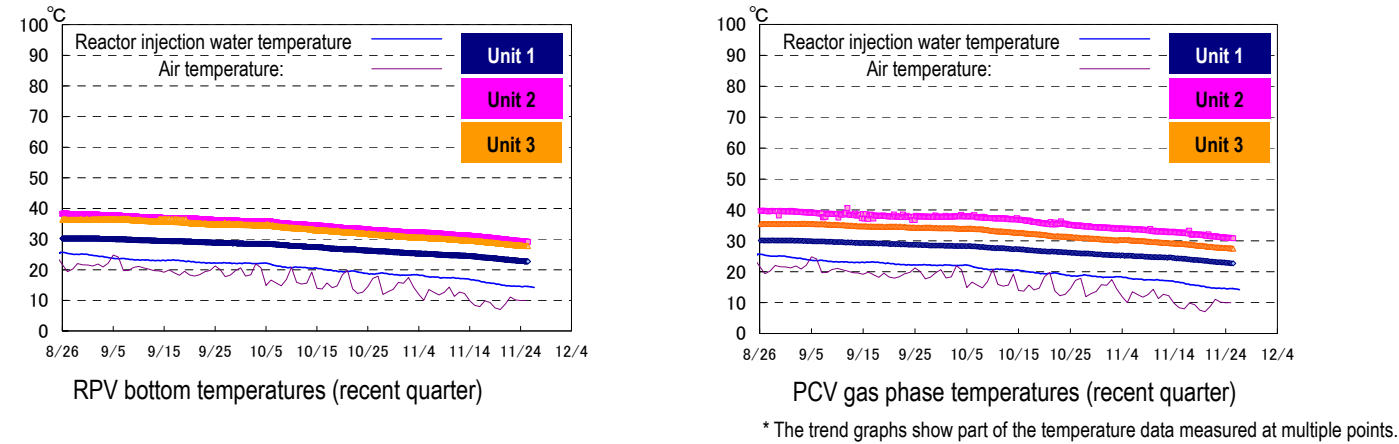
The radiation shielding panel around the monitoring post No. 6, which is one of the instruments used to measure the radiation dose of the power station site boundary, were taken off from July 10 to July 11, since the surrounding radiation dose has largely fallen down due to further cutting down of the forests etc.

Provided by Japan Space Imaging, (C) DigitalGlobe

I. Confirmation of the reactor conditions

1. Temperatures inside the reactors

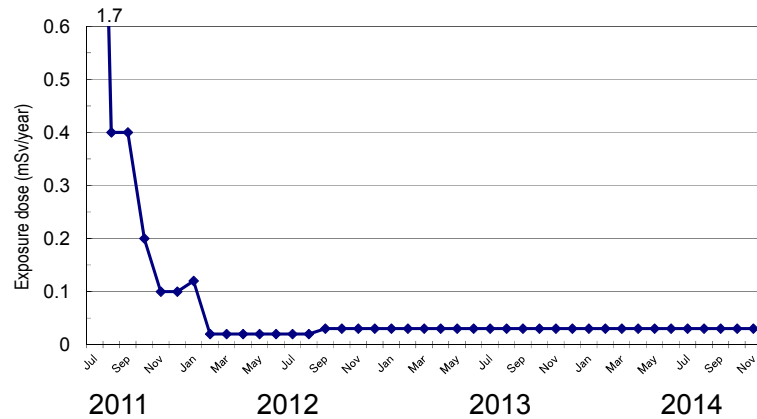
Through continuous reactor cooling by water injection, the temperatures of the Reactor Pressure Vessel (RPV) bottom and the Primary Containment Vessel (PCV) gas phase have been maintained within the range of approx. 20 to 45°C for the past month, though they vary depending on the unit and location of the thermometer.



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. 1.8×10^{-9} Bq/cm³ 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



(Reference)

- The density limit of radioactive materials in the air outside the surrounding monitoring area:
[Cs-134]: 2×10^{-5} Bq/cm³
[Cs-137]: 3×10^{-5} Bq/cm³
- Dust density around the site boundaries of Fukushima Daiichi Nuclear Power Station (actual measured values):
[Cs-134]: ND (Detection limit: approx. 1×10^{-7} Bq/cm³)
[Cs-137]: ND (Detection limit: approx. 2×10^{-7} Bq/cm³)
- Data of Monitoring Posts (MP1-MP8).
Data of Monitoring Posts (MPs) measuring airborne radiation rate around site boundaries showed 1.220 - 4.173 μSv/h (October 29 - November 25, 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 fixation 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 removal to alleviate drawing tension were conducted. At present, the method to be applied to on-site work by installing the mock-up test equipment using full-scale piping is being selected.
- After deciding on the method and training the workers involved, the elimination will be implemented in around January 2015.

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 November 26, 55,908 m³ 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 100 m³/day based on the evaluation data obtained to date 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. 15-20 cm compared to the level before pumping at the groundwater bypass commenced (see Figure 2).
- Regarding the pumping well No. 11, as the flow rate decreased since mid-September, water pumping was stopped on October 15 and the situation was investigated. Groundwater observation results revealed the presence of suspended solids as general bacteria in tunnels. After implementing the necessary measures, the pumping well is scheduled to resume in around early December.

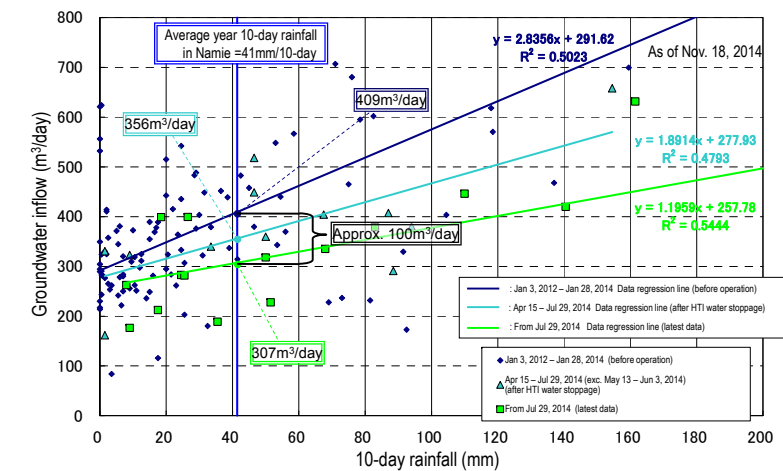


Figure 1: Analytical results of inflow into buildings

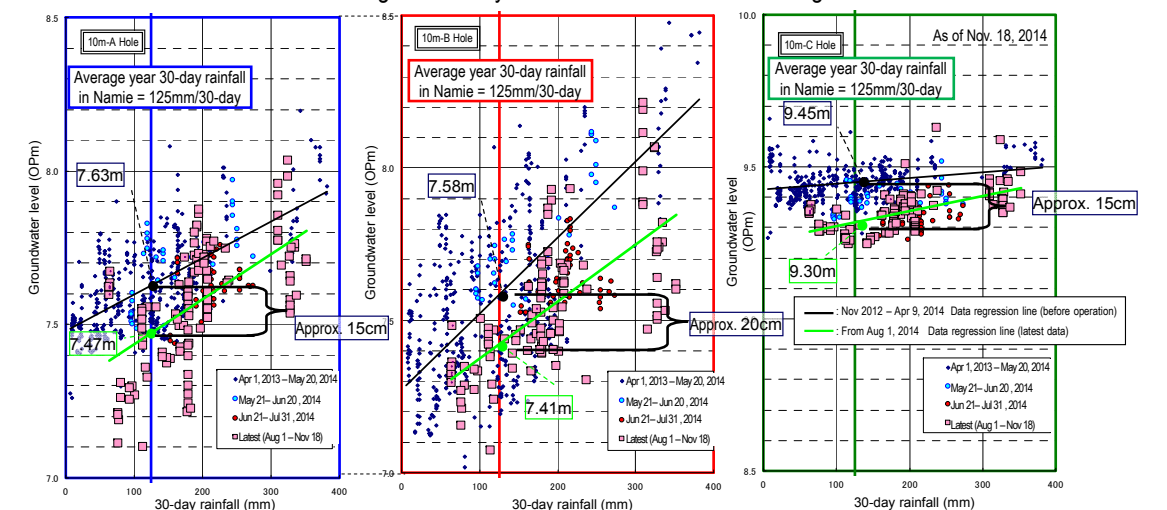


Figure 2: Water levels of groundwater bypass Observation Holes

➤ 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 November 25, drilling at 834 points (for frozen pipes: 702 of 1,545 points, for temperature-measurement pipes: 132 of 317 points) and installation of frozen pipes at 268 of 1,545 points had been completed (see Figure 3).
- Installation of 30 chillers for freezing was completed (from August 26 to November 26).

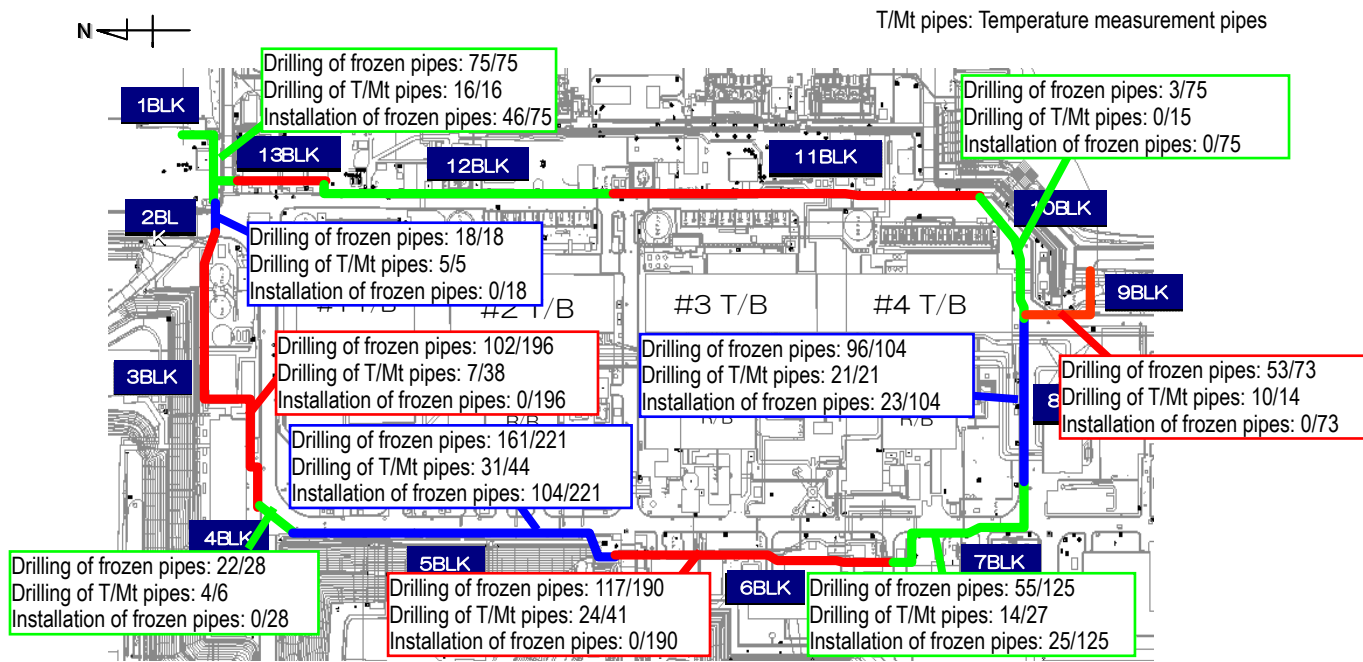


Figure 3: Drilling status for frozen-soil impermeable walls and installation of frozen pipes

➤ Status of the subdrain system

- Regarding the subdrain purification system, groundwater (subdrain water) was pumped up and an amount equivalent to four temporary storage tanks (approximately 4,000m³) was purified by the purification system as a system operation test to confirm stable operation (from September 16 to November 5). Through purification by the system, a decline in the density of radioactive materials to below the operational target and the absence of any other y nuclide were all confirmed.
- Treated groundwater will be released inside the port after confirming compliance with the above operational target. The release will be contingent on the relevant parties reaching agreement.
- Though an increase in the radioactive material density was detected at pit Nos. 18 and 19 (October 22), the density drastically 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 the high radiation dose, via horizontal pipes, the fallout components were gradually drawn into pit Nos. 18 and 19 by pump operation. From November 14-21, pit No. 17 was blocked with crushed stone and mortar (see Figure 4).

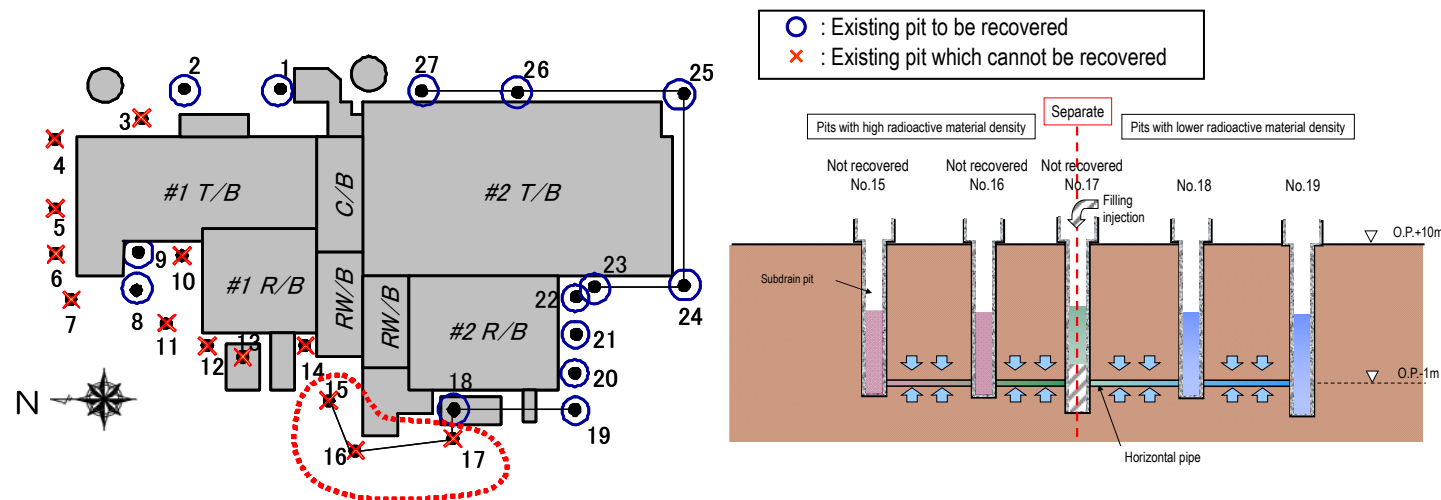


Figure 4: Existing subdrain pits around Units 1 and 2

➤ 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. 171,000, 36,000 and 3,000 m³ at the existing, additional and high-performance multi-nuclide removal equipment respectively have been treated (as of November 25, including approx. 9,500m³ stored in J1(D) tank, which contained water with a high density of radioactive materials at the System B outlet).

➤ Toward risk reduction of the contaminated water stored in tanks

- To purify RO concentrated salt water stored in tanks, mobile strontium-removal equipment commenced operation in the G4 south area (from October 2). The number of mobile strontium-removal units will be increased to purify RO concentrated salt water stored in tanks in the H5 north area (scheduled to commence in mid-January). The second mobile strontium-removal equipment will also be installed to purify RO concentrated salt water in tanks of C and G6 areas (scheduled to commence in late January).
- In addition to multi-nuclide removal equipment (existing, additional and high-performance) and mobile strontium-removal equipment, measures including removal of strontium by cesium absorption apparatus (KURION), secondary cesium absorption apparatus (SARRY), and RO concentrated water treatment equipment are installed to reduce risks of contaminated water via multiple approaches.

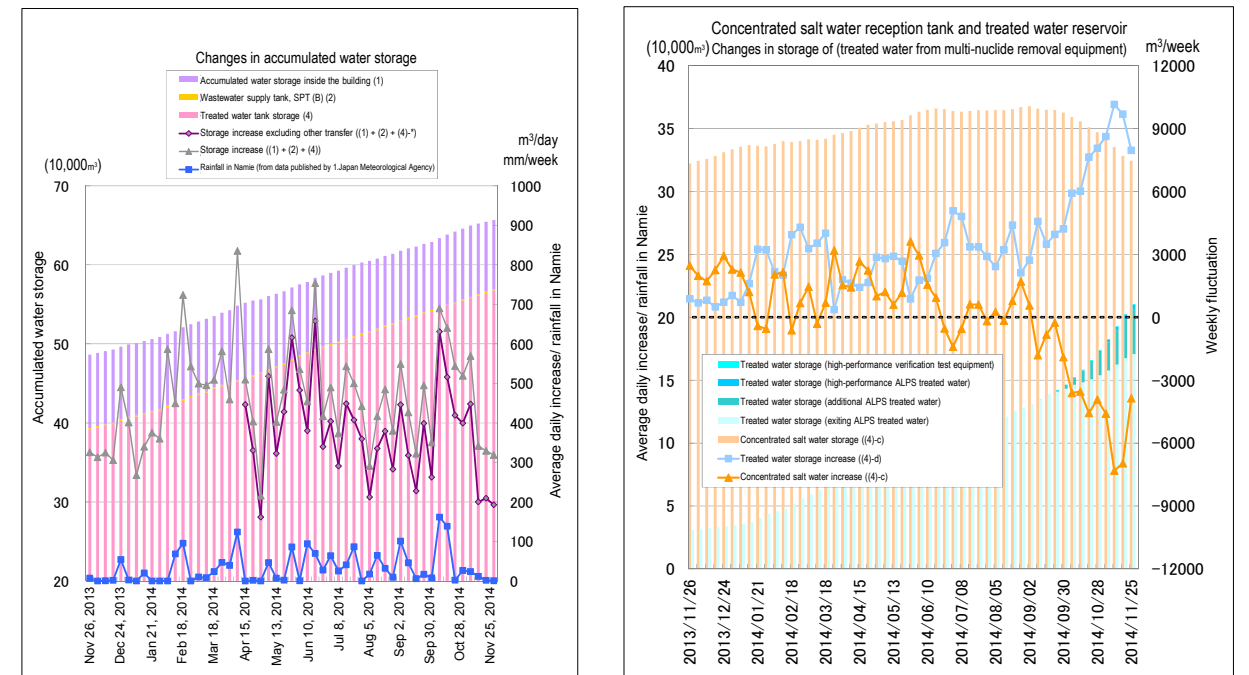


Figure 5: Status of accumulated water storage

➤ Measures in Tank Areas

- 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 November 24, a total of 12,800 m³). On November 3, treatment of rainwater having been stored in underground reservoir No. 4 was completed.
- The destination of the C-release channel was also switched from outside to inside the port since July 14, while the amount released inside the port was gradually increased. As the results of the monitoring within the port identified no significant change, the release of the entire amount was confirmed as of November 21.

➤ Removal of contaminated water from seawater-pipe trenches

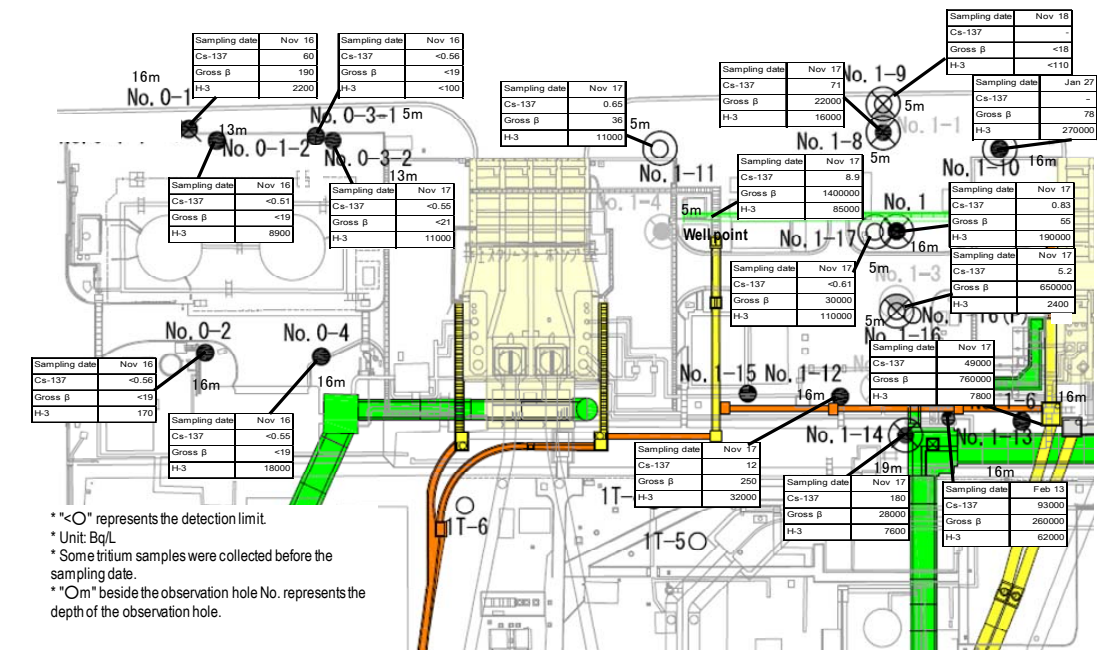
- At the seawater-pipe trench Unit 2 open-cut duct, space filling was conducted at the connection with the buildings (Vertical Shaft A: from October 20 to November 2, open-cut duct: from October 16 to November 6). Work to fill in and close the trench has been underway since November 25.
- At the seawater-pipe 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. From late December, work will commence to remove water and seal them off.

3. Plan to reduce radiation dose and mitigate contamination

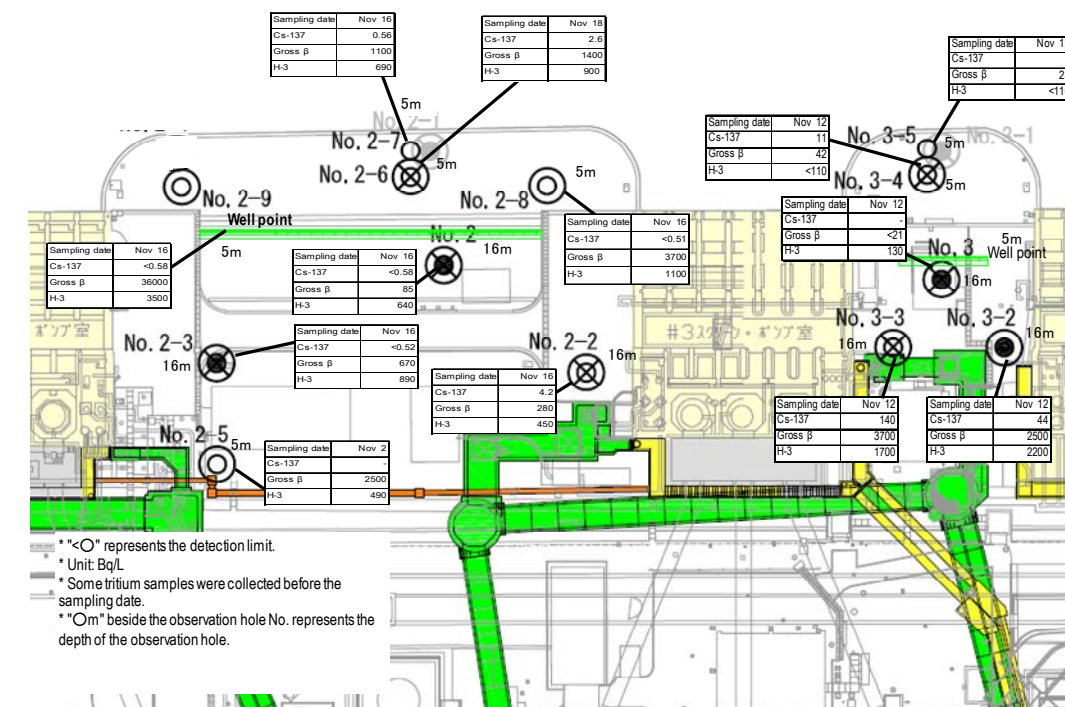
Effective dose-reduction at site boundaries and purification of the port water to mitigate the impact of radiation on the external environment

➤ 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 has been increasing at groundwater Observation Holes Nos. 0-1-2 and 0-4 since July, currently standing at around 9,000 and 18,000 Bq/L, respectively in these locations. Pumping of 1 m³/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 gross β radioactive materials at groundwater Observation Holes Nos.1-6 increased to 7.8 million Bq/L in October, currently decreasing to the level before the increase (around 1 million Bq/L). The density of tritium at groundwater Observation Hole No. 1-14 decreased to 3,000 Bq/L since October, currently standing at the level before the decrease (around 10,000 Bq/L). Though the density of tritium at groundwater Observation Hole No. 1-17, which had been around 10,000 Bq/L, increased to 160,000 Bq/L since October, it is currently standing at around 100,000 Bq/L. The density of gross β, which has been increasing since March, reached 1.2 million Bq/L by October before decreasing to 2,700 Bq/L and is currently standing at around 30,000 Bq/L. Water pumping from the well point (approx. 10 m³/day) and the pumping well No. 1-16 (P) (1m³/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 up to October. These densities have been decreasing since November, currently standing at around 3,000 and 40,000 Bq/L for tritium and gross β radioactive materials respectively. To increase the height of the ground improvement area with mortar, the volume of water pumped from the well point increased to 50 m³/day (from October 31).
- Regarding the radioactive materials in groundwater near the bank between the Unit 3 and 4 intakes, a low density was maintained at all Observation Holes up to October.
- Regarding the 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, a low density equivalent to that at the point to the north of the east breakwater was maintained.
- The density of radioactive materials in seawater within the port has been slowly declining up to October.
- 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. Failures in terms of facility and measurement were identified in the test operation conducted from September 4. After rectifying the failures, checking the operation conditions and collecting and evaluating measurement data, full-scale operation will commence from February 2015.
- The density of cesium 137, in water accumulated in the vertical shaft on the upstream side of the Unit 1 release channel, increased immediately after Typhoon Nos. 18 and 19 and then declined. There was no significant change in the density of cesium 137 in seawater within and outside the port. Additional investigation around the vertical shaft on the upstream side of the Unit 1 release channel could not identify the contamination source. Investigation and measures regarding inflow into the release channel will continue while preparation for the full-scale purification of accumulated water gets underway.
- 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). After the plant modification associated with the change in covering materials was conducted (from October 10 to November 11), covering over Area (2) commenced on November 17 (see Figure 9). As of November 25, 28% of the construction had been completed. The seabed of the intake open channels had been covered by FY2012.
- Regarding the analysis of strontium, which requires advanced professional skills and considerable time (a minimum of approx. 24 days), “β nuclide analysis equipment (Picoβ)” was introduced since September 2013 to reduce the analysis time; targeting improved pre-treatment technology within far less time (a minimum of approx. 2-4 days). To further reduce time, a method to analyze strontium using ICP-MS (a minimum of approx. 30 minutes) was developed by a team including Fukushima University and a demonstration test prior to introduction conducted. The results showed that the method would be applicable for freshwater samples with a detection limit exceeding 1Bq/L. Operation will commence in December 2014.



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



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

Figure 6: Groundwater density on the Turbine Building east side

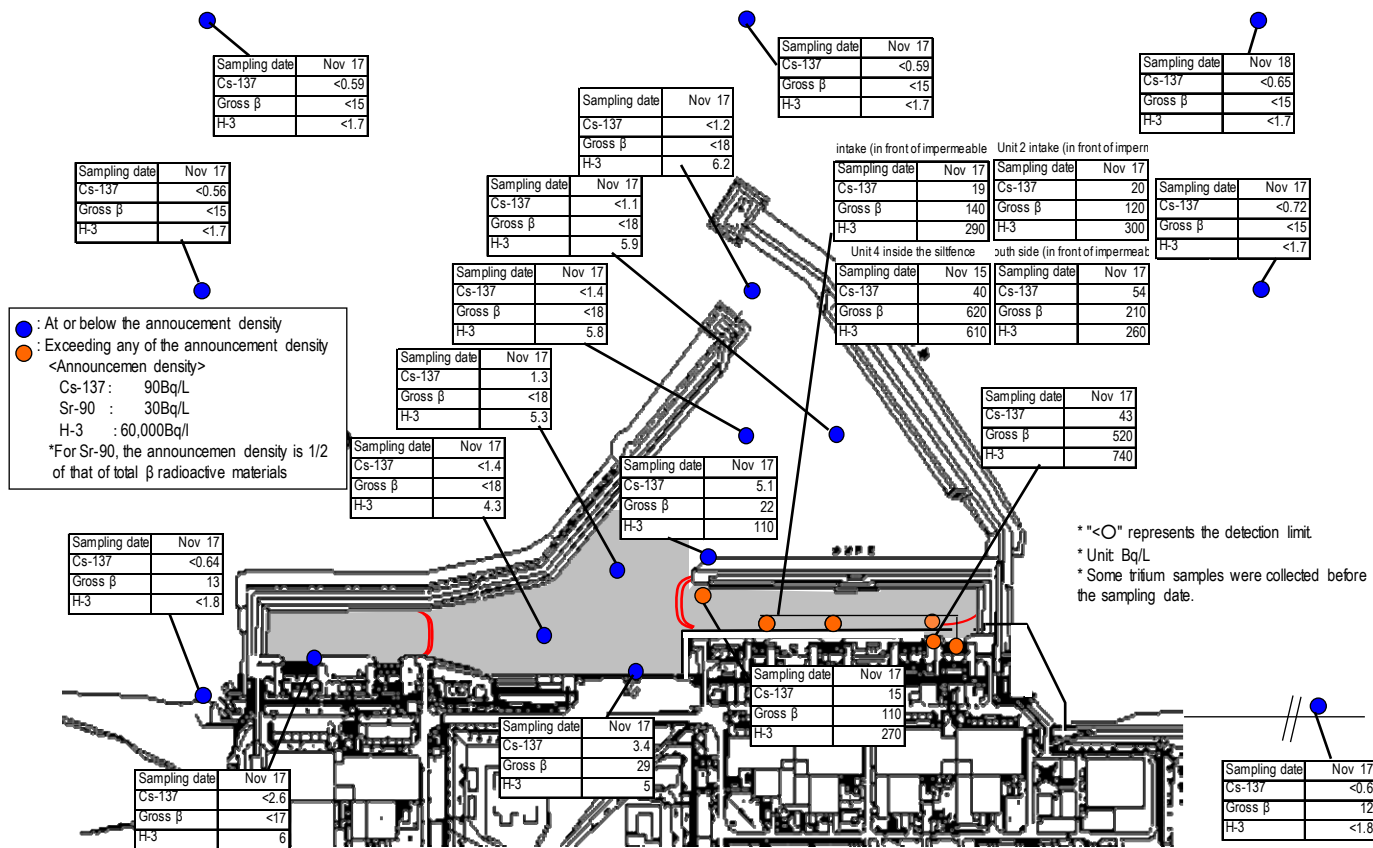


Figure 7: Seawater density around the port

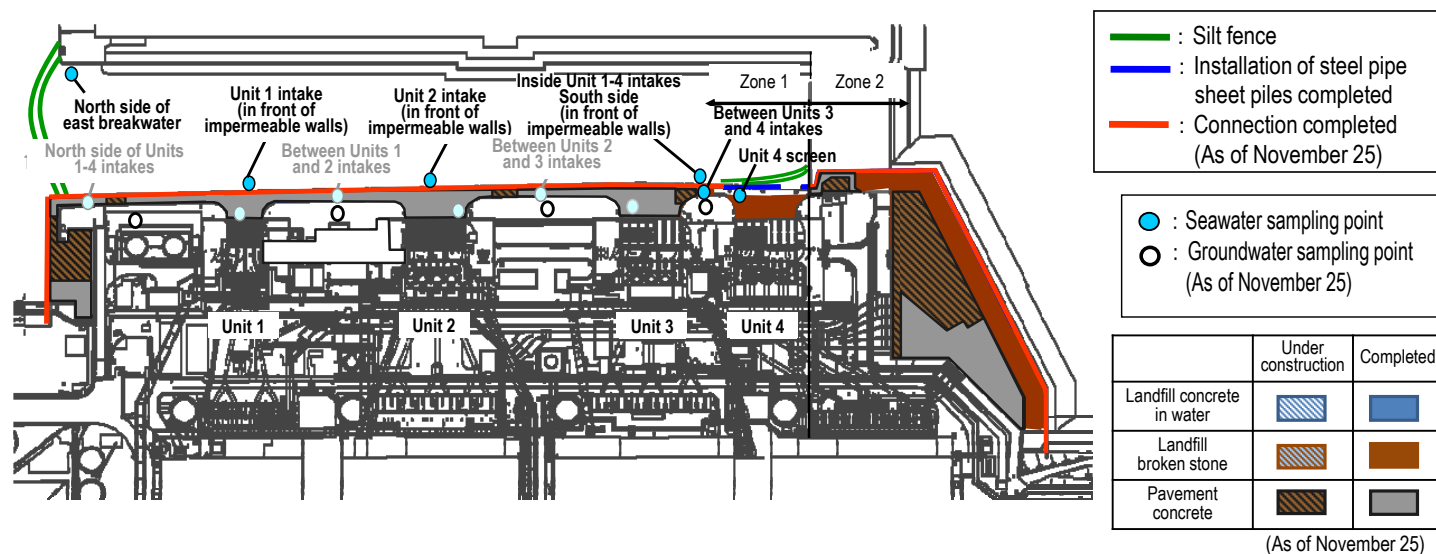


Figure 8: Progress status of impermeable walls on the sea side

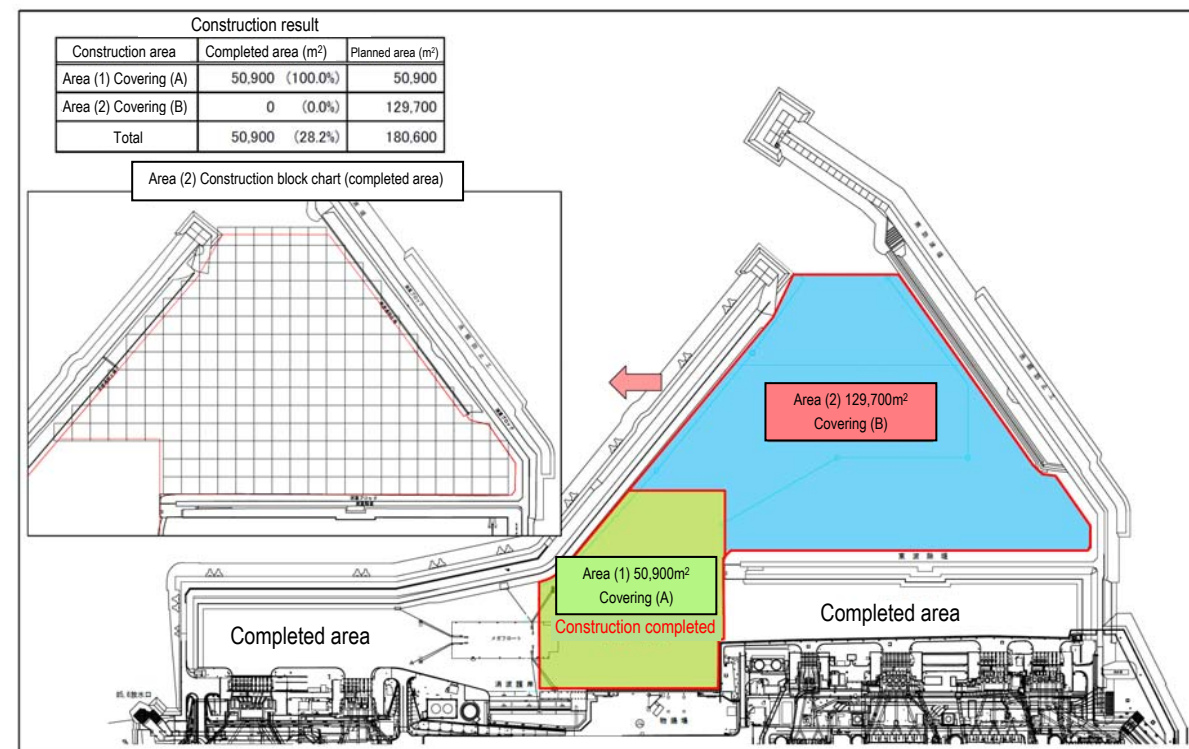


Figure 9: Progress status of the seabed soil covering within the port

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. On November 5, 1,331 spent fuel assemblies in the pool had been transferred to the common pool, significantly reducing risks.
- As of November 26, 1,331 of 1,331 spent fuel assemblies and 66 of 202 non-irradiated fuel assemblies had been transferred to the common pool. Approx. 91% of the fuel removal was completed. Regarding non-irradiated fuel assemblies, transfer to the Unit 6 spent fuel pool will be completed by December.
- To evaluate long-term soundness of fuel assemblies removed from the spent fuel pool, a visual inspection on fuel assemblies transferred from the Unit 4 spent fuel pool to the common pool was conducted (November 18-25).

➤ Main work to help remove spent fuel at Unit 3

- During rubble removal inside the spent fuel pool, the console and the overhanging pedestal of the fuel-handling machine, which were scheduled for removal, fell (August 29). The operation, which has been suspended due to this incident, will resume from December. To prevent possible fall, additional cover plates will be installed.
- Measures to reduce radiation dose (decontamination and shielding) on the 5th floor of the Reactor Building (operating floor) has been implemented since October 15, 2013. As the expected effects of decontamination in the initial plan have yet to be achieved, installation of additional shields and additional decontamination are scheduled at the collapsed northwest area.

➤ Main work to help remove spent fuel at Unit 1

- To help the work on dismantling the building cover, scheduled to commence at the end of FY2014, progress 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.
- Two roof panels were removed (the 1st, on October 31 and the 2nd, on November 10). Investigation on the status of rubble on the operating floor and monitoring of the dust concentration trend are underway. The removed roof panels will be temporarily returned to the roof by early December.
- On November 12, oil bleeding was detected with the 750t-crawler crane, which is used for cover dismantling. After replacing and inspecting pipes with which bleeding was identified, the work resumed from November 18.

5. Fuel debris removal plan

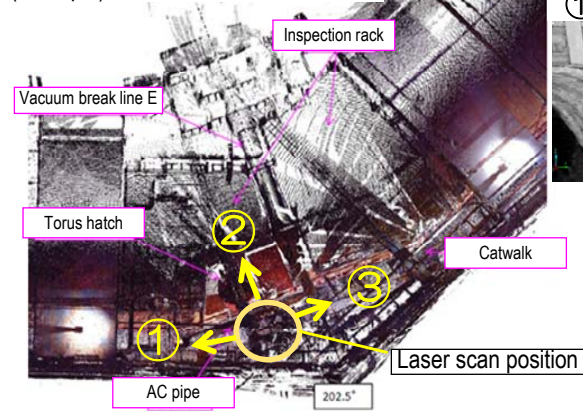
In addition to decontamination and shield installation to improve PCV accessibility, technology was developed and data gathered as required to prepare to remove fuel debris (such as investigating and repairing PCV leak locations)

➤ 3D laser scan inside the Unit 1 torus room

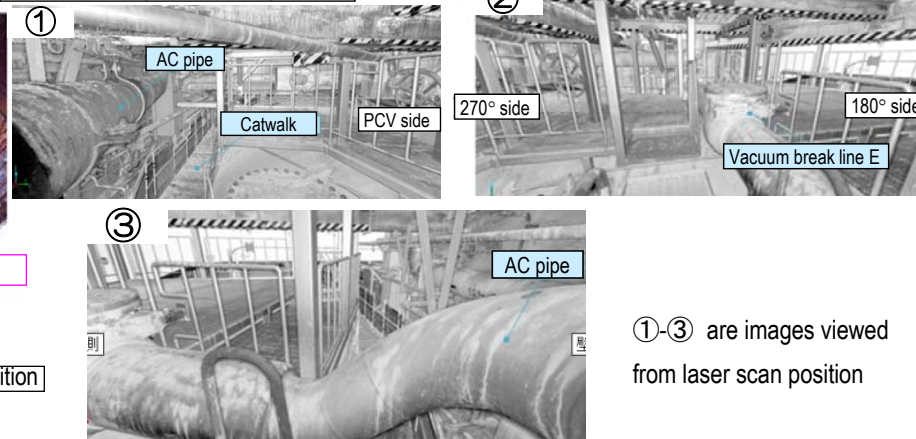
- For use in evaluating obstacles as required for works, including water stoppage at the PCV, inside the Unit 1 Reactor Building torus room, which will be conducted as a future step, 3D data inside the torus room was collected using remote-controlled equipment and with mounted 3D laser-measurement equipment (from October 31 to November 7). The collected 3D scan data will be used in the plan to repair the PCV and vacuum break line.

Torus room laser scan points data

(Example) Around vacuum break line E



Points data processed photos



①-③ are images viewed from laser scan position

Figure 10: Results of laser scan inside torus room

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

➤ Construction of additional temporary soil cover-type storage commenced

- To store waste appropriately, construction of the 3rd temporary soil cover-type storage for rubble commenced on November 10. Reception of rubble will commence in around March 2015.



Figure 11: Temporary soil cover-type storage – Drilling status of 3rd installation area

➤ Management status of rubble and trimmed trees

- As of the end of October, the total storage volume of concrete and metal rubble was approx. 123,300 m³ (+8,100 m³ compared to at the end of September, area-occupation rate: 69%). The total storage volume of trimmed trees was approx. 79,600 m³ (-100 m³ compared to at the end of September, area-occupation rate: 58%). The increase in rubble was mainly attributable to the construction to install tanks and impermeable walls with frozen soil. The decrease in trimmed trees was mainly attributable to arranging stored items.

➤ Management status of the secondary waste from water treatment

- As of November 25, the total storage volume of waste sludge was 597 m³ (area-occupation rate: 85%). The total number of stored spent vessels and high-integrity containers (HIC) of multi-nuclide removal equipment was 1,284 (area-occupation rate: 50%).
- Regarding the storage of cesium absorption vessels (3rd storage) to store HICs generated from the multi-nuclide removal equipment, the implementation plan was approved on November 20.

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 July to September was approx. 13,500 (TEPCO and partner company workers), which exceeded the monthly average number of actual workers (approx. 10,400). 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 December (approx. 6,280 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 12).

* Some works for which contract procedures have yet to be completed are excluded from the December 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 October was approx. 45%.

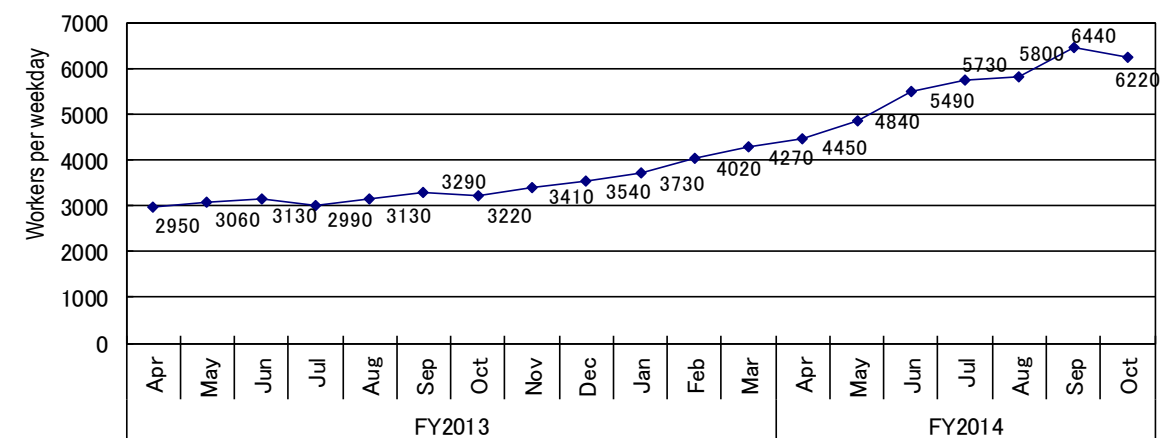


Figure 12: Changes in the average number of workers per weekday for each month since FY2013 (actual values)

- The average exposure dose of workers remained at approx. 1mSv/month in both FY2013 and FY2014. (Reference: annual average exposure dose 20mSv/year \div 12 = 1.7mSv/month)
- For most workers, the exposure dose was sufficiently within the limit and at a level which allowed them to continue engaging in radiation work.

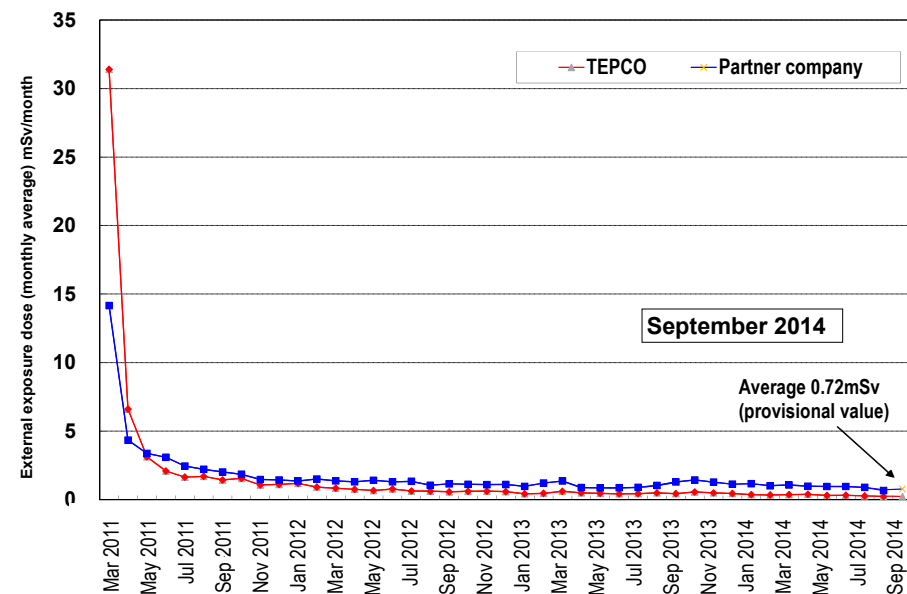


Figure 13: Changes in monthly individual worker exposure dose (monthly average exposure dose since March 2011)

➤ Initiatives to improve the labor environment

- A questionnaire survey for workers regarding the overall labor environment was conducted (August 2014), to which 4,587 workers responded (collection rate: 69.8%). Regarding the current labor environment, the number of “positive” responses increased for all items compared with the previous investigation. At the same time, regarding the on-site environment and dietary matters, many respondents requested an improvement as in the previous survey. In particular, in response to the requested improvement in the dietary environment, a meal service center will be built in Ohkuma Town and a dining area set up in the large rest house (9 stories above ground with a capacity of approx. 1,200 workers) to supply meals (April 2015).

➤ Preventing infection and expansion of influenza and norovirus

- Since October, measures for influenza and norovirus have been implemented. As part of these efforts, free influenza vaccination (subsidized by TEPCO) is being provided at the new Administration Office Building in the Fukushima Daiichi Nuclear Power Station (from October 29 to December 5) and medical clinics around the site (from November 4 to January 30, 2015) for workers of partner companies. As of November 21, a total of 5,036 workers had been vaccinated. In addition, a comprehensive range of other measures is also being implemented, including daily actions to prevent infection and expansion (measuring body temperature, health check and monitoring infection status) and response after detecting possible infection (control of swift entry/exit and mandatory wearing of masks in working spaces).

8. Others

➤ Incident involving fall of step rails for the turntable ladder in the J2 tank area

- When moving a rail for the turntable ladder (half-around), which was temporarily fixed to the upper part of the A-4 tank in the J2 area to adjust its position relative to another rail (which had been temporarily welded), the rail for the turntable ladder fell. It then bounced off the ground and touched three workers who were installing temporary connections for the neighboring A-3 tank.
- To prevent recurrence, procedures when lifting heavy loads will be clarified and hard measures, such as installing welded metal materials to prevent rail falls in advance, will be implemented while coordination with work performed by other companies when handling heavy materials shall be managed appropriately.

➤ Progress status of the “Emergency Safety Measures for Fukushima Daiichi Nuclear Power Station”

- Regarding the “Emergency Safety Measures for Fukushima Daiichi Nuclear Power Station” formulated in November 2013 to accelerate decommissioning and measures for issues related to contaminated water and tanks and to improve reliability, the following progress has been made (see Figure 14):
 - ✓ Removing damaged vehicles on the east side of the Turbine Building (the last vehicle was removed on September 19)
 - ✓ Constructing a new Administration Office Building (full-scale operation commenced on October 27)
 - ✓ Building a large rest house (construction commenced on January 27, installation of external walls and other related works is underway)

- ✓ Building a meal service center (the groundbreaking ceremony was conducted on May 29; steel-frame and other works are underway)
- ✓ Enhancing the management and framework for safety and quality assurance
- ✓ Measures for rainwater (fence height was increased and rain gutters installed in existing tank areas)
- ✓ Water stoppage by caulking at the bottom of flange tanks (completed in existing tank areas)
- ✓ Replacement with welded-joint tanks (completed in D area)



Building a large rest house



Building a meal service center



Before removing square tanks



After removing square tanks



After installing welded-joint tanks

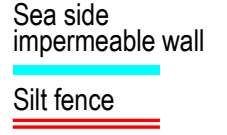
Replacement of D area tanks

Figure 14: Progress status of Emergency Safety Measures

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 November 17-25)"; 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.co.jp/nu/fukushima-np/f1/smp/index-j.html>



Cesium-134: 3.3 (2013/10/17) → ND(1.1) Below 1/3
Cesium-137: 9.0 (2013/10/17) → 1.6 Below 1/5
Gross β: **74** (2013/ 8/19) → ND(17) Below 1/4
Tritium: 67 (2013/ 8/19) → 5.8 Below 1/10

Cesium-134: 4.4 (2013/12/24) → ND(1.3) Below 1/3
Cesium-137: 10 (2013/12/24) → 1.6 Below 1/6
Gross β: **60** (2013/ 7/ 4) → ND(17) Below 1/3
Tritium: 59 (2013/ 8/19) → 5.2 Below 1/10

Cesium-134: 5.0 (2013/12/2) → ND(1.2) Below 1/4
Cesium-137: 8.4 (2013/12/2) → 2.6 Below 1/3
Gross β: **69** (2013/8/19) → ND(17) Below 1/4
Tritium: 52 (2013/8/19) → 5.7 Below 1/9

Cesium-134: 2.8 (2013/12/2) → ND(3.1) Below 1/2
Cesium-137: 5.8 (2013/12/2) → ND(2.5) Below 1/2
Gross β: **46** (2013/8/19) → ND(18) Below 1/2
Tritium: 24 (2013/8/19) → 6.9 Below 1/3

Cesium-134: ND(2.1)
Cesium-137: 5.1
Gross β: **22** (Observation started on October 7)
Tritium: 110

Cesium-134: 3.3 (2013/12/24) → ND(1.2) Below 1/2
Cesium-137: 7.3 (2013/10/11) → ND(1.2) Below 1/5
Gross β: **69** (2013/ 8/19) → ND(17) Below 1/4
Tritium: 68 (2013/ 8/19) → ND(1.5) Below 1/40

Cesium-134: 3.5 (2013/10/17) → ND(1.9) Below 6/10
Cesium-137: 7.8 (2013/10/17) → 2.1 Below 1/3
Gross β: **79** (2013/ 8/19) → ND(17) Below 1/4
Tritium: 60 (2013/ 8/19) → 5.3 Below 1/10

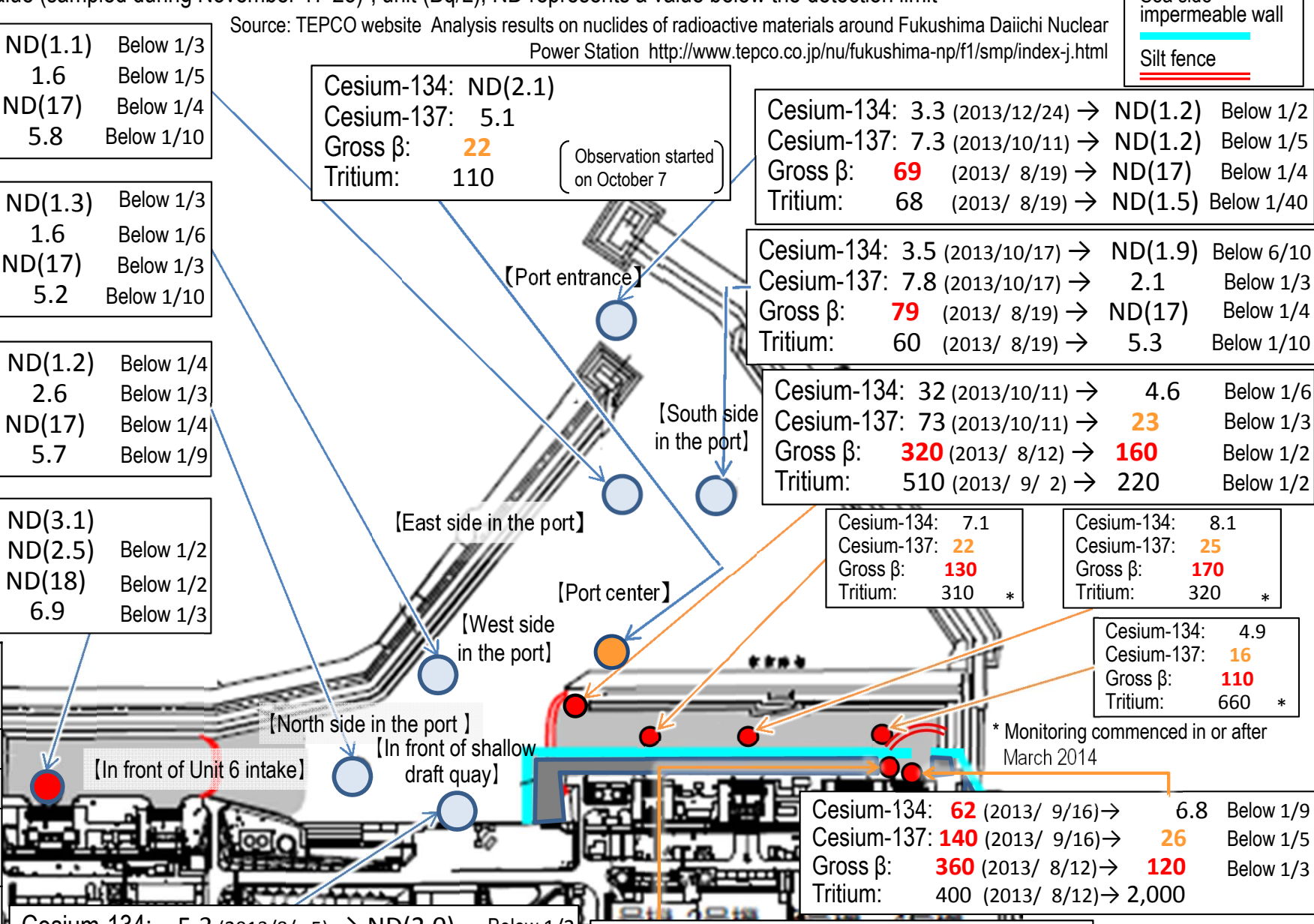
Cesium-134: 32 (2013/10/11) → 4.6 Below 1/6
Cesium-137: 73 (2013/10/11) → **23** Below 1/3
Gross β: **320** (2013/ 8/12) → **160** Below 1/2
Tritium: 510 (2013/ 9/ 2) → 220 Below 1/2

Cesium-134: 7.1
Cesium-137: **22**
Gross β: **130**
Tritium: 310 *

Cesium-134: 8.1
Cesium-137: **25**
Gross β: **170**
Tritium: 320 *

Cesium-134: 4.9
Cesium-137: **16**
Gross β: **110**
Tritium: 660 *

	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



* Monitoring commenced in or after March 2014

Cesium-134: 5.3 (2013/8/ 5) → ND(2.0) Below 1/2
Cesium-137: 8.6 (2013/8/ 5) → 3.7 Below 1/2
Gross β: **40** (2013/7/ 3) → ND(18) Below 1/2
Tritium: 340 (2013/6/26) → 5.6 Below 1/60

Cesium-134: **28** (2013/ 9/16) → 6.8 Below 1/4
Cesium-137: **53** (2013/12/16) → **25** Below 1/2
Gross β: **390** (2013/ 8/12) → **120** Below 1/3
Tritium: 650 (2013/ 8/12) → 2,200

Cesium-134: **62** (2013/ 9/16) → 6.8 Below 1/9
Cesium-137: **140** (2013/ 9/16) → **26** Below 1/5
Gross β: **360** (2013/ 8/12) → **120** Below 1/3
Tritium: 400 (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 November 17-25)

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	6 0	1 0
Cesium-137	9 0	1 0
Strontium-90 (strongly correlate with Gross β)	3 0	1 0
Tritium	6 0 , 0 0 0	10,000

○ [Northeast side of port entrance(offshore 1km)]

○ [East side of port entrance (offshore 1km)]

Cesium-134: ND (2013) → ND (0.67)
Cesium-137: ND (2013) → ND (0.59)
Gross β: ND (2013) → ND (15)
Tritium: ND (2013) → ND (1.8)

Cesium-134: ND (2013) → ND (0.47)
Cesium-137: 1.6 (2013/10/18) → ND (0.59) Below 1/2
Gross β: ND (2013) → ND (15)
Tritium: 6.4 (2013/10/18) → ND (1.8) Below 1/5

○ [Southeast side of port entrance(offshore 1km)]

Cesium-134: ND (2013) → ND (0.74)
Cesium-137: ND (2013) → ND (0.65)
Gross β: ND (2013) → ND (15)
Tritium: ND (2013) → ND (1.8)

Cesium-134: ND (2013) → ND (0.73)
Cesium-137: ND (2013) → ND (0.56)
Gross β: ND (2013) → ND (15)
Tritium: 4.7 (2013/ 8/18) → ND (1.8) Below 1/2

○ [South side of south breakwater(offshore 0.5km)]

Cesium-134: ND (2013) → ND (0.73)
Cesium-137: ND (2013) → ND (0.72)
Gross β: ND (2013) → ND (15)
Tritium: ND (2013) → ND (1.8)

○ [North side of north breakwater(offshore 0.5km)]

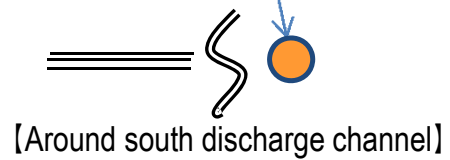
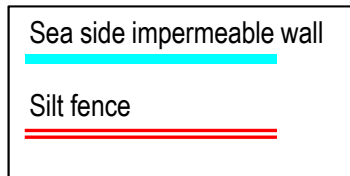
○ [Port entrance]

Cesium-134: 3.3 (2013/12/24) → ND (1.2) Below 1/2
Cesium-137: 7.3 (2013/10/11) → ND (1.2) Below 1/5
Gross β: 69 (2013/ 8/19) → ND (17) Below 1/4
Tritium: 68 (2013/ 8/19) → ND (1.5) Below 1/40

Cesium-134: ND (2013) → ND (0.85)
Cesium-137: 3.0 (2013/ 7/15) → ND (0.72) Below 1/4
Gross β: 15 (2013/12/23) → 13
Tritium: 1.9 (2013/11/25) → 4.2

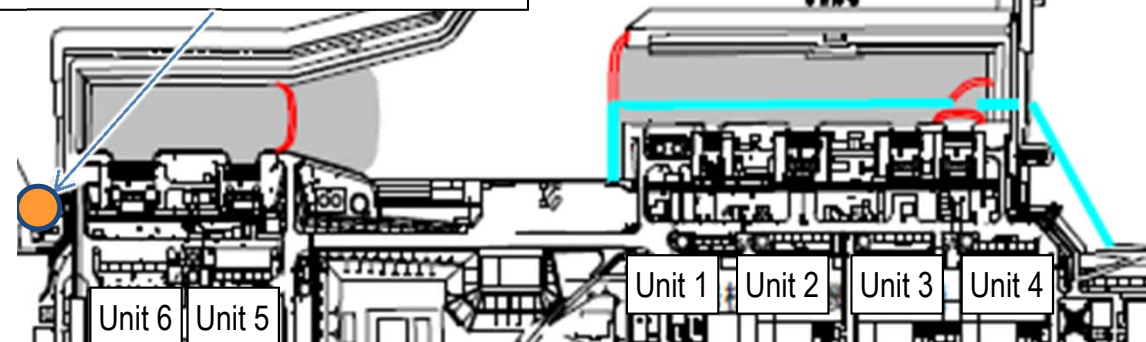
[North side of Units 5 and 6 discharge channel]

Cesium-134: 1.8 (2013/ 6/21) → ND (0.71) Below 1/2
Cesium-137: 4.5 (2013/ 3/17) → ND (0.76) Below 1/5
Gross β: 12 (2013/12/23) → 14
Tritium: 8.6 (2013/ 6/26) → 3.5 Below 1/2



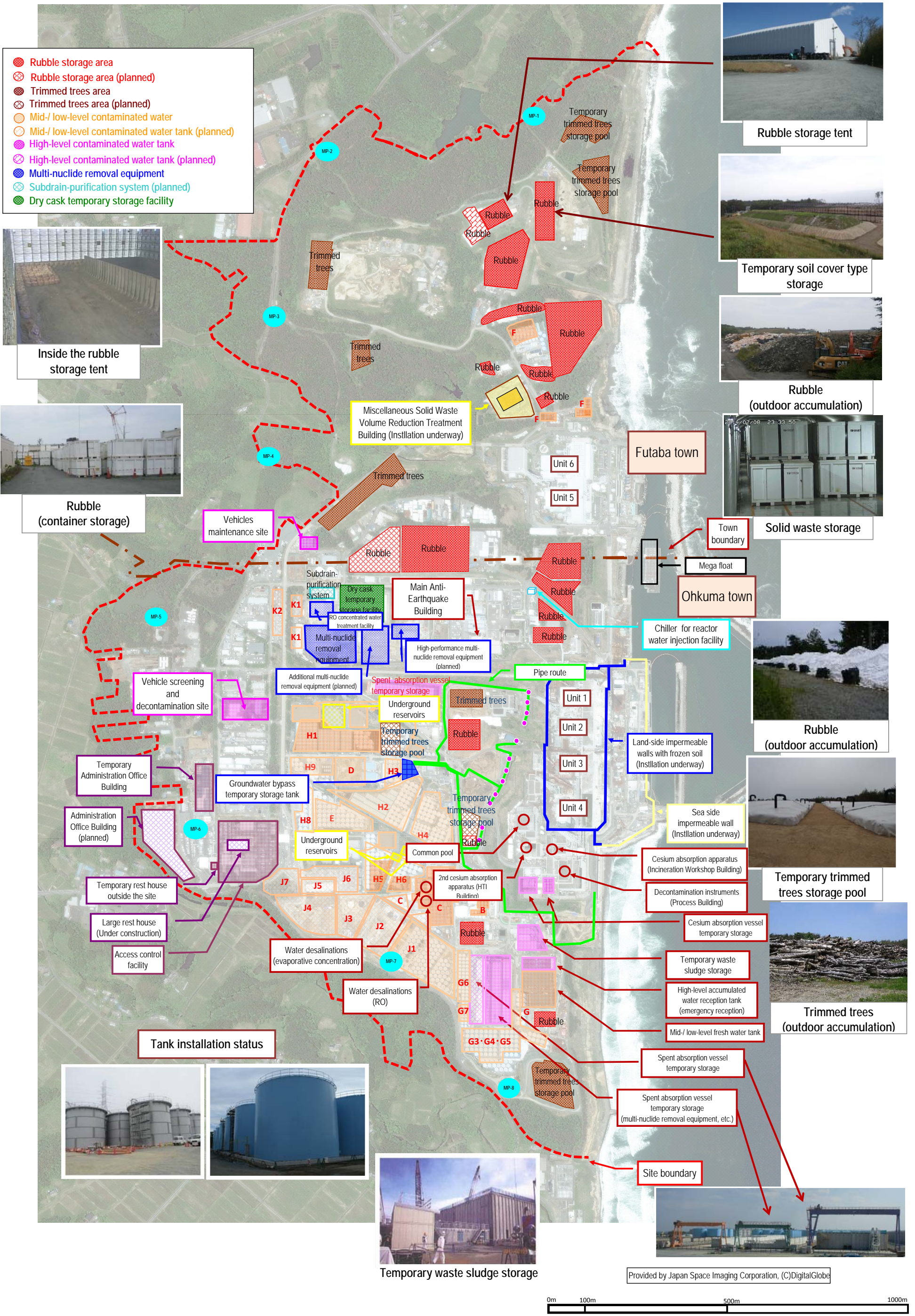
Note: The gross β measurement values include natural potassium 40 (approx. 12 Bq/L).

Summary of TEPCO data as of November 26



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>

TEPCO Fukushima Daiichi Nuclear Power Station Site Layout



- Rubble storage area
- ▨ Rubble storage area (planned)
- Trimmed trees area
- ▨ Trimmed trees area (planned)
- Mid-/ low-level contaminated water
- Mid-/ low-level contaminated water tank (planned)
- High-level contaminated water tank
- High-level contaminated water tank (planned)
- Multi-nuclide removal equipment
- Subdrain-purification system (planned)
- Dry cask temporary storage facility



Inside the rubble storage tent



Rubble (container storage)



Rubble storage tent



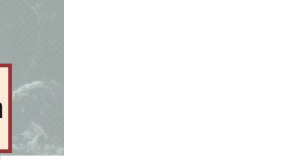
Temporary soil cover type storage



Rubble (outdoor accumulation)



Solid waste storage



Rubble (outdoor accumulation)



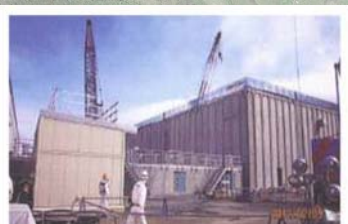
Temporary trimmed trees storage pool



Trimmed trees (outdoor accumulation)

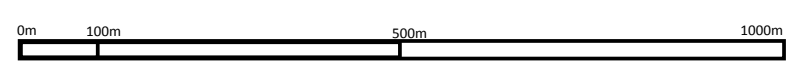


Tank installation status



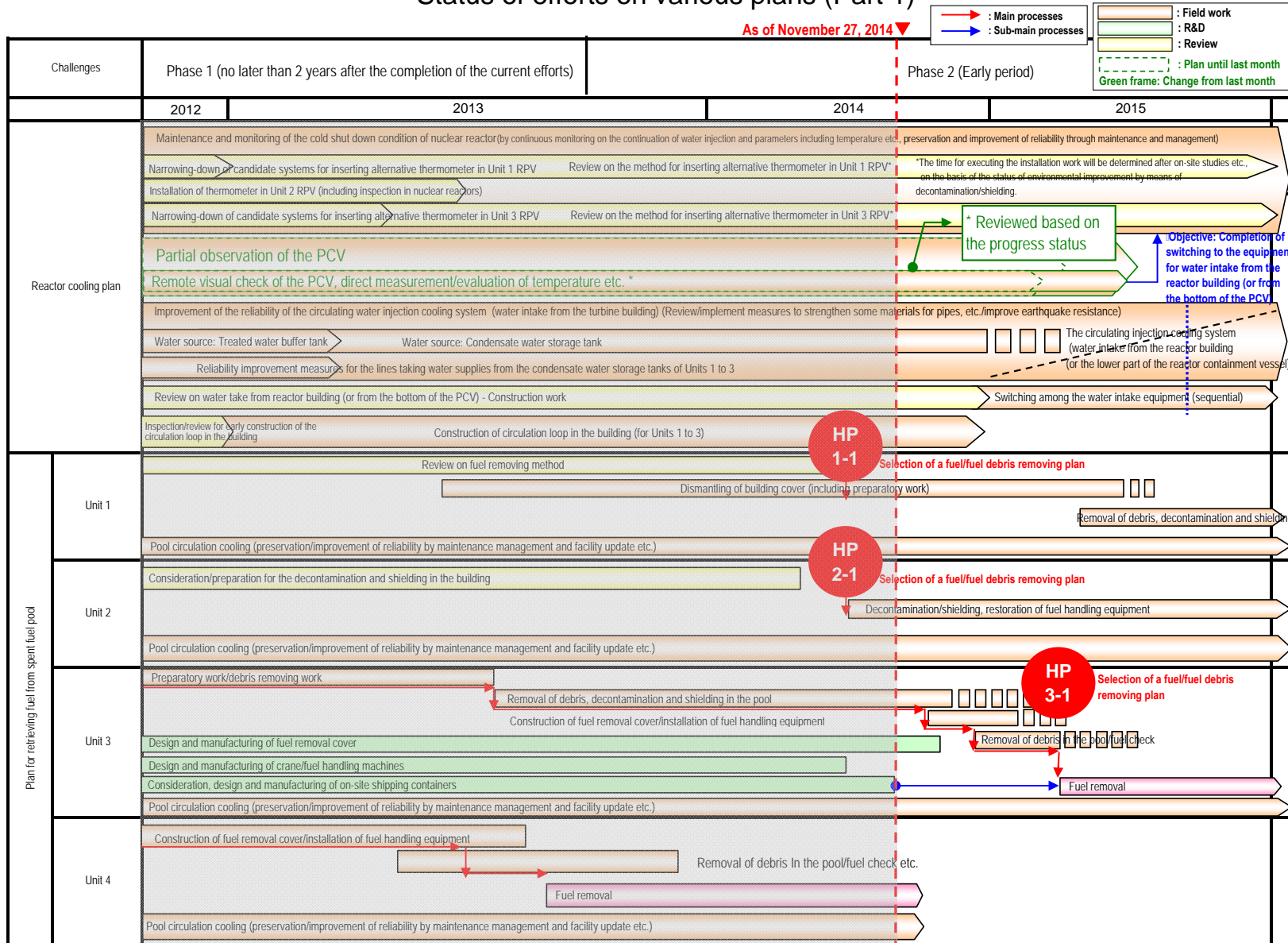
Temporary waste sludge storage

Provided by Japan Space Imaging Corporation, (C)DigitalGlobe



Status of efforts on various plans (Part 1)

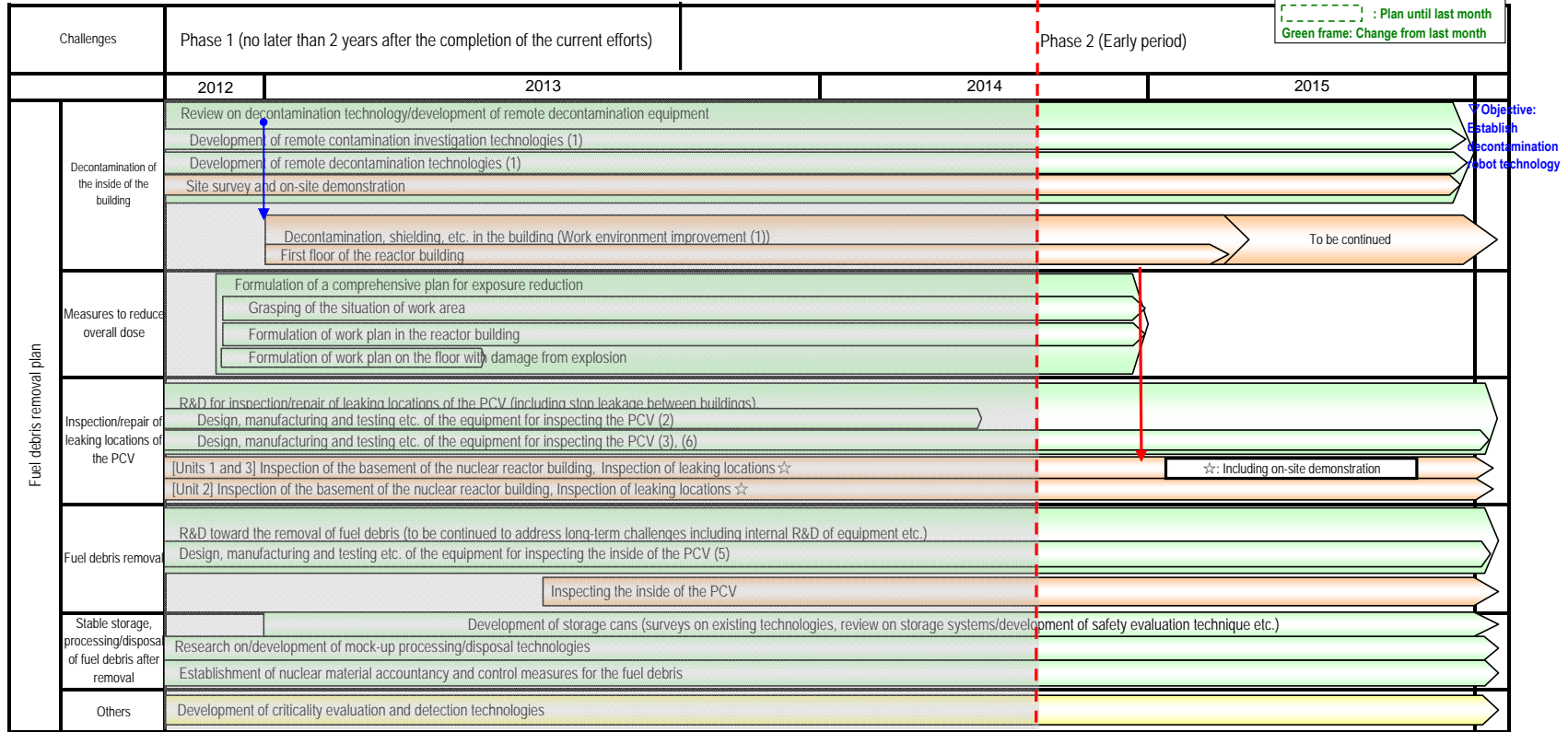
As of November 27, 2014



Status of efforts on various plans (Part 2)

As of November 27, 2014

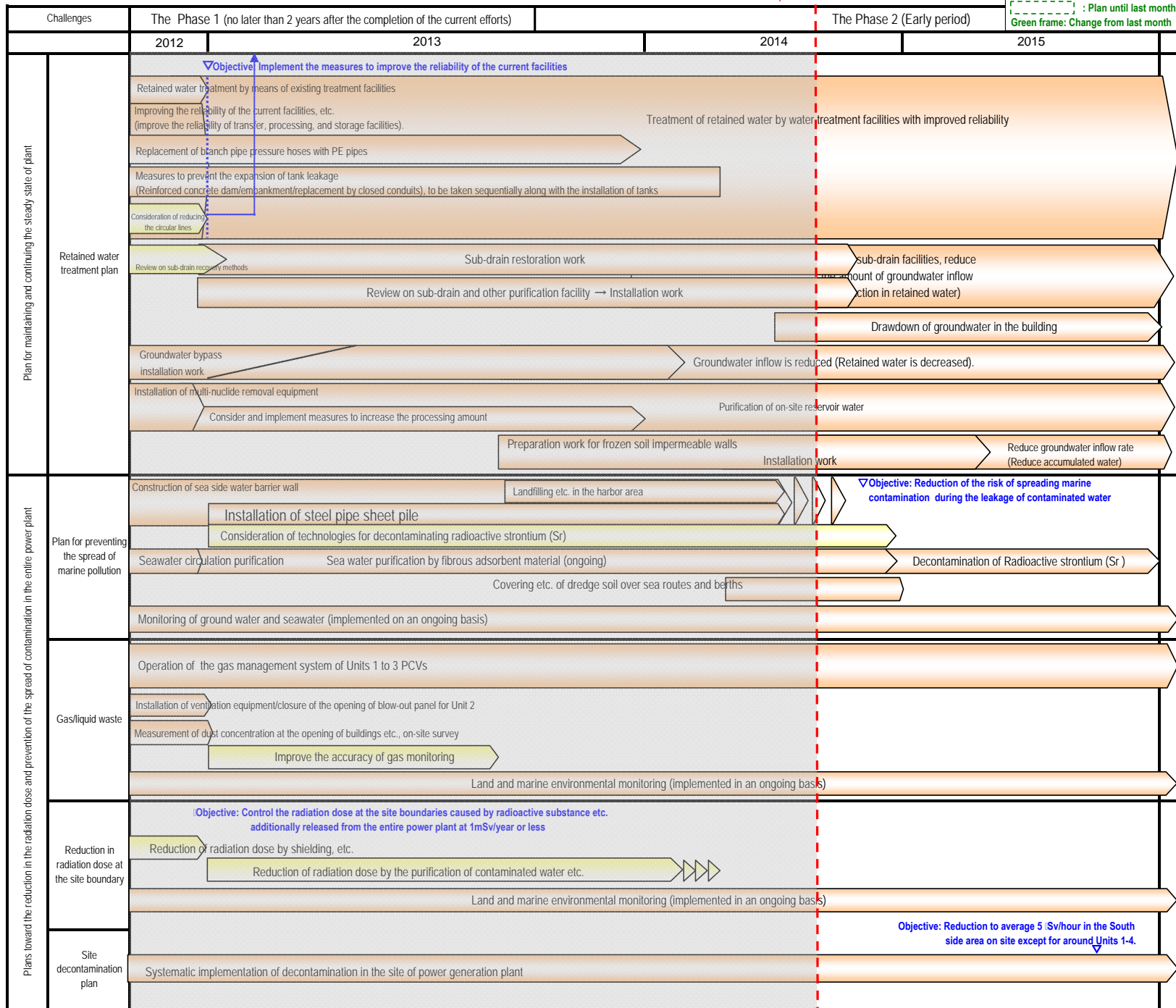
→ : Main processes
→ : Sub-main processes
 : Field work
 : R&D
 : Review
 : Plan until last month
 : Green frame: Change from last month



Status of efforts on various plans (Part 3)

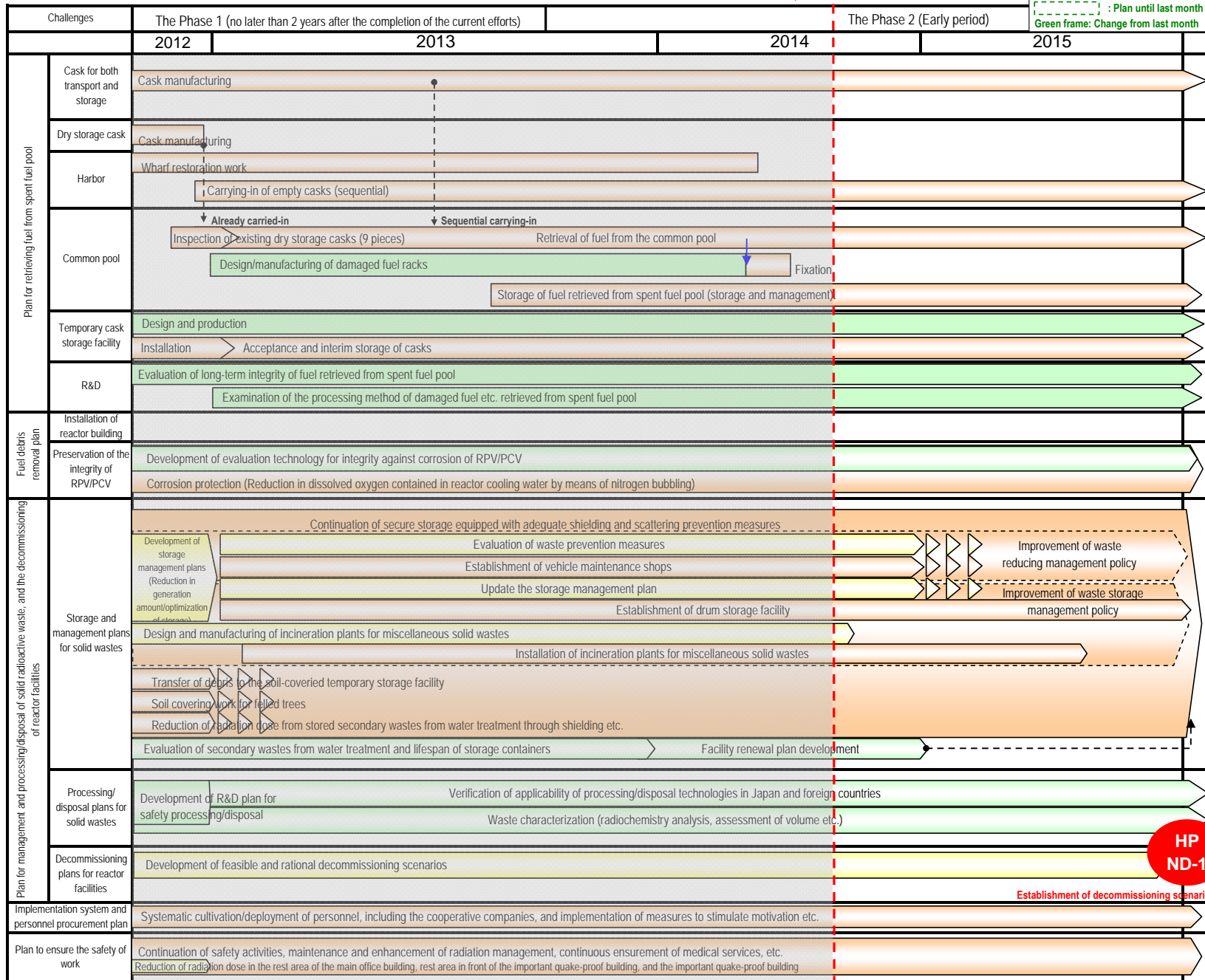
As of November 27, 2014

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



Status of efforts on various plans (Part 4)

As of November 27, 2014 ▼



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 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.

On November 5, 2014, within a year of commencing work to remove the fuel, all 1,331 spent fuel assemblies in the pool had been transferred.

The transfer of spent fuel will be completed in the next transportation and the remaining non-irradiated fuel assemblies will be transferred to Unit 6 SFP within December. When completed, all fuel assemblies will have been removed from Unit 4. Based on this experience, fuel assemblies will be removed from Unit 1-3 pools.

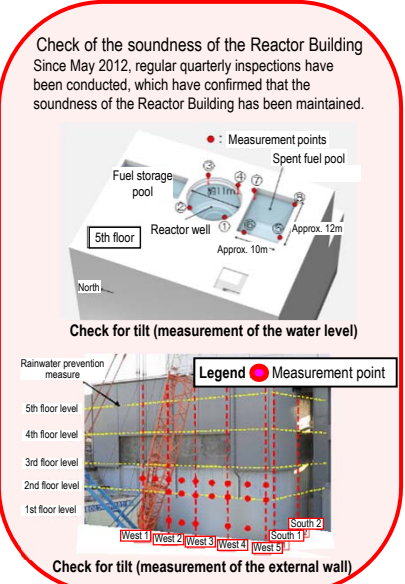
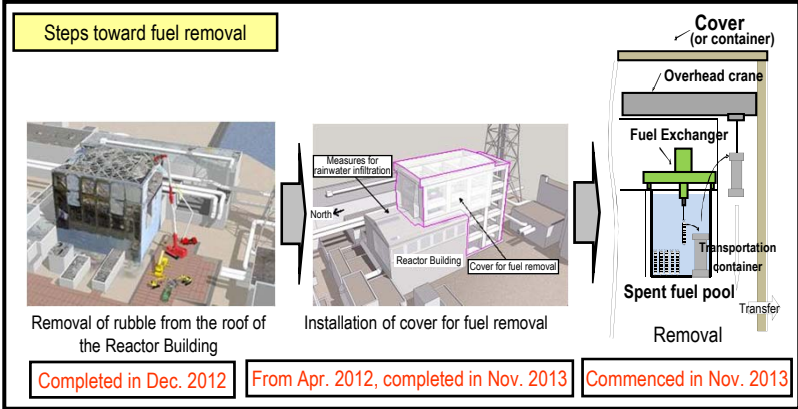


Fuel removal status



Loading the transportation container onto the trailer

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



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).



Photo taken on February 21, 2012



Photo taken on October 11, 2013

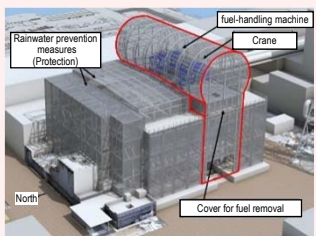
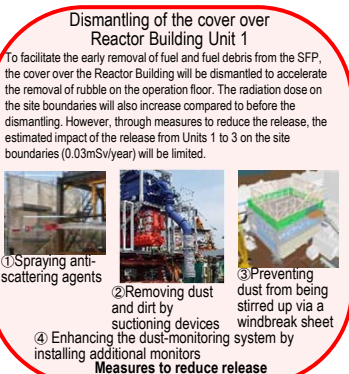


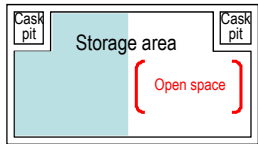
Image of the cover for fuel removal

Units 1 and 2

- Regarding Unit 1, there are plans to dismantle the cover over the Reactor Building to remove rubble from the top of the operating floor. Two roof panels of the Unit 1 Reactor Building (R/B) were removed to facilitate investigation of the rubble status on the R/B top floor. When the building cover is dismantled and the rubble removed, sufficient measures to prevent scattering of radioactive materials will be 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.

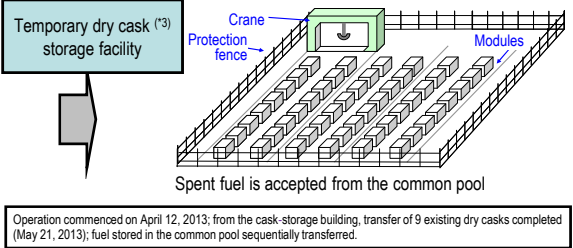


Common pool



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)



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.

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

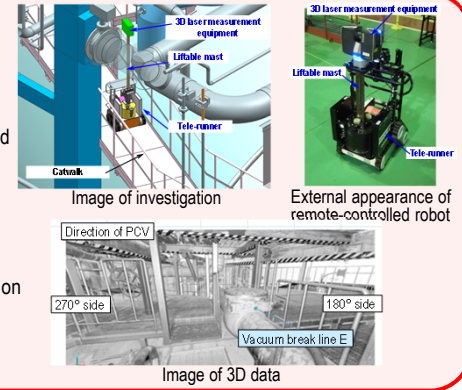
Immediate target	Identify the plant status and commence R&D and decontamination toward fuel debris removal
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3D laser scan inside the Unit 1 R/B underground floor

The upper part of the underground floor (torus room) of Unit 1 R/B was investigated with a laser scan using a remote-controlled robot, and collected 3D data.

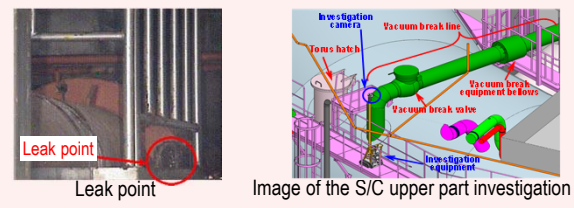
3D data, which allows examination based on actual measurements, can be used to examine more detailed accessibility and allocation of equipment.

Combining it with 3D data on the R/B 1st floor allows obstacles on both 1st and underground floors to be checked simultaneously. This allows efficient examination of positions to install repair equipment for PCVs and vacuum break lines.

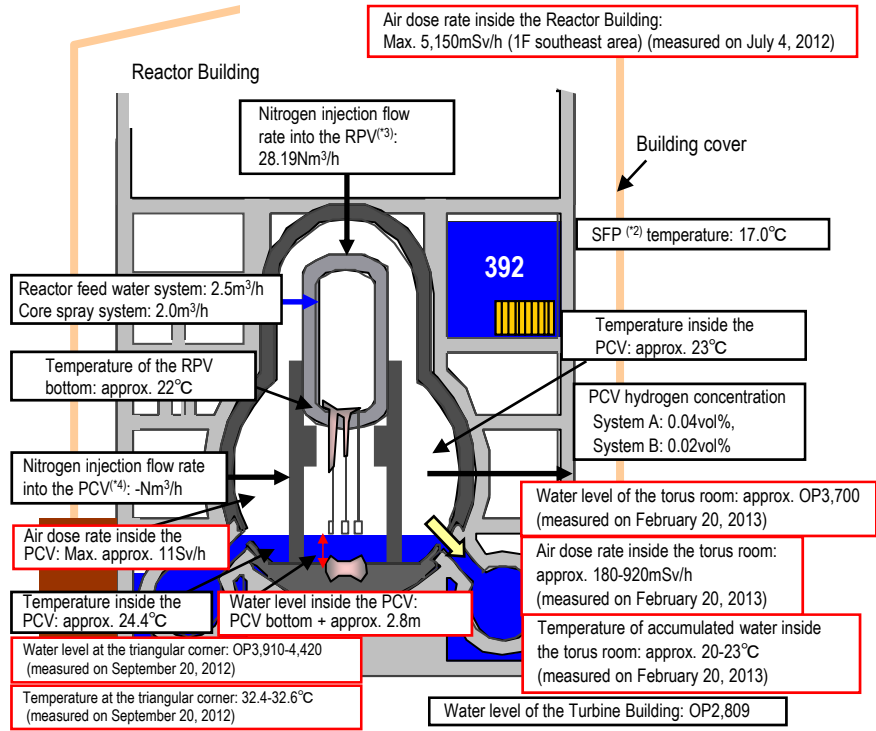


Investigation in the leak point detected in the upper part of Unit 1 Suppression Chamber (S/C^(*))

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.



Unit 1



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

Status of equipment development toward investigating inside the PCV

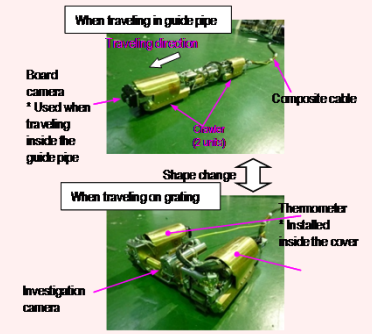
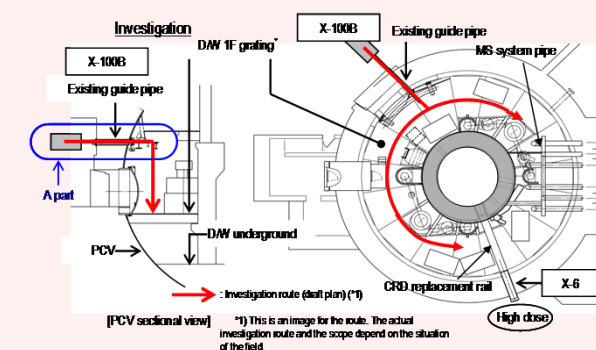
Prior to removing fuel debris, to check the conditions inside the Primary Containment Vessel (PCV), including the location of the fuel debris, investigation inside the PCV is scheduled.

[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.

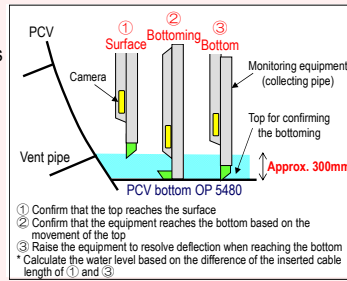


- <Glossary>
- (*) S/C (Suppression Chamber): Suppression pool, used as the water source for the emergent core cooling system.
 - (*) SFP (Spent Fuel Pool):
 - (*) RPV (Reactor Pressure Vessel)
 - (*) PCV (Primary Containment Vessel)
 - (*) Penetration: Through-hole of the PCV

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

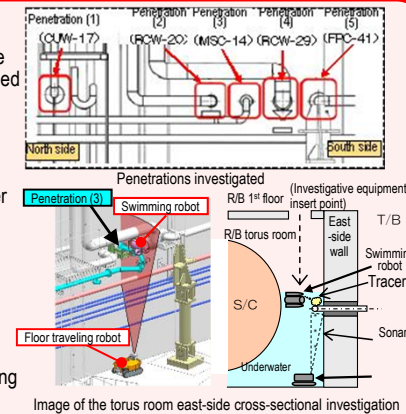
- (1) Replacement of the RPV thermometer
 - As the thermometer installed at the Unit 2 RPV bottom after the earthquake had broken, it was excluded from the monitoring thermometers (February 19).
 - On April 17, removal of the broken thermometer failed and was suspended. With the final aim of removing the thermometer, the on-site method is currently being selected through testing. The removal will be impermanent in around 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

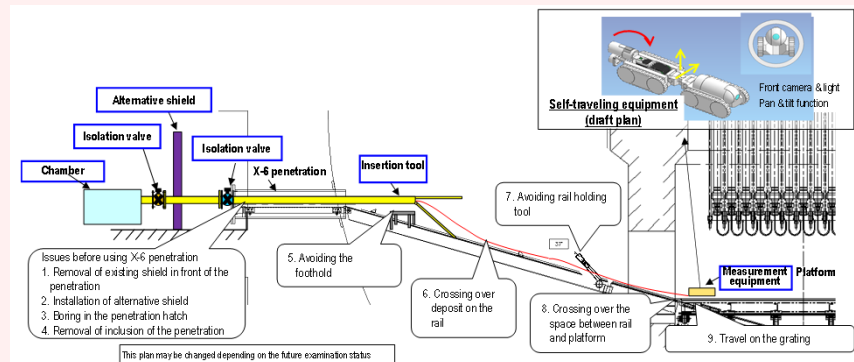
- The torus room walls were investigated (on the north side of the east-side walls) using equipment specially developed for that purpose (a swimming robot and a floor traveling robot).
- At the east-side wall pipe penetrations (five points), "the status" and "existence of flow" were checked.
- A demonstration 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 (*) 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)



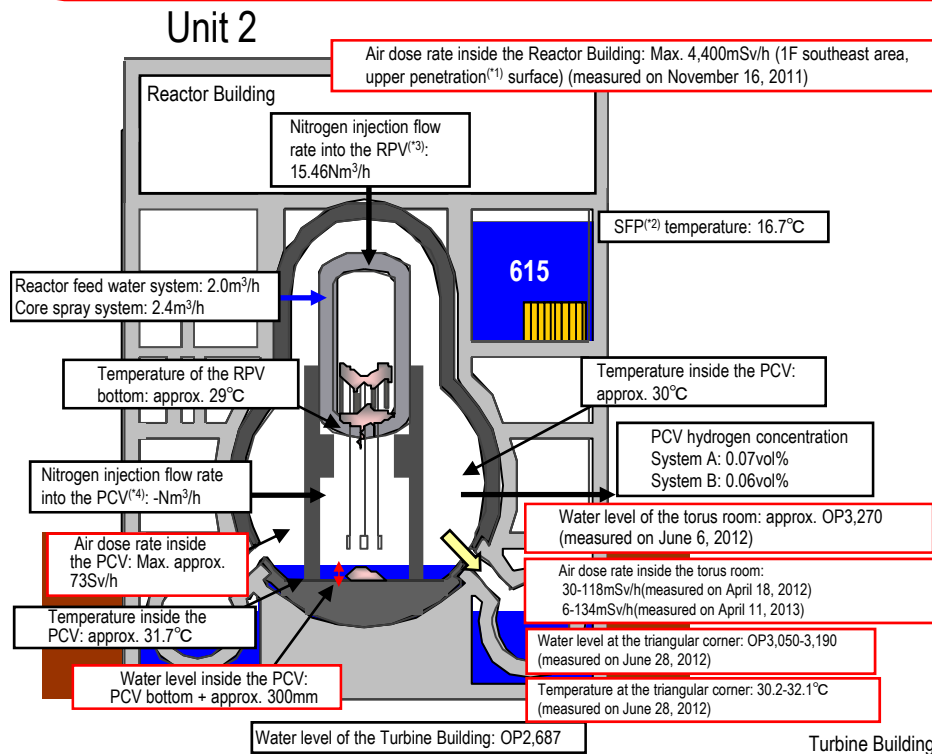
Status of equipment development toward investigating inside the PCV

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(*) 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.



<Glossary>
 (*) Penetration: Through-hole of the PCV (**) SFP (Spent Fuel Pool)
 (***) RPV (Reactor Pressure Vessel) (****) PCV (Primary Containment Vessel)
 (****) Tracer: Material used to trace the fluid flow. Clay particles



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

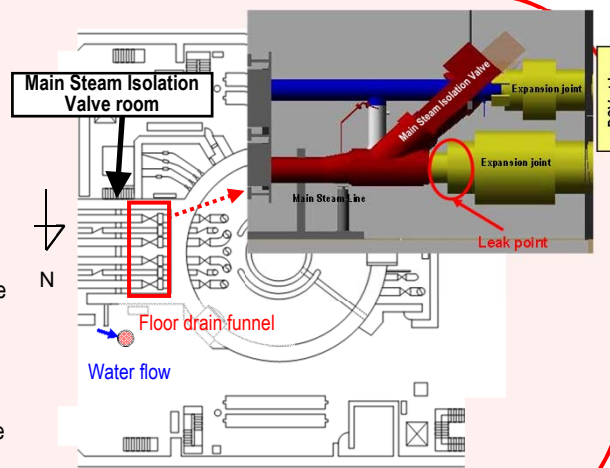
Immediate target Identify the plant status and commence R&D and decontamination toward fuel debris removal

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

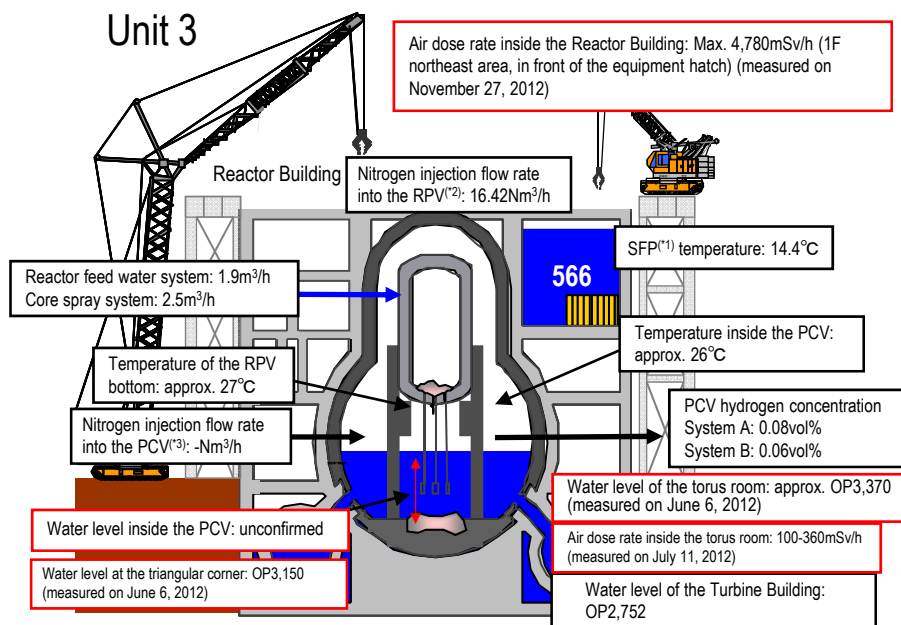
Decontamination inside R/B

- 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



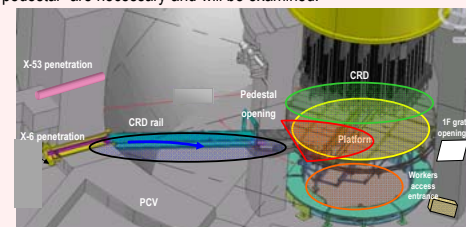
* Indices related to plant are values as of 11:00, November 26, 2014

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.



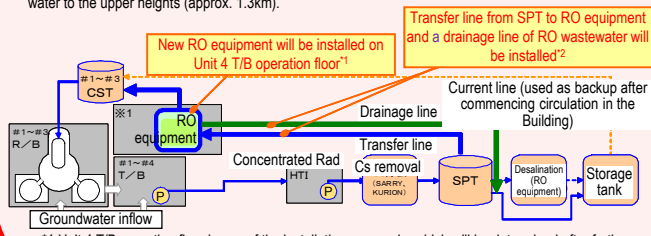
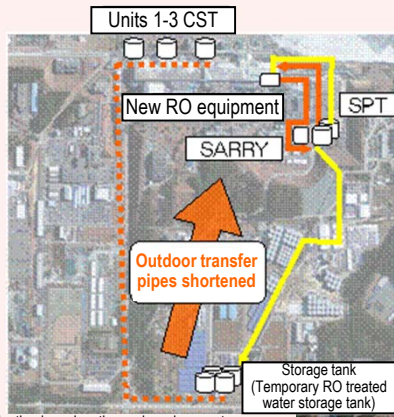
<Glossary>

- (1) SFP (Spent Fuel Pool)
- (2) RPV (Reactor Pressure Vessel)
- (3) PCV (Primary Containment Vessel)

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.

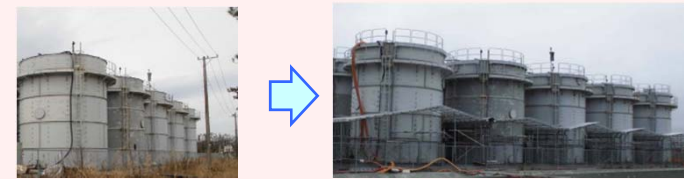
- Operation of the reactor water injection system using Unit 3 CST as a water source commenced (from July 5, 2013). Compared to the previous systems, in addition to the shortened outdoor line, the reliability of the reactor water injection system was enhanced, e.g. by increasing the amount of water-source 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.



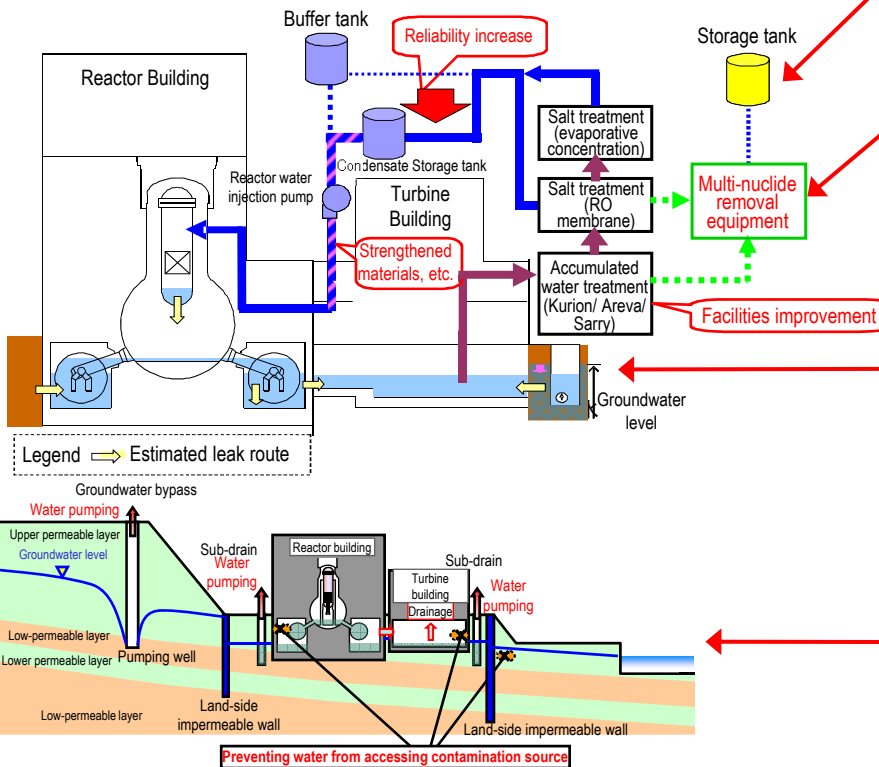
Before installing the fence cover

After installing the fence cover

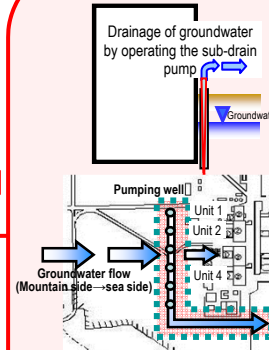
Risk reduction of contaminated water stored in tanks

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

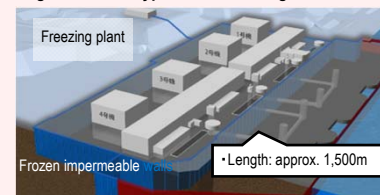


Aiming to reduce the level of groundwater by pumping subdrain water, tests were conducted to verify the stable operation of water treatment facilities, including subdrain. The results showed that through purification by the system, the density of radioactive materials declined to below the operational target and no other γ nuclides were detected.

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.

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

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

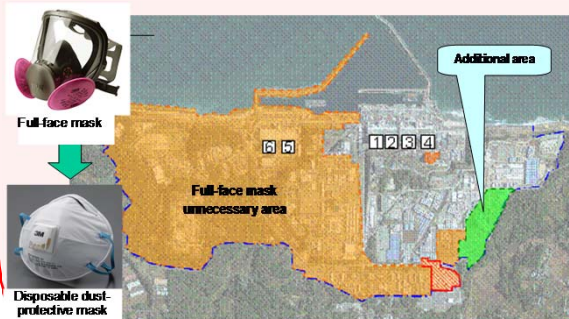
Progress toward decommissioning: Work to improve the environment within the site

<p>Immediate targets</p>	<ul style="list-style-type: none"> 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
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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.

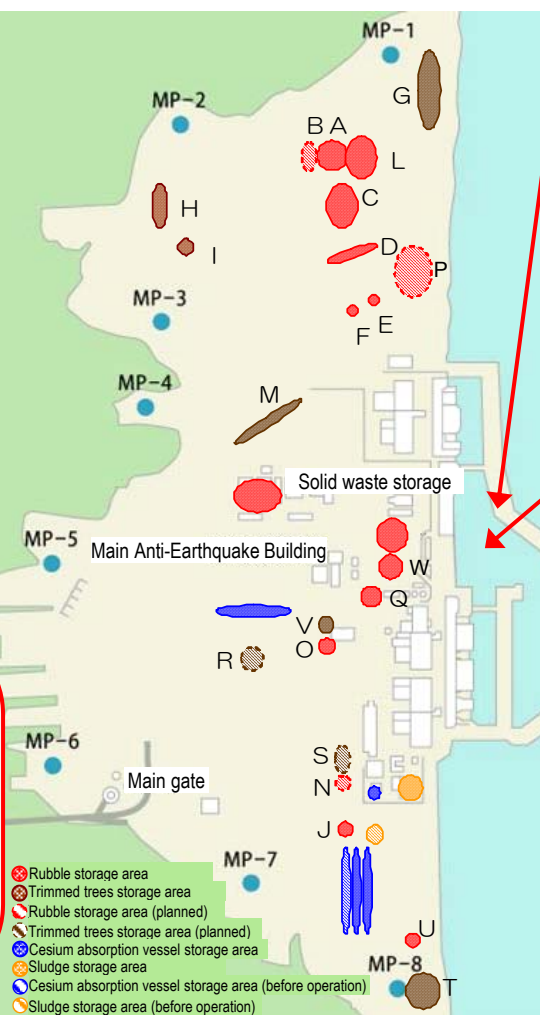


Full-face mask unnecessary area

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:

- 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)
- 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, 2014)
- 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 November 25, work to remove contaminated water and fill trenches with cement-based materials has got underway.
 - Unit 3: November 15, 2013 – July 28, 2014, treatment of cesium. Drilling of holes to install frozen/ temperature-measurement pipes is underway.

