

## Progress Status of Mid-and-long-Term Roadmap towards the Decommissioning of Fukushima Daiichi Nuclear Power Units 1-4, TEPCO (Digest Version)

### 1. Progress Summary

- Units 1~3's cold shutdown conditions are maintained; the temperatures at the RPV bottom and in the PCV gaseous part have stabilized (between 25 and 60 degrees as of Feb. 26), in addition, major parameters such as the PCV pressure and radioactive release rate from PCV showed no significant changes.

Although a deviation from the Limited Conditions for Operation (LCO) was reported in relation to the Unit 2 RPV bottom temperatures that should be kept below 80 degrees, the said instrument was determined to have been malfunctioning based on the assessment of the instrument's conditions. The corrected initial judgment of the LCO deviation was made effective from Feb. 12, and the temperatures will be monitored via other instruments.

While continuously checking the instruments' soundness, we have begun considering technical issues to come up with alternatives and realize diversification for temperature monitoring.

- In order to reduce radioactive emissions from the PCVs, PCV gas control system has been installed at Unit 3 and is presently being tuned up (Feb. 23~).
- As a part of an attempt to lift the radiation controls at the Main Anti-earthquake Building, we decontaminated the parking lot in front of the building followed by confirming that the radiation dosage had reduced (Jan. 5~Feb. 2).
- In order to reduce the radiation dosage at the site boundaries, we are planning to build temporary storage facilities with sand and sandbag covers shielding the rubble storage, etc. (mid of April ~). Preparation remains ongoing (Feb. 13~ mid of April).
- We checked the underwater visibility in the Unit 4's spent fuel pool and confirmed that the visible depth was around 5 meters (Feb. 9).

### 2. Past One Month Summary and Future Plans

#### 1) Plans to Maintain Plant's Cold Shutdown Conditions

##### ➤ Internal PCV Inspection at Unit 2

We are planning to conduct a second internal PCV inspection following the previous Jan. 19 inspection (refer to Fig. 1). The targets this time are as follows: to reconfirm that the reactor facility is maintaining "cold shutdown conditions" via checking the water level and temperatures of the accumulated water, and to obtain fundamental data via new PCV measurements of ambient dosage that will contribute to future plans.

##### ➤ Anti-freezing Countermeasures

Heat insulating materials have been installed in order to prevent leakage from reactor water injection facilities and/or water processing facilities due to freezing.

Furthermore, we are expanding the range of countermeasures that includes water removal and/or circulation methods at unused water lines as well as housing treatment.

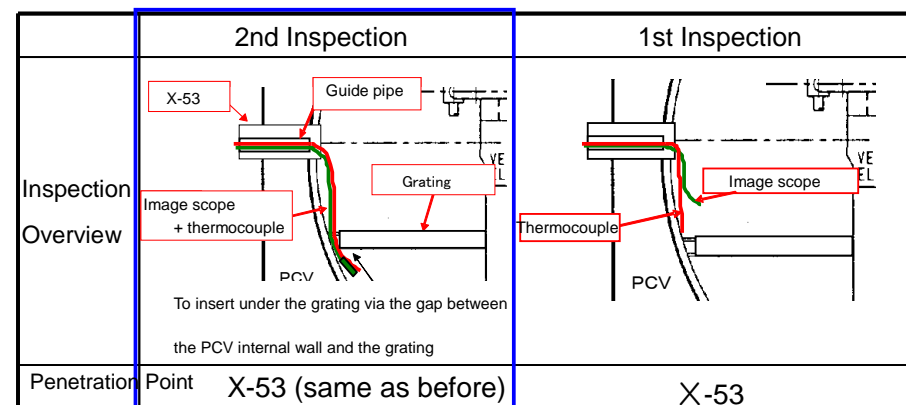


Fig.1 Unit 2's Internal PCV 2nd Inspection Overview

##### ➤ Consideration and Design of Multi-nuclide Removal Facilities

There are plans to install an Advanced Liquid Processing System (ALPS) to control the radioactivity concentration in the processed water of the current water processing facilities at an even lower level. The basic test shows that, out of the target nuclides, the  $\alpha$ -nuclide and the  $\gamma$ -nuclide particles can be removed to a level below the detectable limit. Furthermore, we are trying to identify the specific  $\beta$ -nuclide particles that still remain in significant volume for further purification (schedule to be finished in early Mar.).

##### ➤ Subdrain Water Purification Test

The purification test of the subdrain pit at the turbine building sides of Units 2 and 4 is on going in order to reduce the subdrain pit water level to suppress underground water inflow into the buildings that causes the increase of accumulated water inside the buildings (Jan. 10~).

##### ➤ Adding Tanks to Receive Processed Water

Tanks with a capacity of approx. 40,000 tons will be installed by April in addition to the current capacity of approx 165,000 tons. Additional countermeasures are being considered: replacing installed small capacity tanks with larger ones, and installing an underground water reservoir in spaces where large steel tanks can't fit.

#### 2) Plans to Reduce Overall Onsite Radiation Dosage and Mitigate Contamination

##### ➤ Seaside Installation of Water Barricades

Prior to installing seaside water barricades, the obstacles at the front of Units 1~4's water intake channel such as seafloor rubble was cleared away (Jan. 13~23).

##### ➤ Additional Countermeasures for Mitigating Contamination

There are plans to cover and solidify the seabed soil in front of the intake channel (early Mar. ~ Jun.). Onsite preparations are underway to test the effectiveness of these methods. Silt fences will be added to the sides of Units 5 and 6 in March.

##### ➤ Installation and Operation of the PCV Gas Controlling System

This system can extract and control the gas inside the PCV in order to reduce the amount of radioactive particle emissions from the PCV. The systems are operating normally at Units 1 and 2, and being tuned up at Unit 3 (Feb. 23~).

##### ➤ Effective Radiation Dose at Site Boundaries

- In order to reduce the radiation dosage at the site boundaries, we are planning to build temporary storage facilities with sand and sandbag covers shielding the storage of rubbles, etc. (mid -Apr. ~). Preparation remains ongoing (Feb. 13 ~ mid-Apr.) (refer to Fig. 2).
- Countermeasures for improving the environment around the monitoring posts have begun in order to enhance the monitoring accuracy of the radioactive material emissions (Feb. 10~).

##### ➤ Systematic Onsite Decontamination

- We conducted decontamination work at the parking lot in front of the Main Anti-earthquake Building and confirmed the reduction of radiation dosage (Jan. 5~Feb. 2) (refer to Fig. 3). Further decontamination is under consideration (within March).
- Onsite surveys, determine effective decontamination location, and draft an overall plan to achieve onsite decontamination (Feb. 6~ Mar. (scheduled)).

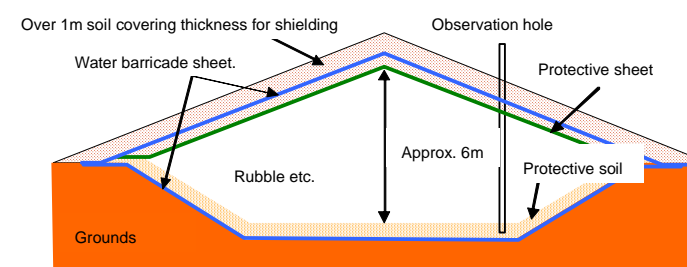


Fig. 2 Image of Temporary Storage Facility of Rubble etc



Fig.3 Reducing Dosage Levels in front of the Main Anti-earthquake Building

### 3) Plan to Remove Fuels from Spent Fuel Pools

- Rubble Clearing from the Upper Part of the Reactor Buildings of Units 3 and 4 (ongoing)
- Unit 4 Spent Fuel Pool Underwater Visibility Confirmation  
To prepare for the investigation of the rubble distribution conditions in the Unit 4 spent fuel pool (start from mid-to-late March (pending)), we took photos inside the pool using an underwater camera, and confirmed the underwater visibility depth of approximately 5m (Feb. 9) (refer to Fig. 4).
- Common Pool Restoration  
In order to store the fuels to be removed from the spent fuel pools, the common pool is being restored (ongoing); the overhead crane was restored by Jan. 26, equipment to be restored by March, power sources to undergo temporary restoration by April.
- Investigation of Unit 2 Reactor Building Refueling Floor Situation  
In preparation of the future fuel removal that will be done at the Unit 2 reactor building refueling floor, out of the options available at the moment, we will conduct investigations using a remote control robot "Quince" (Scheduled on Feb. 27) (refer to Fig. 5).

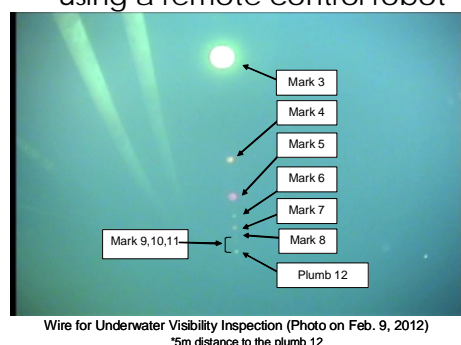
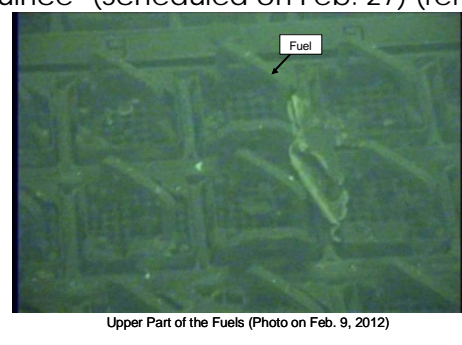


Fig. 4 Inside Unit 4's Spent Fuel Pool



Upper Part of the Fuels (Photo on Feb. 9, 2012)



Fig. 5 Remote Control Robot "Quince"

### 4) Fuel Debris Removal Plan

- Decontaminating the Insides of Buildings  
Design equipment to investigate contamination levels and prepare to conduct experiments using contaminated objects.
- Inspection and Repair of PCV Leakage Points  
Inspection and repair methods are under consideration. Via a water tank experiment, test materials are used to prevent water leakage between buildings.
- Fuel Debris Removal  
The best access route for internal PCV inspections, etc. presently considered.
- Maintaining RPV/PCV soundness  
Test conditions for soundness evaluation are under consideration.

### 5) Plan for Reactor Facilities Demolition and Radioactive Waste Processing & Disposal

- Treatment & disposal of secondary waste generated via contaminated water processing
  - Various sorts of characteristic tests for the long-term storage of water processing secondary waste are ongoing.
  - The accumulated water and outlet water samples of the water processing facilities have been delivered to JAEA, who are analyzing the radioactivity concentration of each type of nuclide in the water.

### 6) Organization and Staffing Plan

- Staff Management
  - The necessary manpower for the March work is expected to be procured.
  - Personnel rotation goes smoothly balancing both the exposure dose and quality of onsite work (132 TEPCO employees have been transferred since last October).
  - Present local employment rate is 59% (Partner companies' staff).

- Work & Living Environment Improvements
  - We have prioritized the action items that need to be implemented to improve on the work & living environment and began consideration of improvement measures.
  - On Jan. 27, a meeting was held with our partner companies to improve the work environment. Such meetings will continue to be held periodically.

### 7) Plan to Secure Worker Safety

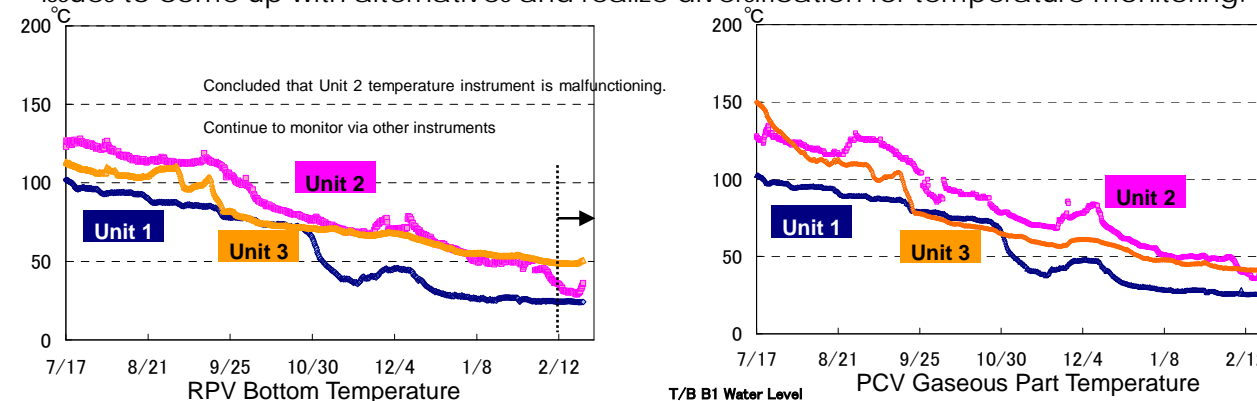
- Consider lightening Restrictions on Protective Equipment Requirements  
From March 1<sup>st</sup>, we will drop the requirement that the Tyvek uniform must be worn while moving from outside of the 1F site to the Main Anti-earthquake Building and to the Service Building of Units 5&6 and will change the full-face mask filter (charcoal filter -> dust filter) for outside work (announced at the Safety Promotion Conference on Feb. 23).
- Helicopter Transportation of Sick or Injured persons (AKA Doctor Helicopter)  
The Doctor Helicopter at 2F has begun operations (Feb. 14). Transportation training will be conducted and environmental measurements will be done without water spray operations (early March).
- Long-term health care  
The "Health Consultation Office" at TEPCO Headquarters will be open from Feb. 28.
- Lift radiation controls at the Main Anti-earthquake Building  
Dosage reduction measures are being implemented in order to lift radiation controls at the Main Anti-earthquake Building (laying lead plates on floors and walls, etc.).

End

### (Reference) Plant Status

#### 1) Plant data

- Units 1-3's cold shutdown conditions are being maintained; the temperatures at the RPV bottom and in the PCV gaseous part have stabilized (between 25 and 60 degrees as of Feb. 26), in addition, major parameters such as the PCV pressure and radioactive release rate from PCV showed no significant changes. Besides, in light of the temperature instrument failure at the Unit 2 RPV bottom, while continuously checking the instruments' soundness, we have begun considering technical issues to come up with alternatives and realize diversification for temperature monitoring.



#### 2) Transition of the amount of accumulated water

- The total amount of accumulated water level has decreased to the tentative target level of O.P. 3000 during STEP 2, which shall be maintained via stable operations of the processing facility afterward.

