Soundness Verification of Unit 4 Reactor Building at Fukushima Daiichi Nuclear Power Station

May 16, 2012

Tokyo Electric Power Company

TEPCO 東京電力

1. Purpose of Soundness Inspection

In response to the concern that Unit 4 spent fuel pool may collapse, we have provided the explanations below to prove its soundness. We will continue our regular inspection 4 times a year to ensure soundness until the fuel is removed.

1. We have confirmed that the building has not tilted by measuring the distance between the water surface of the spent fuel pool and the floor surface of the building.

2. Our analysis result shows that the reactor building including the spent fuel pool will not collapse even if an earthquake equivalent to the Tohoku-Pacific Ocean Earthquake (seismic intensity 6) occurs in the area.

3. The seismic safety margin has improved by more than 20% by reinforcing the bottom of the spent fuel pool.

4. Regular inspection (4 times a year) is done to confirm the soundness of the reactor building and the spent fuel pool.

2. Inspection Overview

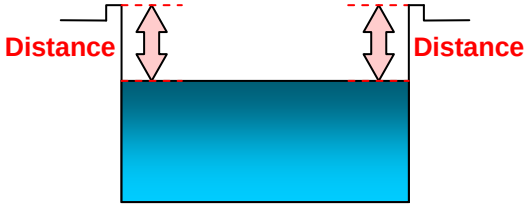
The following 4 points are included in the regular inspection.

1. Building tilt measurement (Water level)
2. Building tilt measurement (Outer wall)
3. Visual inspection
4. Concrete strength verification

3-1. Building Tilt (Water Level Measurement)

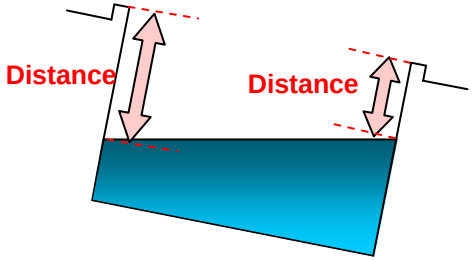
The distances between the floor surface and the water levels of the reactor well and spent fuel pool are measured to check if the building is tilted or not. (It has already been confirmed that the building is not tilted based on the measurement results acquired on February 7, 2012 and April 12, 2012.)

1) Building not tilted

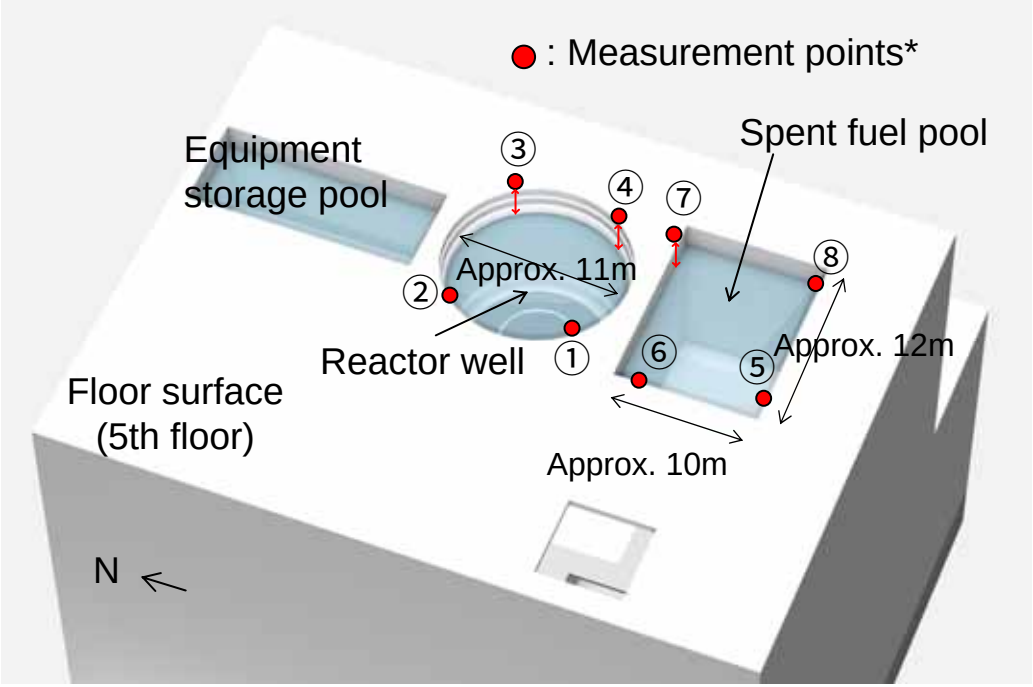


The distances are the same

2) Building tilted



Difference in the distances



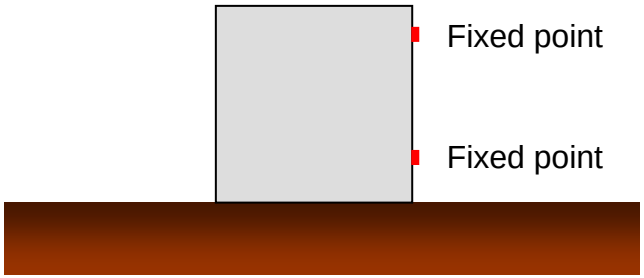
Measurement Points (Floor surface of the 5th floor)

* The measurement points are set according to the progress statuses of debris removal and cover installation for fuel removal.

3-2. Building Tilt (Outer Wall Measurement)

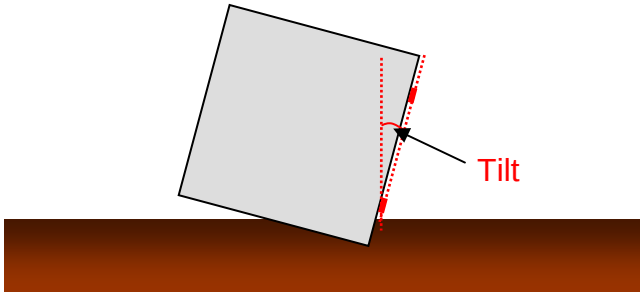
The outer wall perpendicularity is measured by using an optical equipment (fixed points set on the upper and lower side of the wall).

1) Building not tilted

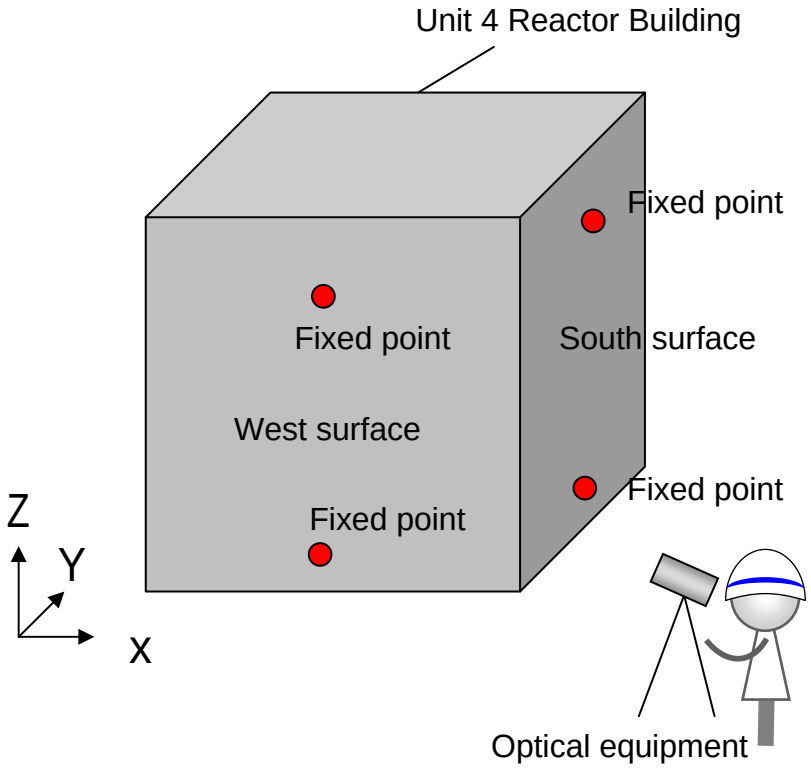


No tilt

2) Building tilted



Tilted

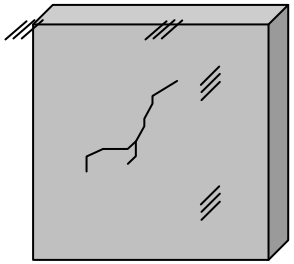


Measurement

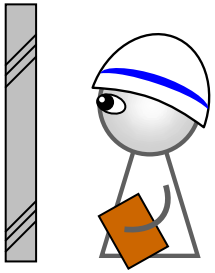
* North/East surfaces cannot be measured they're blocked by existing buildings.

3-3. Visual Inspection

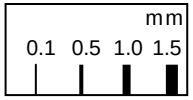
The concrete floor and walls of the spent fuel pool (building frame) are visually inspected for defects such as cracks. In the case that cracks with the width of 1mm or more are found, repair must be done as appropriate.



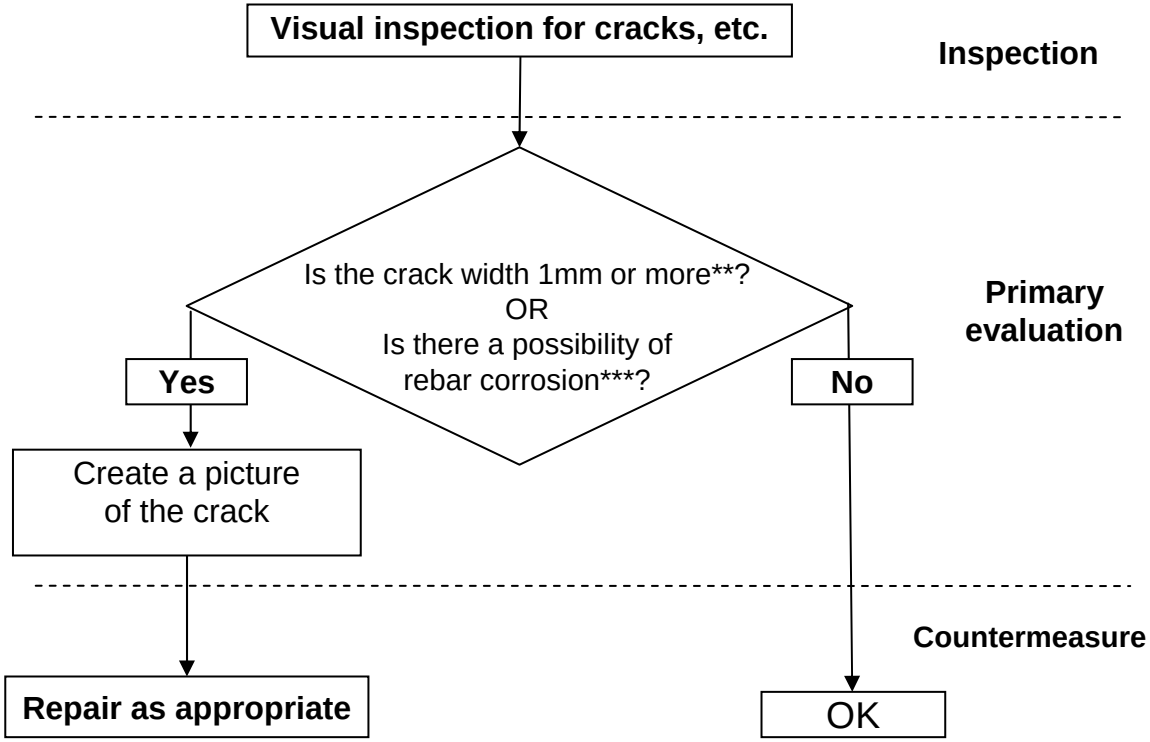
Check for cracks on the walls and the floor



Visual inspection



Crack scale* (Sample)

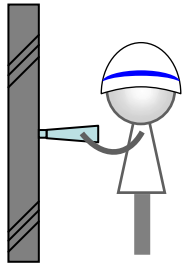


Flow of Visual Inspection

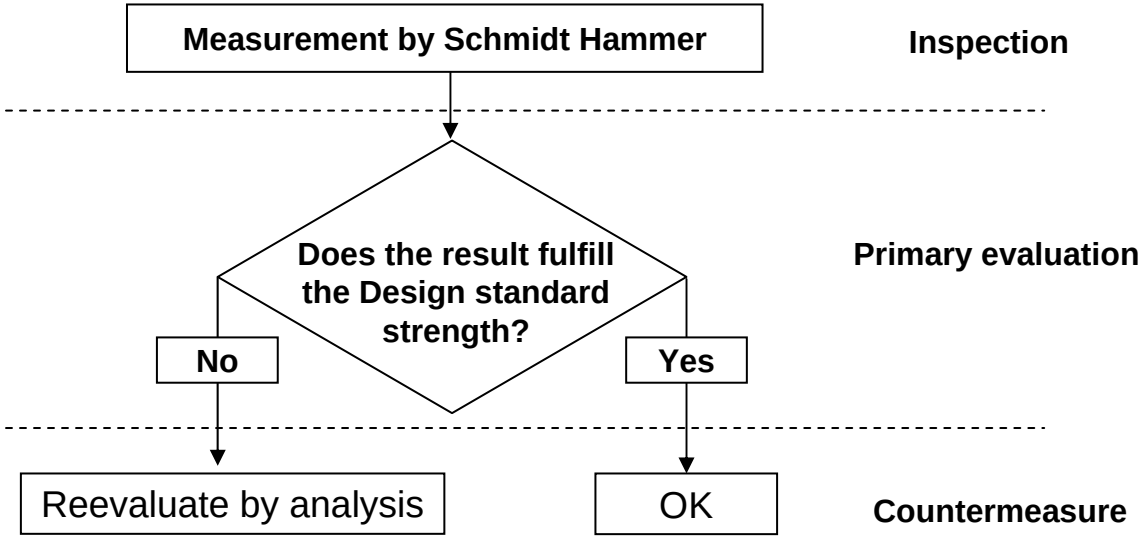
* Crack scale: Used to measure the width of a crack. (Put the scale on a crack to measure its width.)
** In the case that the crack width is 1mm or more, the durability of the building must be reviewed in accordance with "Maintenance and Management of Structures in Nuclear Facilities" specified by the Architectural Institute of Japan.
*** In the case that rebar corrosion which may affect the durability of the building is found.

3-4. Concrete Strength Verification

The concrete strength of the spent fuel pool is measured by non-destructive inspection techniques (such as Schmidt Hammer*) to confirm that the strength fulfills the design standard.



Non-destructive inspection (Schmidt Hammer)

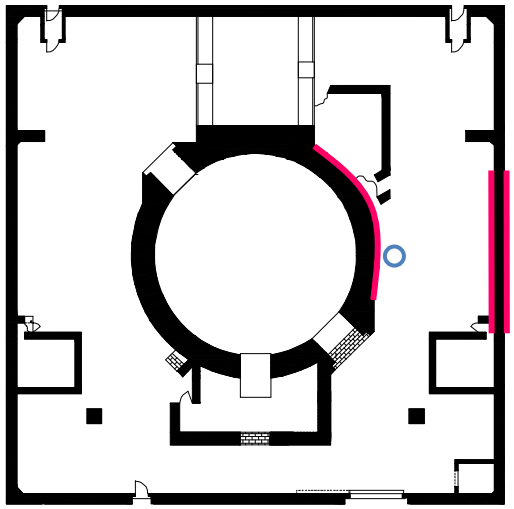


Flow of Non-destructive Inspection

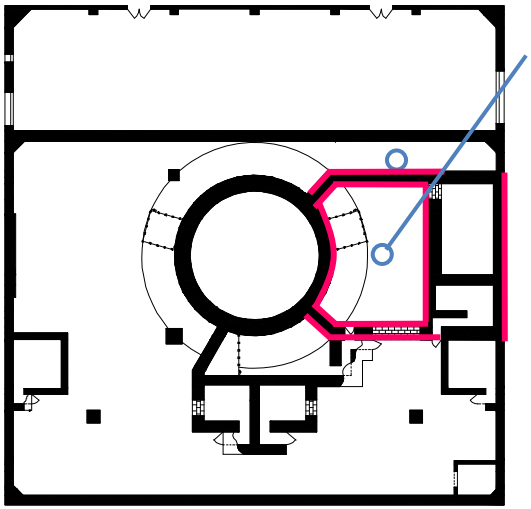
* Schmidt Hammer Technique: A non-destructive inspection technique to estimate concrete strength by hammering the concrete and measuring the impact returned.

4. Areas Subject to Inspection

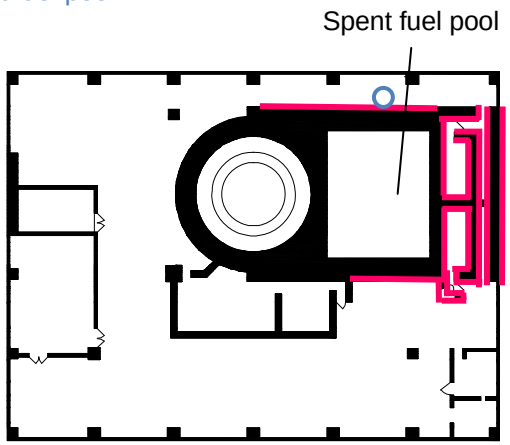
The proposed areas subject to inspection are indicated in the plans below. Inspection is done within the range in which safety is ensured, considering the factors such as debris and radiation dose.



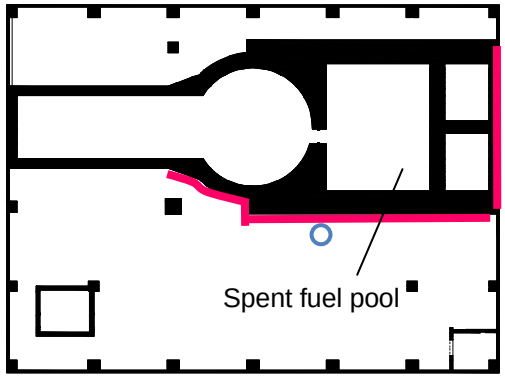
1st Floor



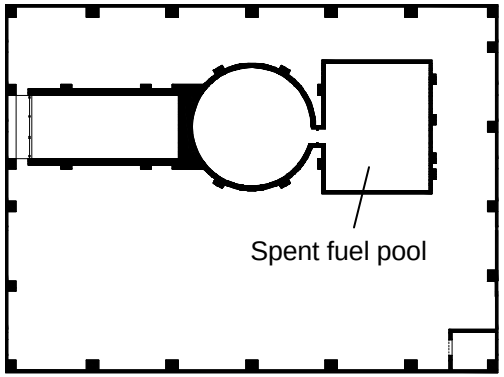
2nd Floor



3rd Floor



4th Floor



5th Floor

Legend:

- Visual inspection
- Concrete strength verification

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5. Schedule: May 2012 (1st Inspection)