

Fukushima Daiichi Nuclear Power Station Progress with Preparations for Unit 1 Fuel Removal from the Spent Fuel Pool

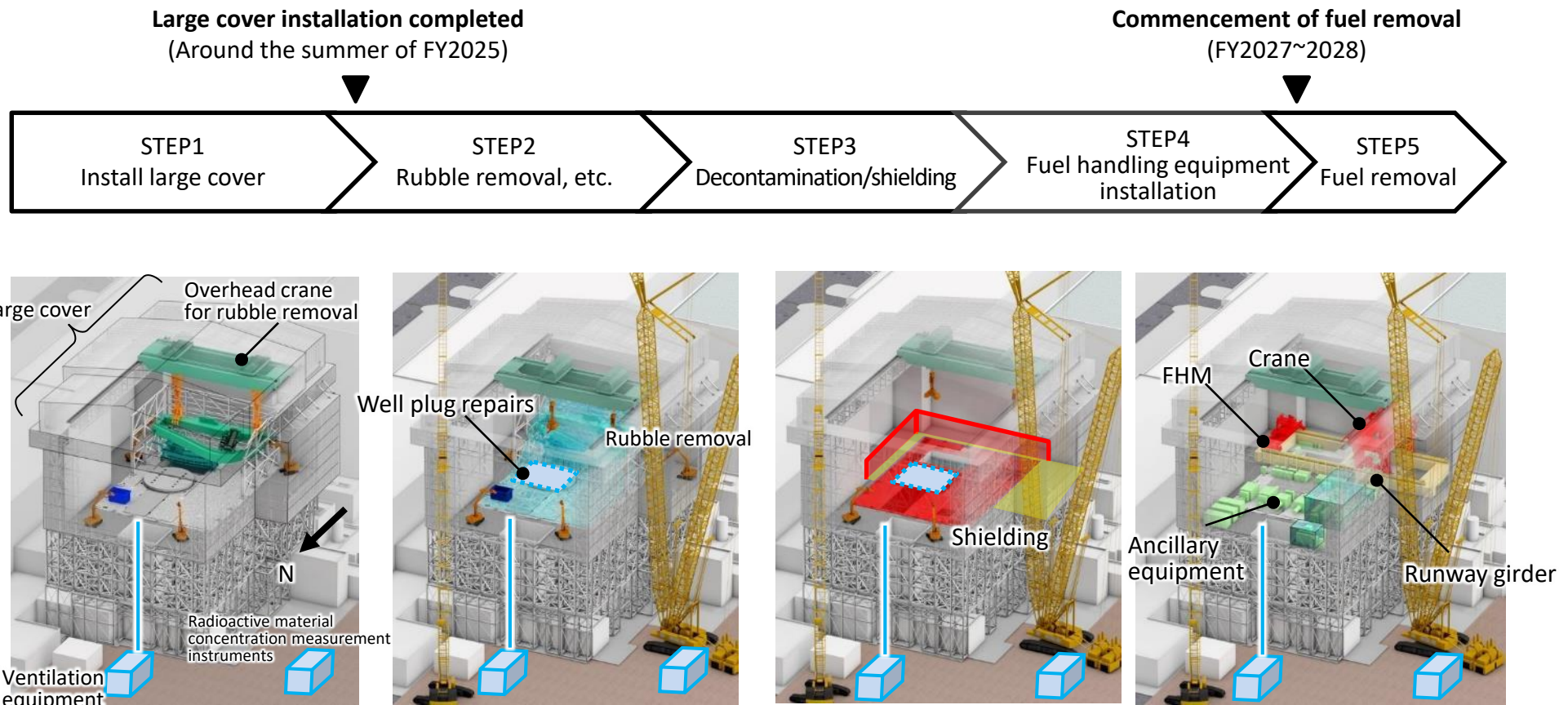
March 27, 2025



Tokyo Electric Power Company Holdings, Inc.

1. Fuel removal from the spent fuel pool plan overview

- The 392 fuel assemblies are being stored in the Unit 1 spent fuel pool will be removed in order to relocate them to the common pool where they can be cooled and stored in a more stable manner.
- Prior to fuel removal, a large cover that encompasses the entire reactor building will be built, rubble removed from under the large cover, the operating floor decontaminated/shielded, and fuel handling equipment (fuel handling machine (FHM) and crane) installed.



※These are just concept diagrams and actual location may differ

2-1. Large cover installation status (off-site)

- Semi-assembly of the temporary work platform, bottom framework, upper framework and box ring have been completed.
- Semi-assembly of the retractable roof is underway. (Four out of eight blocks completed)

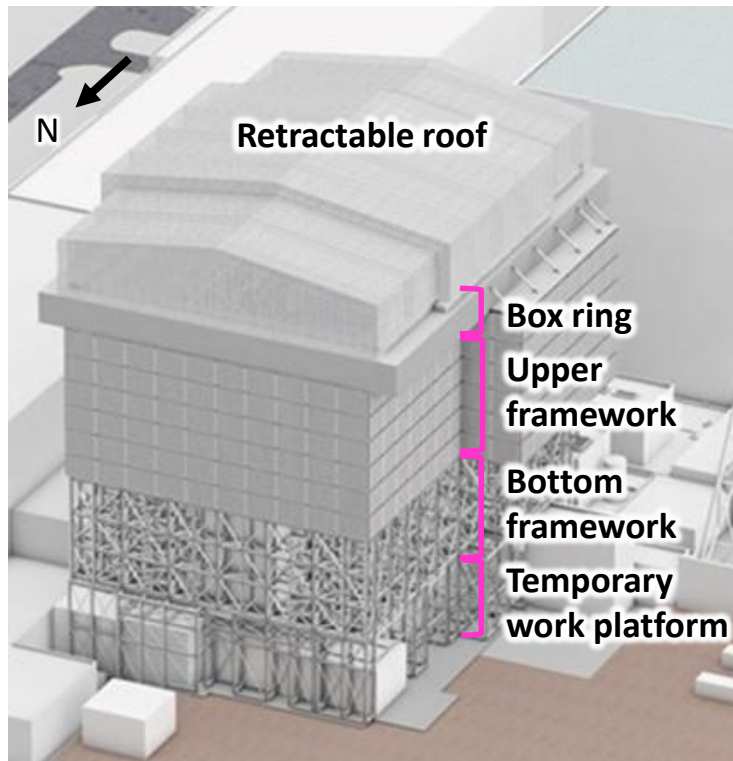
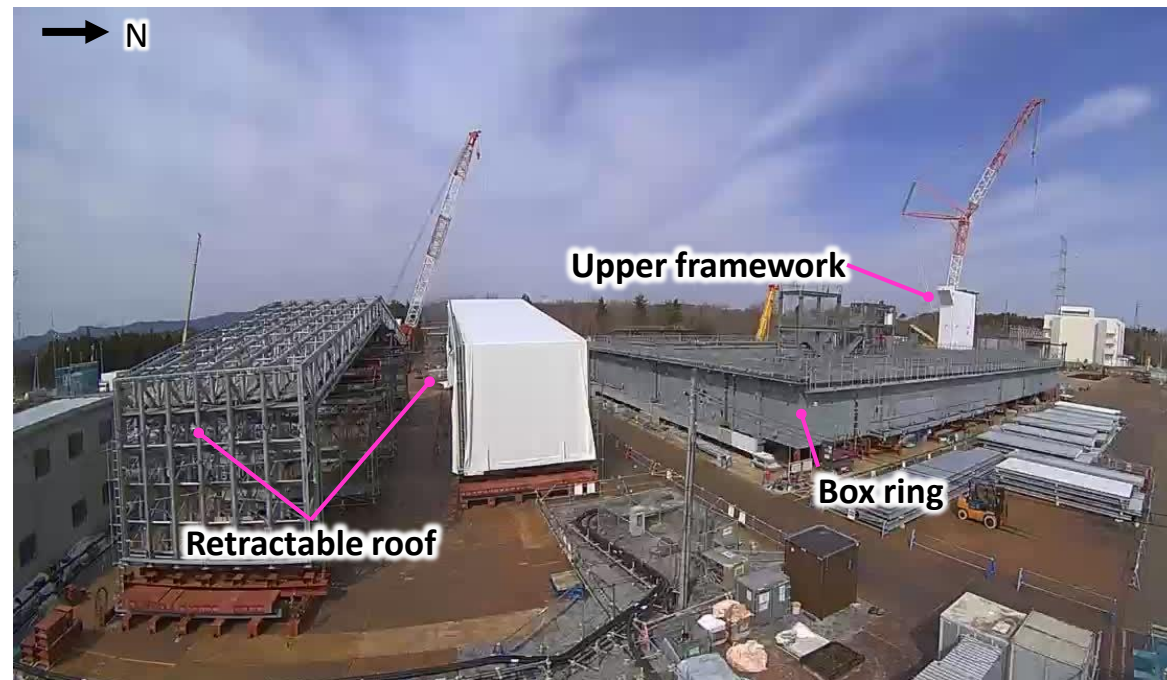


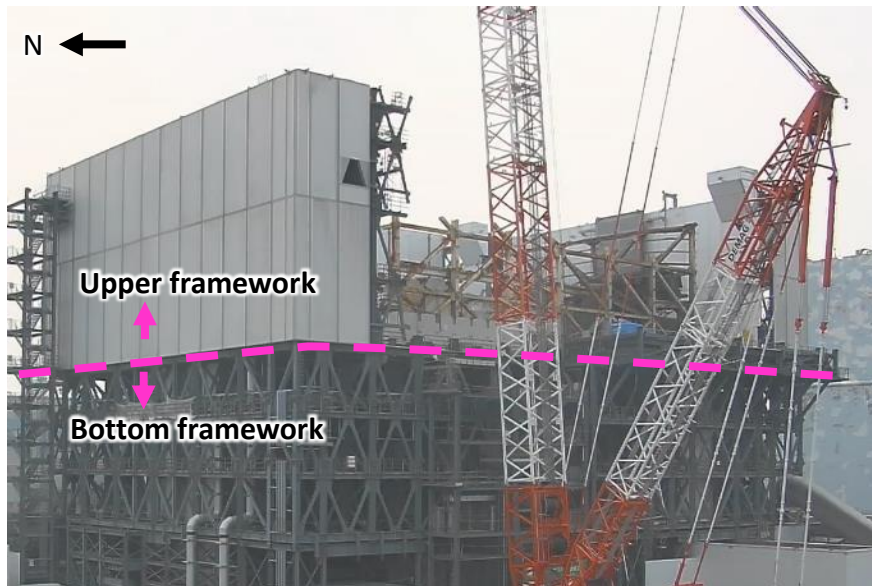
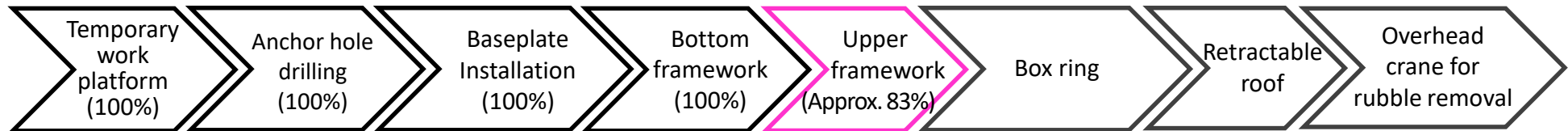
Diagram of the entire large cover



Off-site yard (photographed on March 24, 2025)

2-2. Large cover installation status (on-site)

- Installation of the upper framework is underway. (10 out of 12 blocks completed)
- Currently, dust dispersion prevention agents to be regularly scattered, the crane to spray water, and a mist spraying device are used to prevent the dispersion of dust. However, once the east side upper framework installation is completed, use of the mist spraying device will be suspended. Dust dispersion prevention agents will continue to be regularly scattered and the use of the crane to spray water when dust is churned up will continue until completion of the large cover.



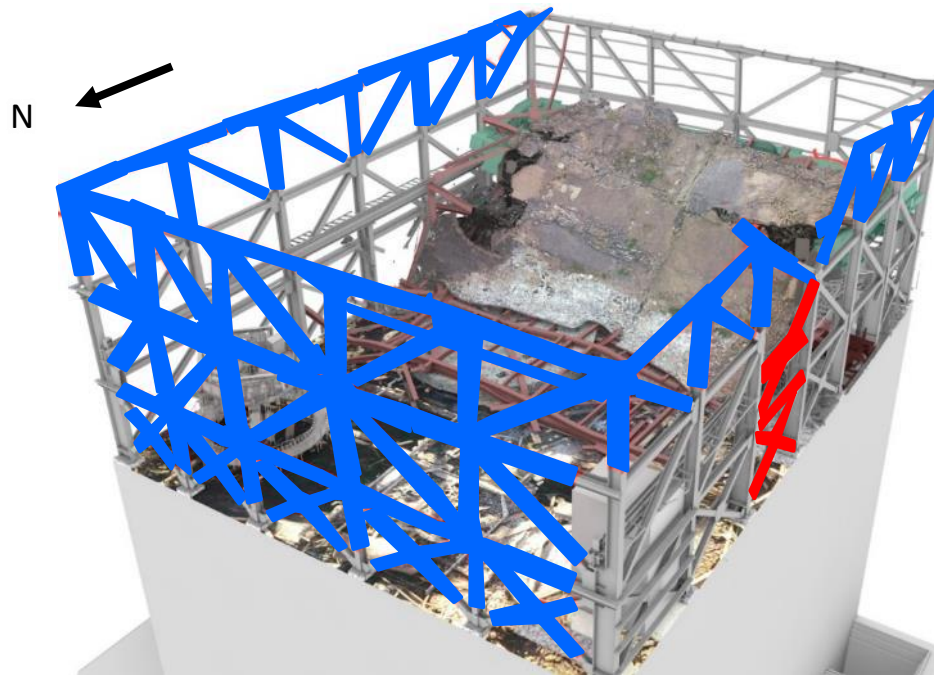
On-site conditions (Northwest side)
(Photographed on March 26, 2025)



On-site conditions (Southeast side)
(Photographed on March 26, 2025)

3. Removal of outer frame

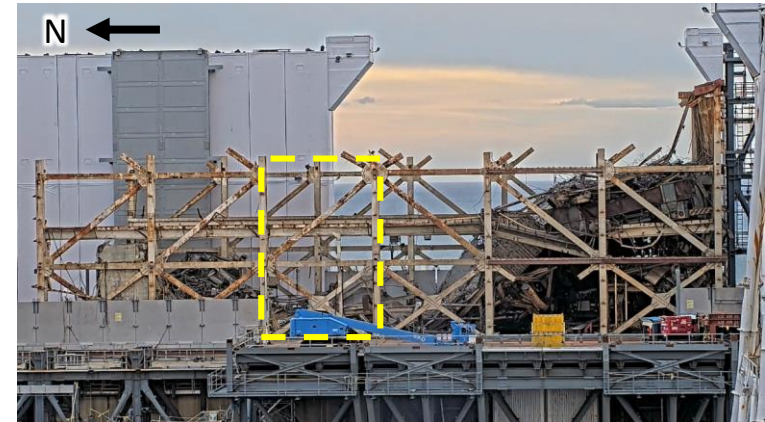
- Portions of the outer frame are being removed in order to reduce the risk of contact with the large cover and to improve seismic resistance.
- Removal of portions of the frame on the east and north sides have been completed, and the removal of a portion of the frame on the west side is underway.



■ Portions that have already been removed (as of March 25, 2025)

■ Planned the scope of removal

※ The scope of removal may change in accordance with work plans/field conditions



Entire structure (photographed on March 11, 2025)

■ Area left to be removed



Work status (photographed on March 11, 2025)

4-1. Additional covering added to spent fuel pool gate

- Prior to Unit 1 fuel removal, rubble will be removed from under the large cover.
- The auxiliary hoist for the fuel handling machine (FHM) is wedged between a section of the fallen roof and the FHM. It is currently in a stable position, but there is a risk that it might fall as rubble is removed.
- If it were to fall on top of the existing spent fuel pool (SFP) gate cover ※¹, the SFP gate may incur damage, therefore additional countermeasures are being implemented.

※¹ Installed in March 2020 to reduce the risk of the SFP gate being knocked out of place or damaged by small pieces of falling rubble, or falling roof frames.

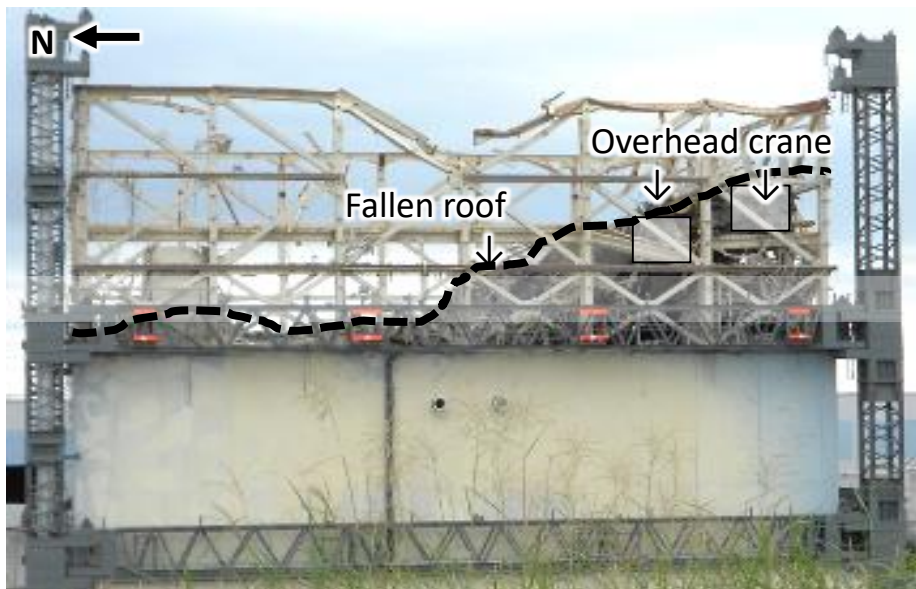


Photo of Unit 1 from the west (rubble conditions)

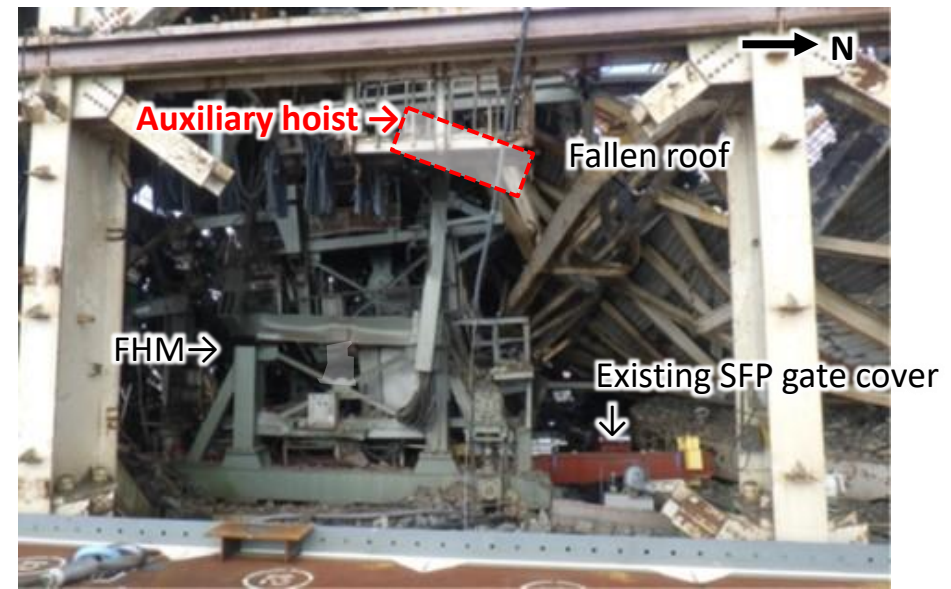


Photo of the Unit 1 operating floor from the east

4-2. FHM auxiliary hoist status

- The rubble on top of the auxiliary hoist is layered such that the rubble on the top pushes down on the rubble below thereby holding the auxiliary hoist in a stable position. No significant change was seen in the position of the auxiliary hoist even after the seismic intensity 6 lower (max. seismic intensity felt in Okuma Town and Futaba Town) earthquakes that occurred on February 13, 2021 and March 16, 2022.



Prior to earthquake (January 21, 2021)



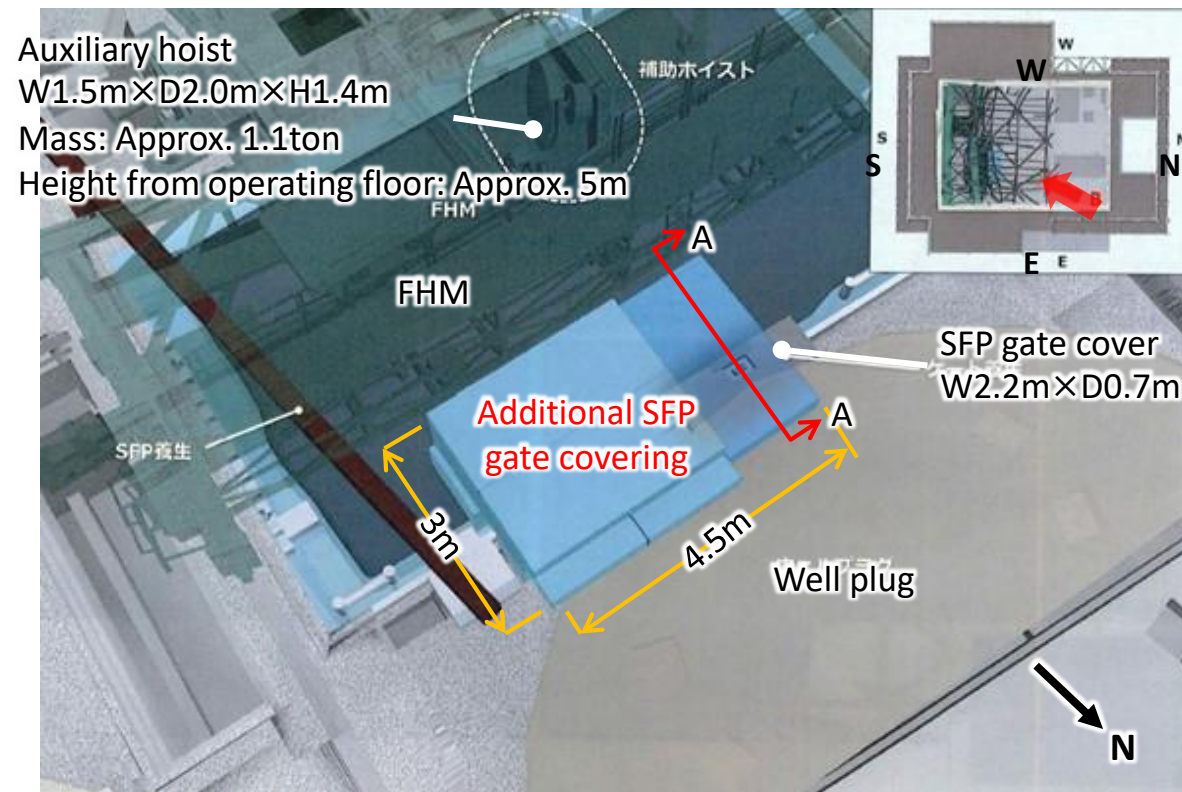
After Feb. 13 earthquake (February 15, 2021)



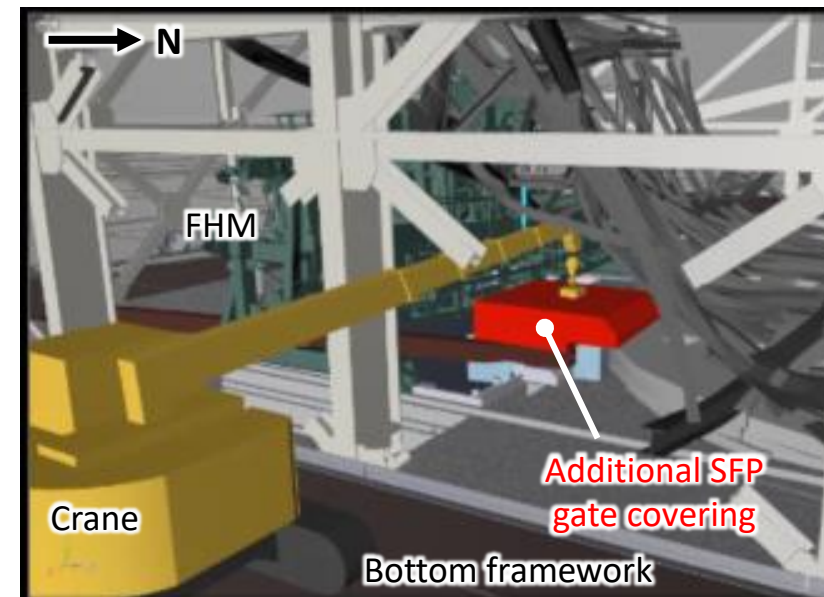
After Mar. 16 earthquake (September 6, 2022)

4-3. Additional SFP gate covering plan

- Polystyrene foam has been chosen as the main material for the additional SFP gate covering because it is light, can be easily fitted to match the shape of objects/rubble in the field, and can absorb/distribute shock. A crane will be installed on the bottom framework of the large cover and used to place polystyrene foam pieces on top of the existing SFP gate cover.
- Element tests (basic performance tests of the covering material using a drop impact test machine) and mockup tests that simulate the mass of various objects and positional relationships have been used to confirm that even if the auxiliary hoist were to fall on top of the SFP gate cover, no damage would be incurred.
- Since bringing in the additional covering would be difficult after installation of the large cover box ring, we plan to put the additional SFP gate covering in place around April 2025 prior to box ring installation.



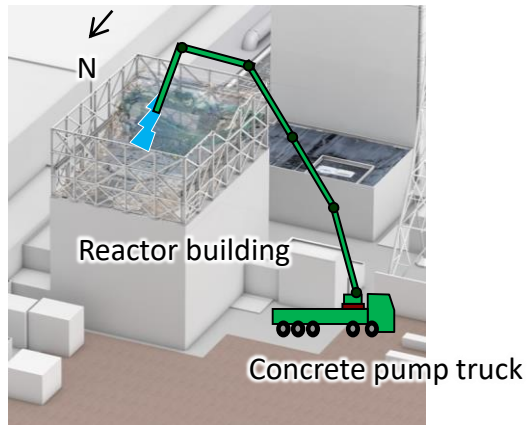
Birds eye view



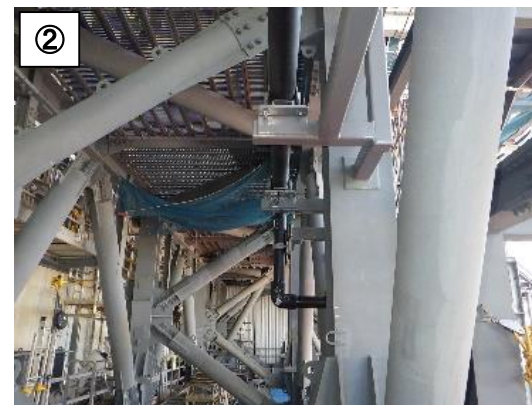
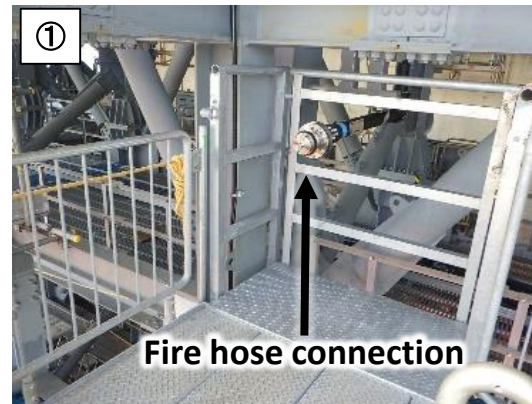
Concept drawing of installation

5. Installation of SFP alternative cooling water injection line

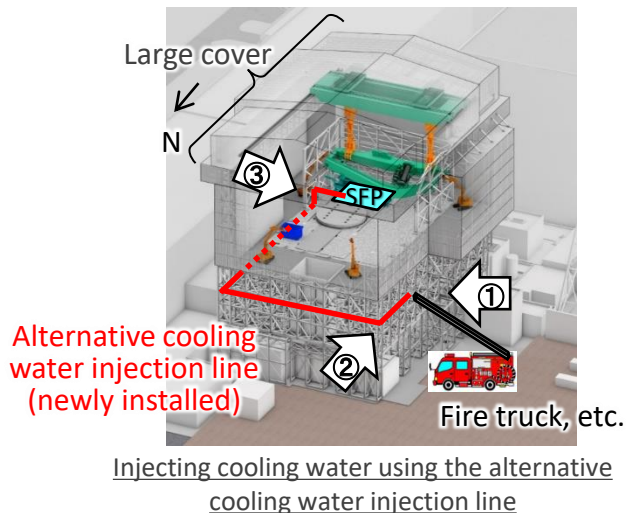
- In conjunction with installation of the upper framework of the large cover, a new means of cooling water injection (alternative cooling water injection line) has been installed since it would be difficult to inject cooling water into the SFP using concrete pump trucks.
- Existing SFP cooling equipment continues to be used for cooling water injection, and the installation of this new line is merely a means for diversifying cooling water injection methods.



Using a concrete pump truck for cooling water injection (prior to large cover installation)



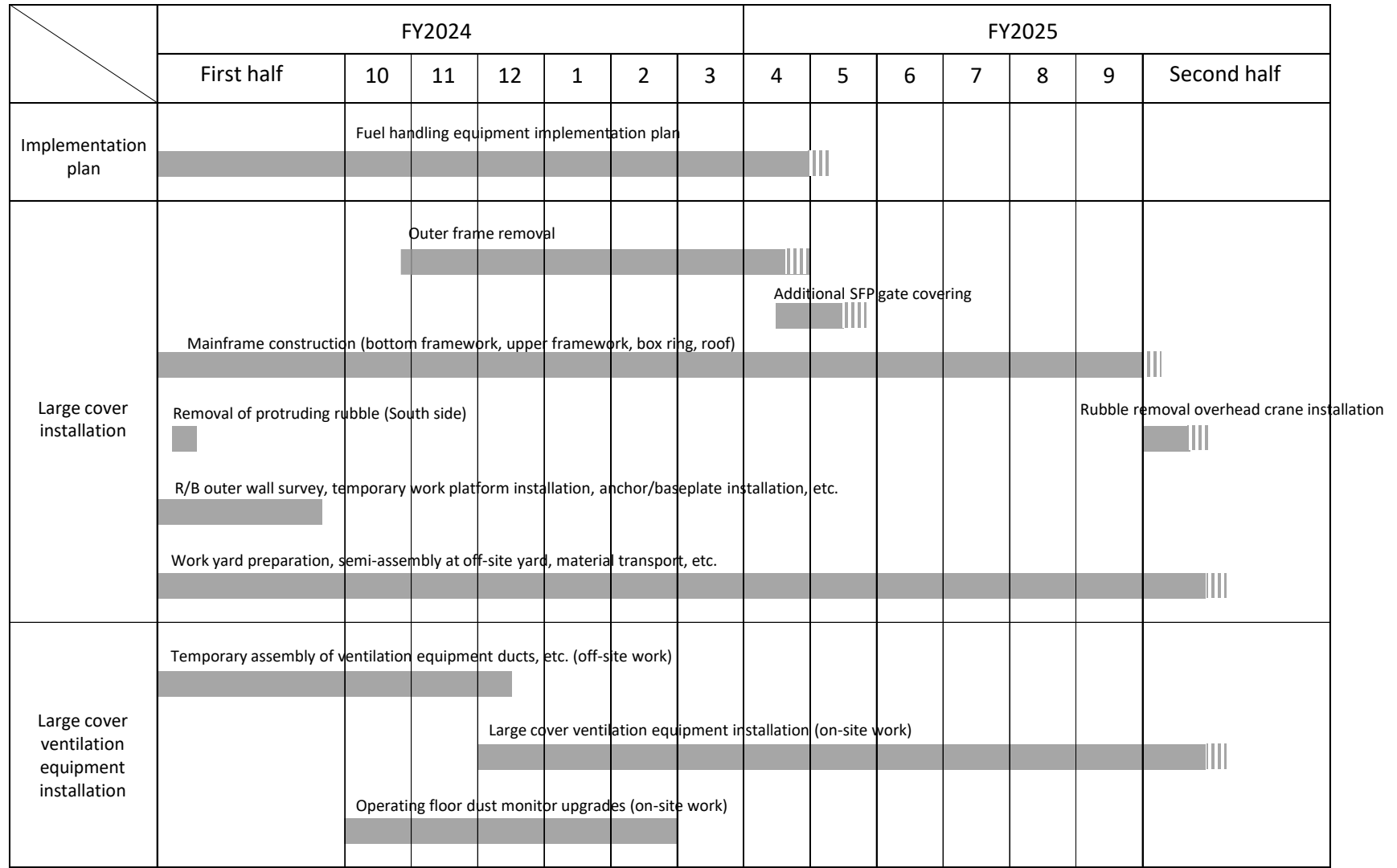
Alternative cooling water injection line installation status (photograph on February 26)



Injecting cooling water using the alternative cooling water injection line

6. Schedule

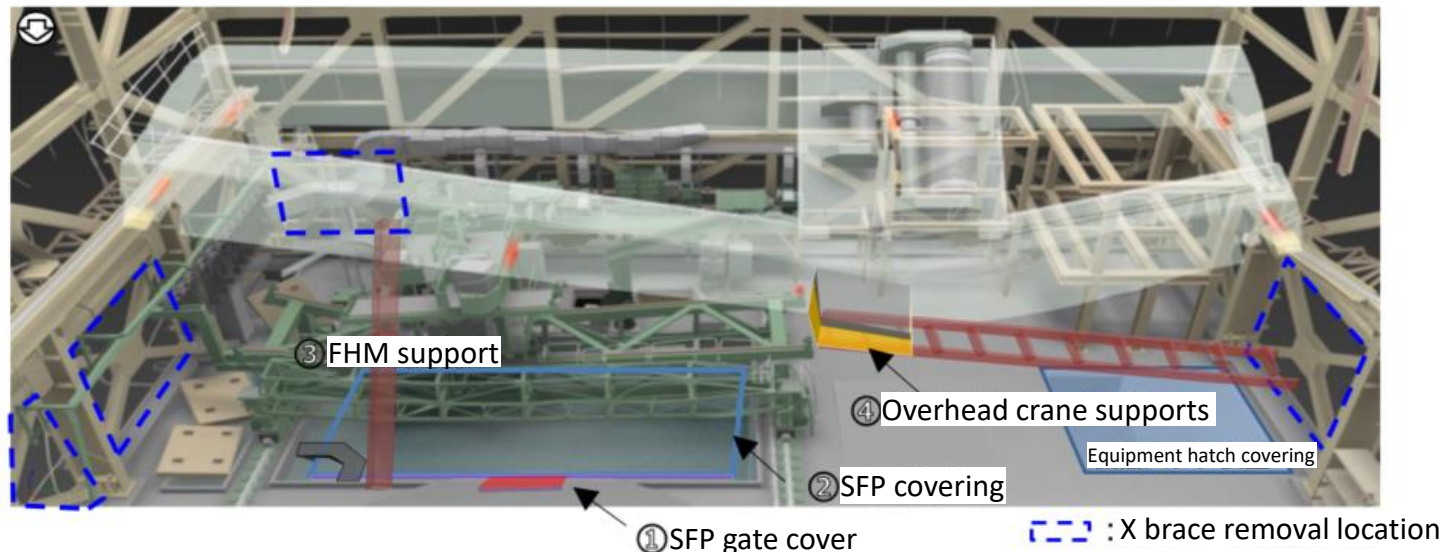
- Semi-assembly of the retractable roof is underway off-site.
- Upper framework installation, outer frame removal, and a large cover ventilation equipment installation is underway on-site.
- Additional covering installation to the SFP gate will be commenced around April 2025 as soon as preparations have been completed.



1-1. Falling rubble prevention/mitigation measures

- The following falling rubble prevention/mitigation measures* were implemented (completed on November 24, 2020) in order to reduce, as much as possible, the risk of roof frames and rubble, etc. falling into the SFP as the portion of the fallen roof on the south side is being removed.

- * ① SFP gate cover (installed in March 2020)
 - Reduces the risk of decreases in water level caused by the SFP gate being knocked out of place or damaged by roof frames/small rubble, etc., falling onto the SFP gate.
- ② SFP covering (installed in June 2020)
 - Reduces the risk of damaging the integrity of fuel, etc. if roof frames/small rubble, etc. were to fall into the SFP.
- ③ FHM supports (installed in October 2020), overhead crane supports (installed in November 2020)
 - Reduces the risk of damaging the integrity of fuel, etc. and the risk of dust dispersion caused by falling of the overhead crane resulting from the overhead crane/FHM being knocked out of place, or imbalances in a hoisted load, caused by roof frames/small rubble, etc. removal.



Falling rubble prevention/mitigation measures overview