Fukushima Daiichi Nuclear Power Station Unit 1
Progress of Fuel Removal from Spent Fuel Pool

July 3, 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.

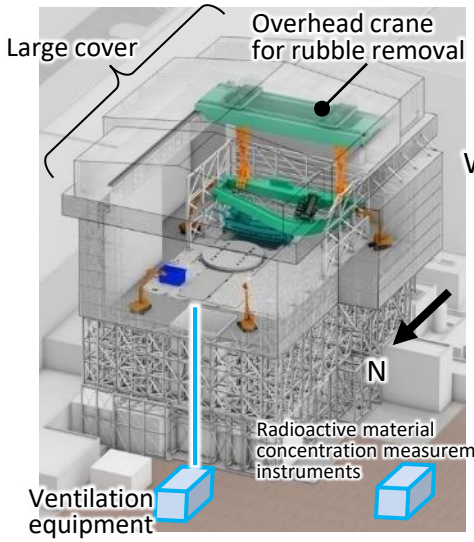
  * 292 spent fuel assemblies and 100 fresh fuel assemblies

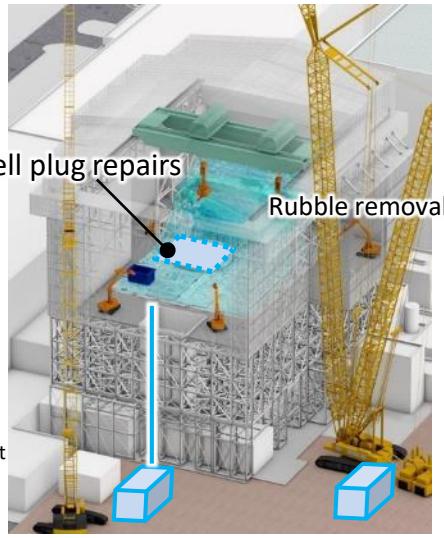
- Prior to fuel removal, a large cover that encompasses the entire reactor building will be built, rubble removed from under the large cover, the operating floor decontaminated/shielded, and fuel handling equipment (fuel handling machine (FHM) and crane) installed.

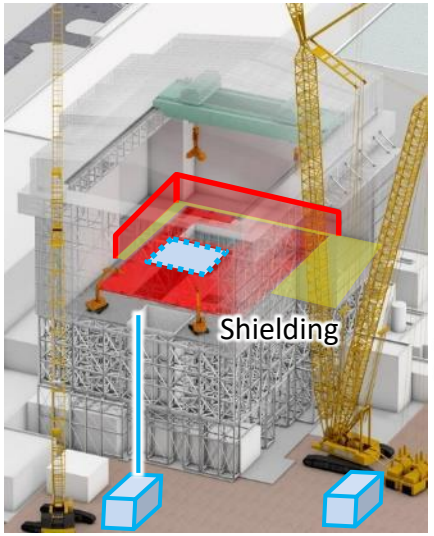
Large cover installation completed

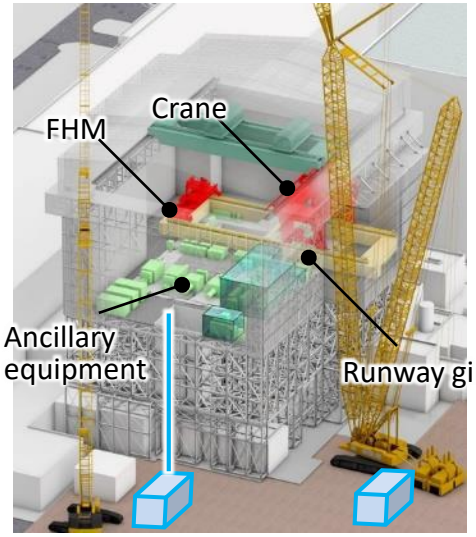
Commencement of fuel removal
(FY2027~2028)

STEP1	STEP2	STEP3	STEP4	STEP5
Install large cover	Rubble removal, etc.	Decontamination/shielding	Fuel handling equipment installation	Fuel removal









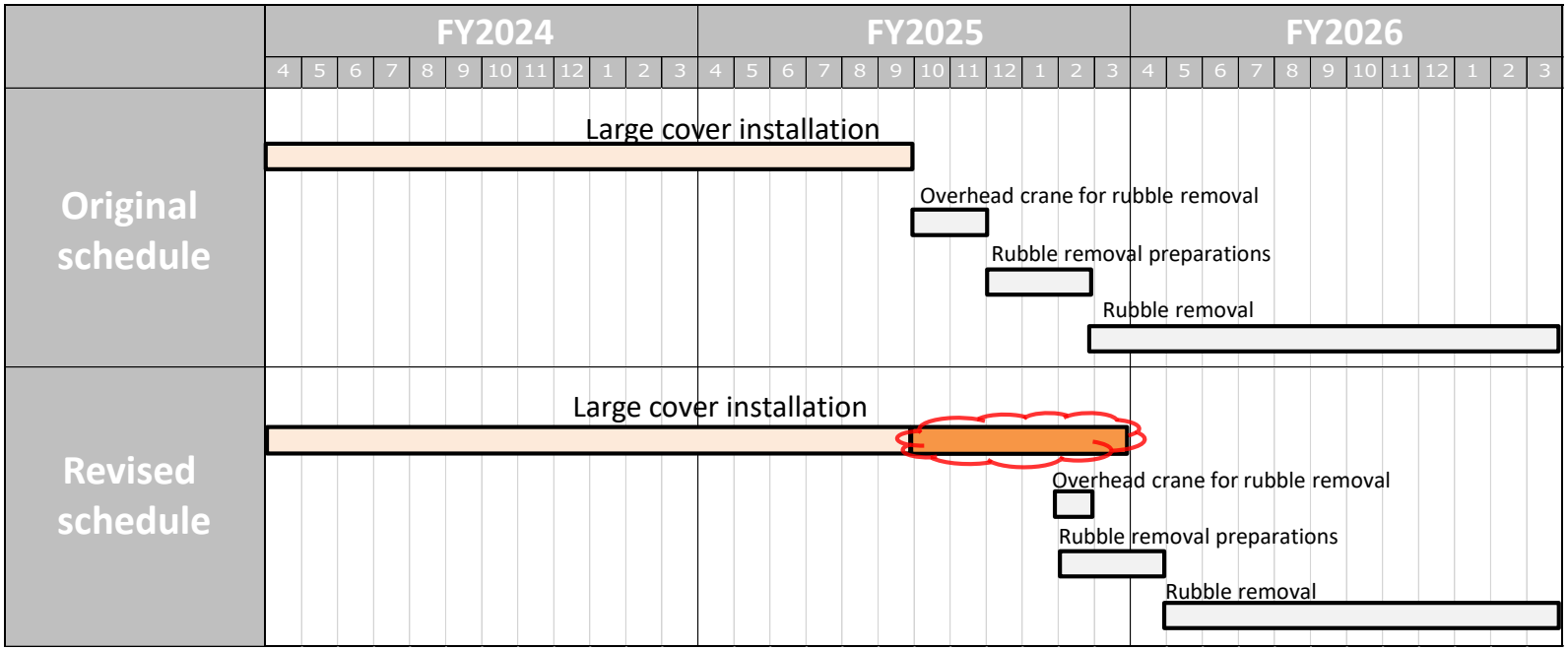
※These are just concept diagrams and actual location may differ

2-1. Revision of large cover installation schedule

- In light of the impact of hotspots discovered on the south side (announced in December 2023) we had been aiming to complete construction of the large cover around the summer of FY2025.
- Now that the bottom framework has been installed and we have been able to assess the impact of radiation from the operating floor in more detail, making it necessary to take measures to reduce radiation exposure* so as to proceed in a safer manner.Work suspensions caused by bad weather, interference with other tasks, and equipment malfunctions, etc., have caused delays in the schedule, and we may see similar delays in the future.

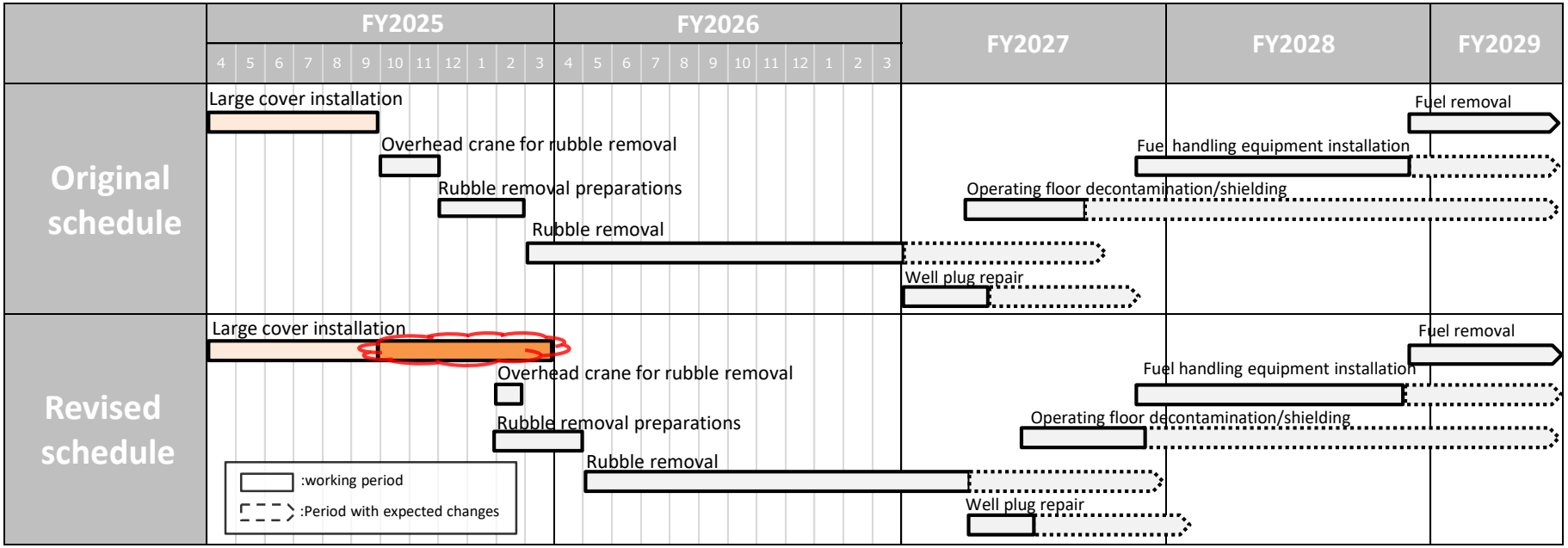
*Installing additional exposure reduction shielding and revising work times

- These circumstances and the need to anticipate shortened work hours due to extreme heat in summer, we have revised the schedule as follows. The expected date of completion of the large cover installation has been changed from the summer of FY2025 to the end of FY2025.



2-2. Impact on the commencement of fuel removal

- In conjunction with the delay in the expected completion of the large cover, we expect that tasks to be performed thereafter will also be pushed back. However, it will be possible to shorten the work process after the rubble removal by reviewing the work procedures, therefore, at this point in time, we are not revising the expected commencement date of fuel removal (FY2027~FY2028)
- Furthermore, there remains a certain amount of uncertainty in regards to rubble removal to be performed after completion of the large cover because we have not been able to totally ascertain rubble conditions, so we will decide whether or not the entire schedule needs to be revised when we are about halfway through rubble removal.



3-1. Large cover installation status (off-site)

- Semi-assembly of the retractable roof and the overhead crane for rubble removal is underway.
  - Retractable roof ： 5 out of 8 blocks completed
  - Overhead crane for rubble removal： 2 out of 4 blocks completed

Present

Temporary work platform (Completed) → Bottom framework (Completed) → Upper framework (Completed) → Box ring (Completed) → Retractable roof (Approx. 62%) → Overhead crane for rubble removal (50%)

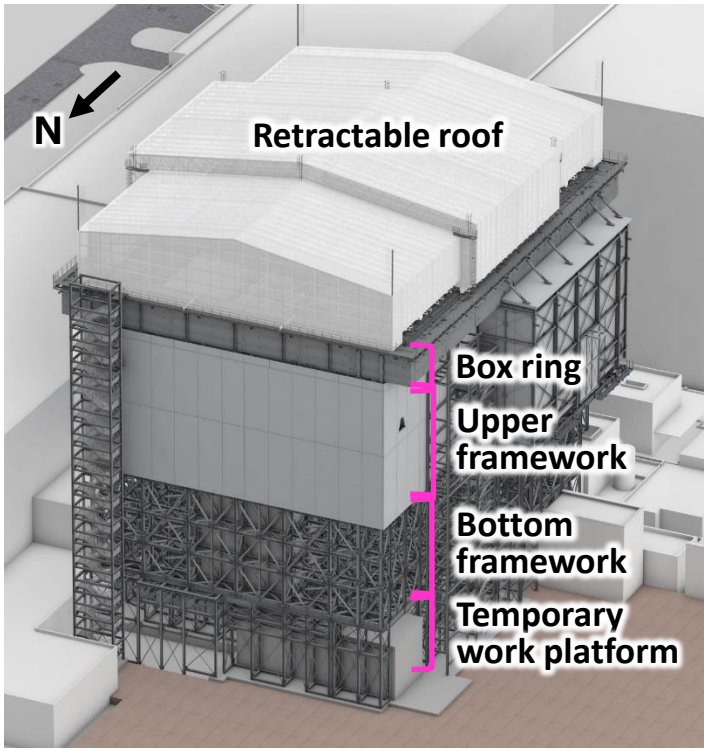
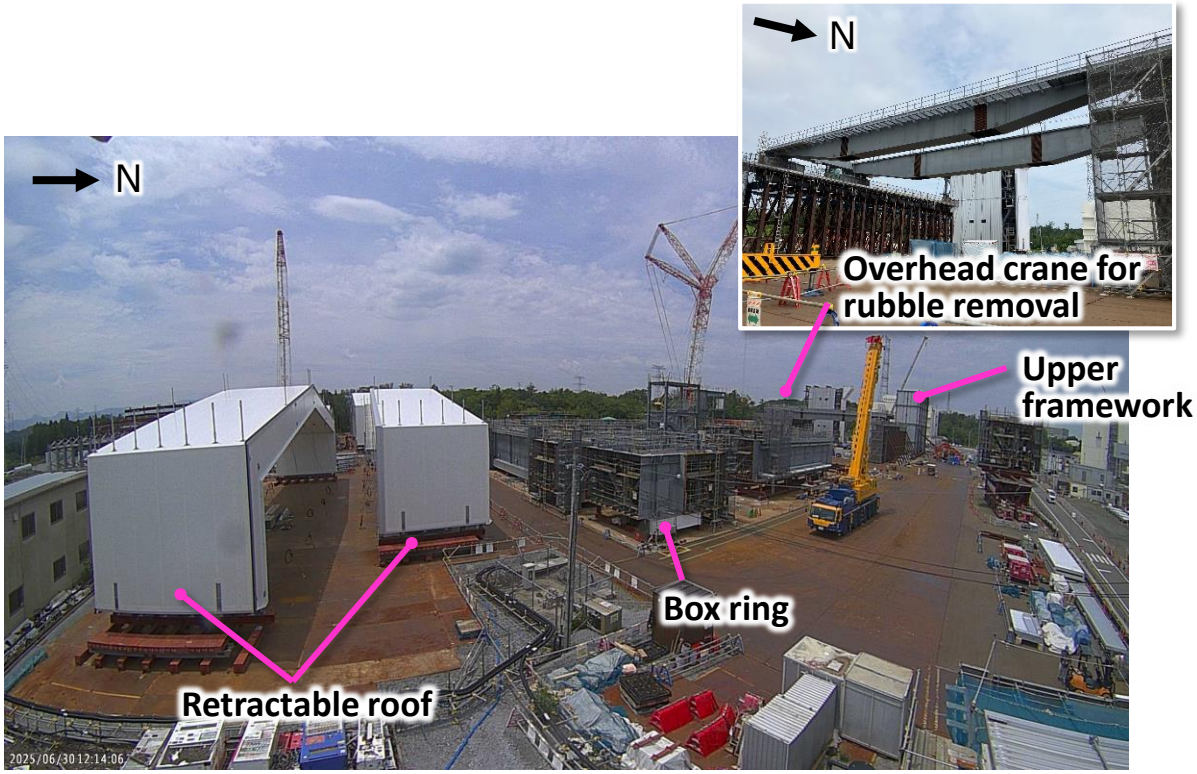


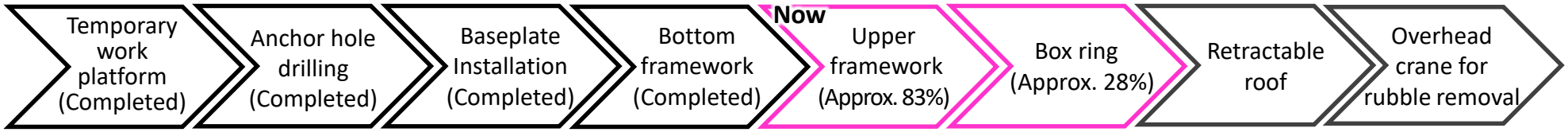
Diagram of the entire large cover

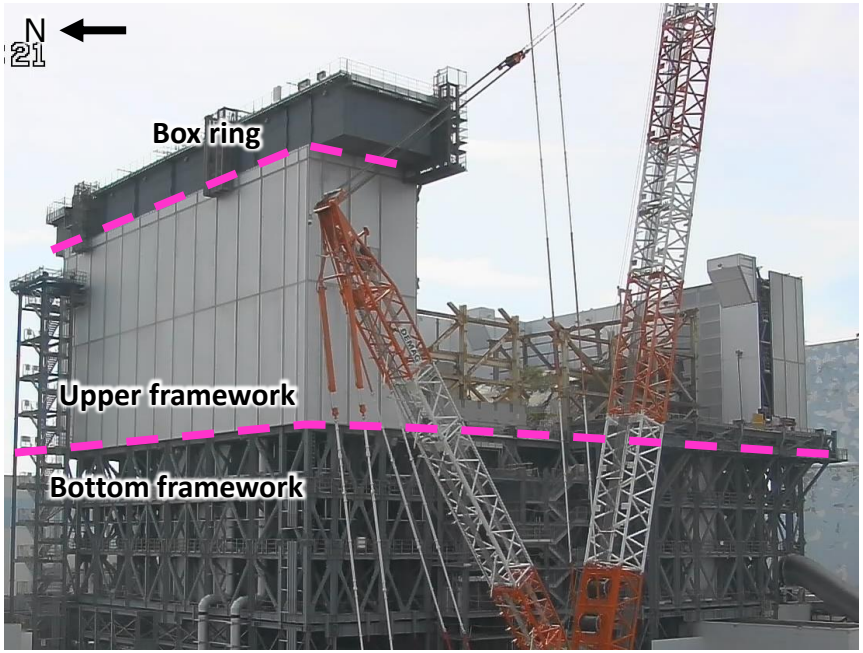


Off-site yard (photographed on June 30, 2025)

3-2. Large cover installation status (on-site)

- Installations of the upper framework and the box ring are underway.
  - Box ring : 4 out of 14 blocks completed
  - Upper framework : 10 out of 12 blocks completed



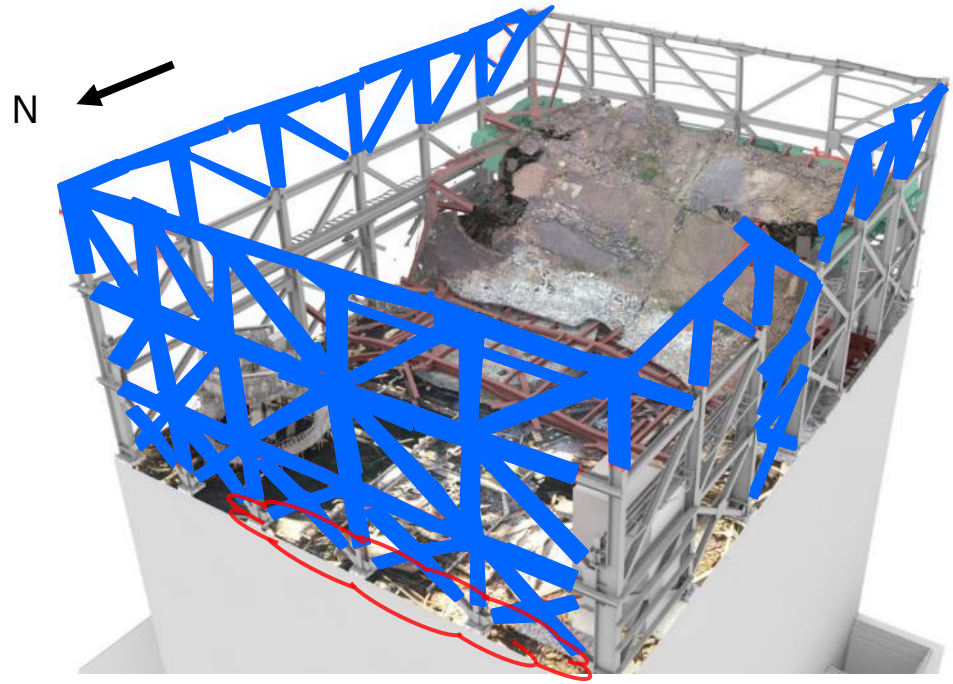


On-site conditions (Northwest side)
(Photographed on June 30, 2025)

On-site conditions (Southeast side)
(Photographed on June 30, 2025)

4. Removal of outer frame

- Portions of the outer frame, the blue part were removed in order to reduce the risk of contact with the large cover and to improve seismic resistance on May 22, 2025. Processing of the outer frame ends at the bottom of the north side is underway.



Portions that have already been removed (completed on May 22, 2025)

Scope of processing range of the outer frame ends

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

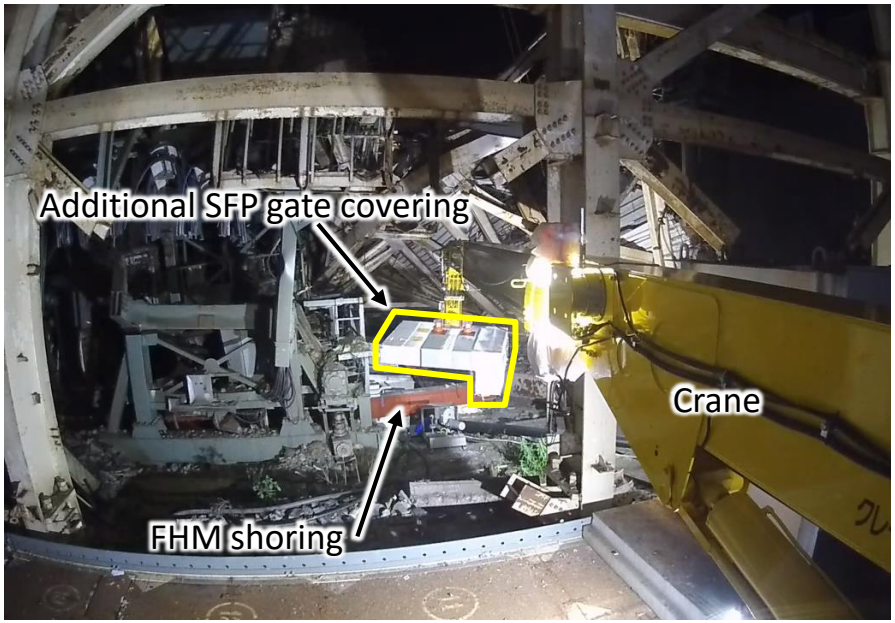
Entire structure before removal (photographed on August 14, 2024)

Entire structure after removal (photographed on May 23, 2025)

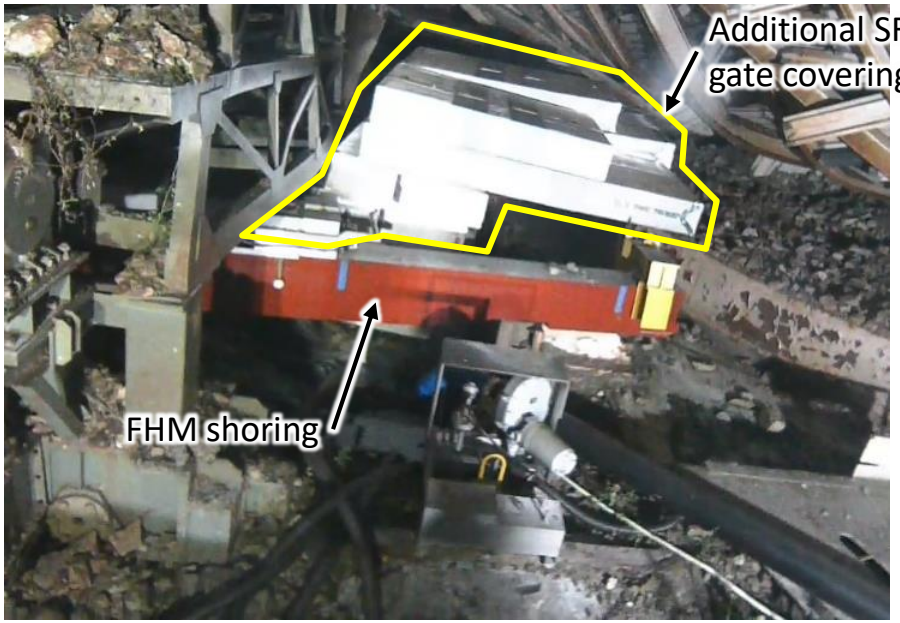
5. Installation of an additional cover over the Unit 1 spent fuel pool gate

- Installation of an additional cover* over the spent fuel pool gate (SFP gate) was completed on June 27, 2025.
- The cover was installed using an 8-ton crane placed on the bottom framework of the large cover.

* Covering as a countermeasure to protect the SFP gate from being damaged if the auxiliary hoist for the FHM falls (announced on March 27, 2025)



Installing an additional cover
(photographed on June 27, 2025)



Installed an additional caver
(photographed on June 27, 2025)

6. Schedule

- Semi-assembly of the retractable roof and the overhead crane for rubble removal is underway off-side.
- Installations of the upper framework, the box ring and large cover ventilation equipment are underway on-site.

	FY2025												FY2026						
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	Second half
Implementation plan	Fuel handling equipment implementation plan																		
Large cover installation	Outer frame removal										Rubble removal preparations			Rubble removal					
			Additional SFP gate covering																
	Mainframe construction (bottom framework, upper framework, box ring, retractable roof)																		
										Rubble removal overhead crane installation									
	Work yard preparation, semi-assembly at off-site yard, material transport, etc.																		
Large cover ventilation equipment installation	Large cover ventilation equipment installation (on-site work)																		

[Reference] 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.

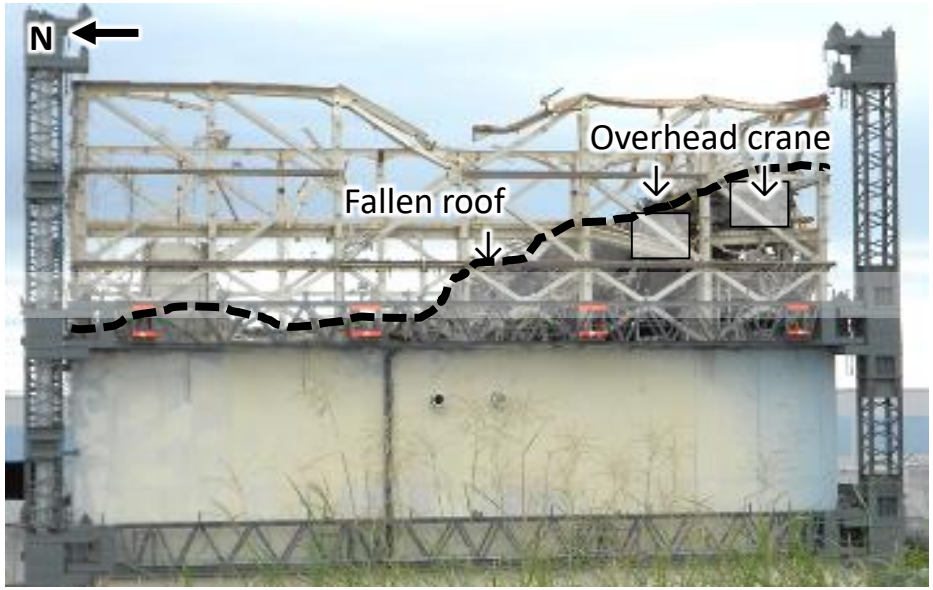


Photo of Unit 1 from the west (rubble conditions)

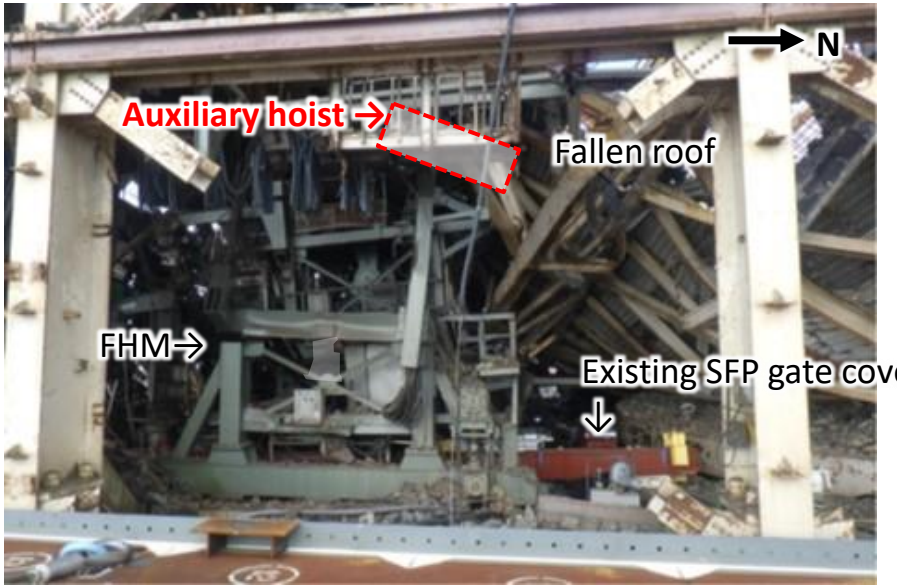


Photo of the Unit 1 operating floor from the east

[Reference] 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.

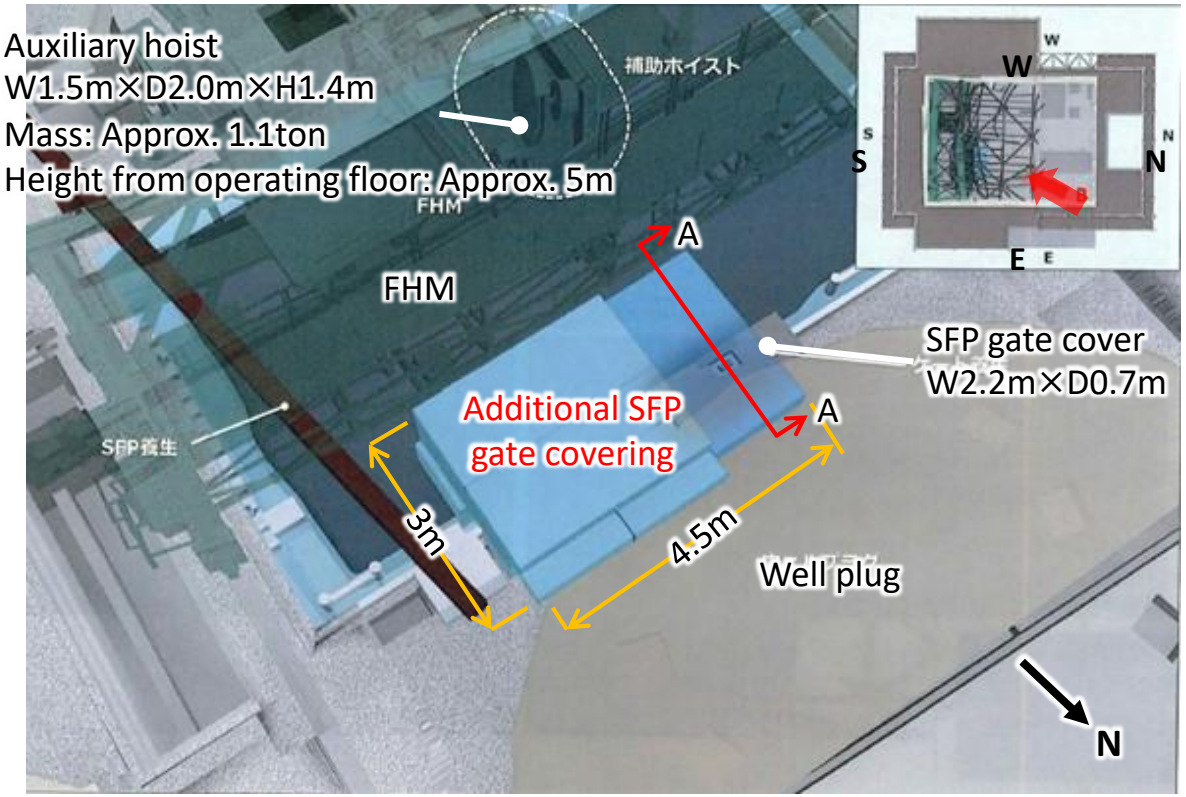
Prior to earthquake (January 21, 2021)

After Feb. 13 earthquake (February 15, 2021)

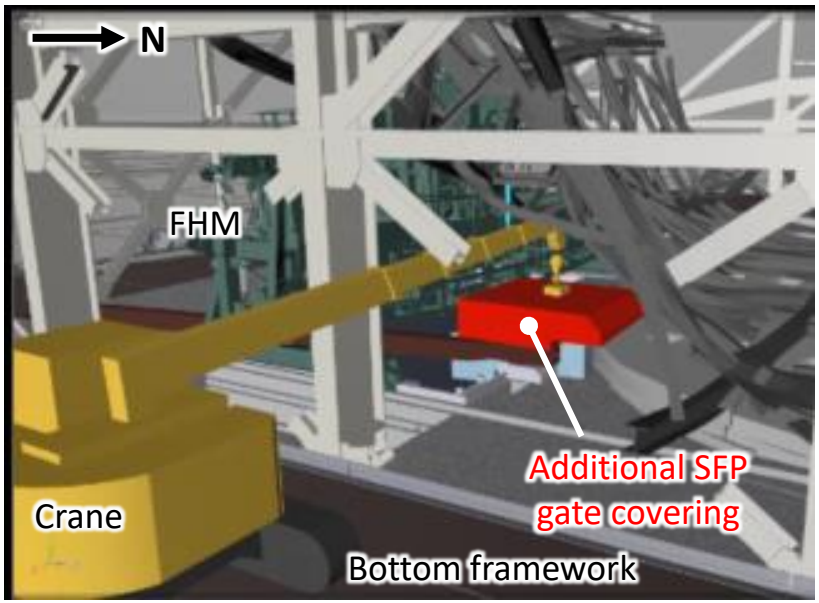
After Mar. 16 earthquake (September 6, 2022)

[Reference] 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