Improvements in the Surroundings of ALPS Treated Water Dilution/Discharge Facilities at the Fukushima Daiichi Nuclear Power Station

＜Reference Material＞
July 11, 2022
Tokyo Electric Power Company Holdings, Inc.
Fukushima Daiichi D&D Engineering Company

- In land improvements in the surroundings near the Units 5/6 intake, the establishment of the seabed tunnel and installation of the soil retention for the vertical shaft (down-stream storage) necessary for discharge began on December 4, 2021, and excavation for the vertical shaft (down-stream storage) was completed on march 4.
- The shield machine to be used for the construction of the discharge tunnel was transported by sea to the power station on April 24 and has been stored inside the vertical shaft (down-stream storage) since April 25.
- Soil retention and excavation for the vertical shaft (upper-stream storage) has been underway since June 2 and will continue as part of environment improvements.
- Meanwhile, seafloor excavation in preparation for installation of the discharge outlet caisson※, which is being done as part of offshore improvements, commenced on May 5 when weather/ocean conditions permitted, and seafloor excavation was completed on June 27.

※ Concrete box structures used for foundation and harbor construction

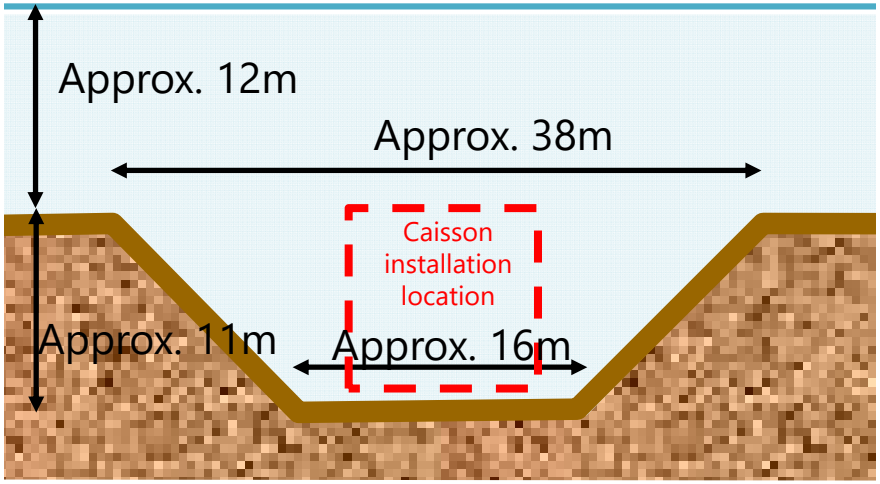
＜ Announced by June 30 ＞

- As part of offshore environment improvements, on July 3 a crane ship was used to deposit riprap onto the seafloor in order to cover the surface of the area that has been excavated. After that, work began to spread out the riprap on the seabed on July 4.
- Manufacturing of discharge outlet caisson began off-site on March 14 and was completed on July 8. As soon as preparations have been completed they will be shipped by sea to Onahama Port.
- As part of land improvements, in order to prioritize safety during tunnel construction, a survey will commence after July 12, as soon as preparations have been completed, to check for spring water coming from groundwater, at the retention wall where excavation with the shield machine will commence. Furthermore, after this survey has been completed, the shield machine will be relocated close to the retention wall to complete improvements in the surroundings for the discharge of vertical shaft (down-stream storage).

1．Progress status of improvements in the surroundings (offshore) (1)

- After seafloor excavation, depth measurements were taken on June 28 to ensure that the width and depth (approximately 11 m) required for caisson installation had been reached.

- Off-site manufacturing of the discharge outlet caisson was completed on July 8. As soon as preparations have completed, they will be shipped by sea to Onahama Port.



Installation location of discharge outlet caisson on the seafloor

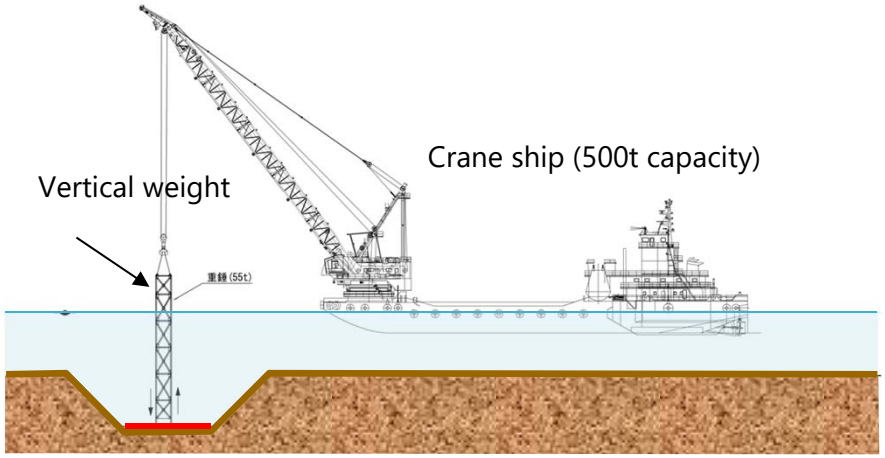
Discharge outlet caisson

1． Progress status of improvements in the surroundings (offshore) (2)

- On July 3, a crane ship (500t capacity) was used to deposit approximately 600m^3 of riprap (30 ~200 kg/bag, Specific weight: 2.5+) in order to cover the surface of the seafloor that has been excavated.
- Work to spread out the riprap on the seafloor commenced on July 4.

- A vertical weight (55t) attached to the crane ship will be used to spread out the foundation riprap evenly (coverage area: approximately 300m^2), as final preparations for the installation of discharge outlet caisson.

Riprap depositing/covering

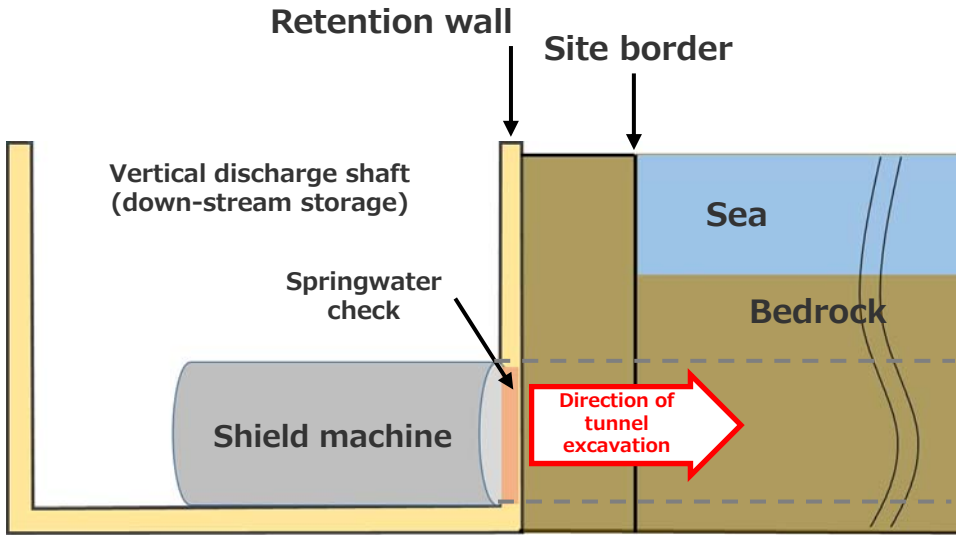


Concept diagram of how a crane ship (500t capacity) is being used to spread out the foundation riprap

2． Future works for improvements in the surroundings (land)

- As part of land improvements, a shield machine was lowered into the vertical discharge shaft (down-stream storage) on April 25, and has been stored inside the vertical discharge shaft (down-stream storage).
- In order to prioritize safety during tunnel construction, a survey will commence after July 12, as soon as preparations have been completed, to check for spring water coming from groundwater at the retention wall where in the direction of a shield machine will be boring. Furthermore, after this survey has been completed, the shield machine will be relocated close to the retention wall to complete improvements in the surroundings for the discharge of vertical shaft (down-stream storage). (Bottom right diagram: Location of shield machine in front of the retention wall)

Shield machine storage



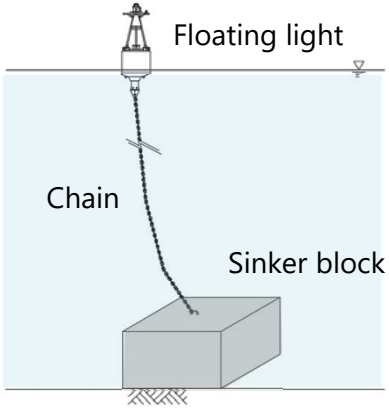
Completion of shield machine excavation preparations (concept diagram)

【Reference】 Overview of improvements in the surroundings (offshore)

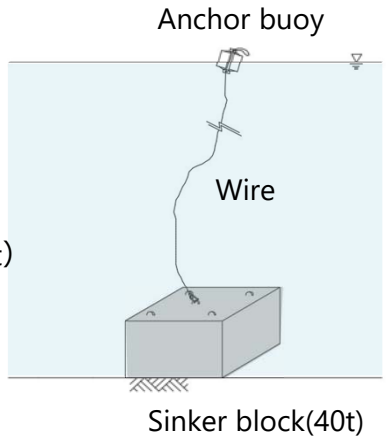
Decommissioning/Contaminated Water/Treated Water Countermeasure Team Meeting/Secretariat meeting (101st) (document excerpt April 27, 2022)

①Floating lights/sinker block installation

- A crane ship will be used to position four floating lights attached to four sinker blocks (25t) in order to demarcate the offshore construction area.
- Sinker blocks used to moor ships will be positioned by a crane ship outside (four 110t blocks) and inside the harbor (three 25t and 40t blocks).



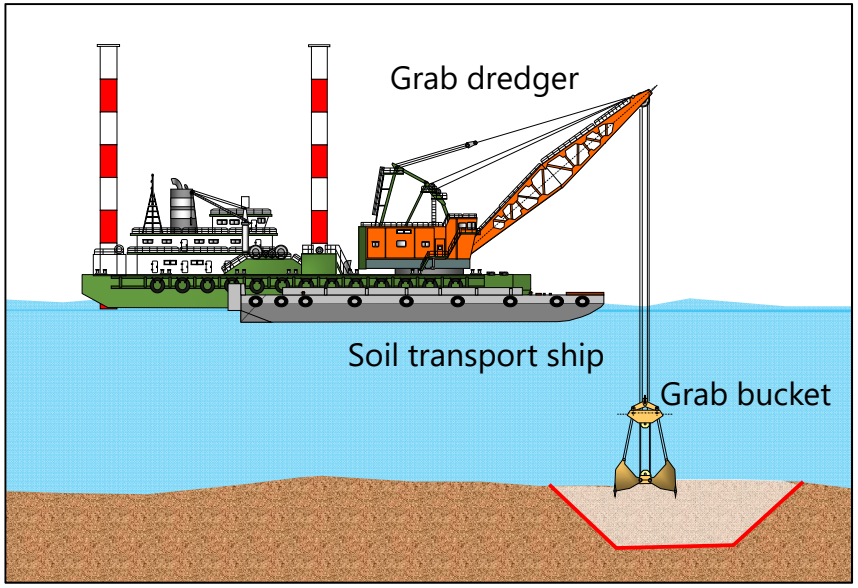
Floating light installation (concept diagram)



Ship mooring sinker block installation (concept diagram)

②Seafloor excavation/Riprap lining construction

- The seafloor will be excavated using a grab dredger in order to construct the discharge outlet caisson.
- Excavated seafloor soil shall be shipped to the power station unloading wharf inside the harbor, gathered, and brought on-site to the soil disposal yard.
- The crane ship will deposit riprap onto the seafloor in order to cover the surface of the area that has been excavated.



Seafloor excavation using a grab dredger (concept diagram)

【Reference】 Progress status of improvements in the surroundings (offshore)

Decommissioning/Contaminated Water/Treated Water Countermeasure Team Meeting/Secretariat meeting (103rd) (document excerpt June 30, 2022)

- Seafloor excavation commenced on May 5 approximately 1km offshore from the power station and was completed on June 27.

Seafloor excavation (offshore)

Depth measurements (offshore)

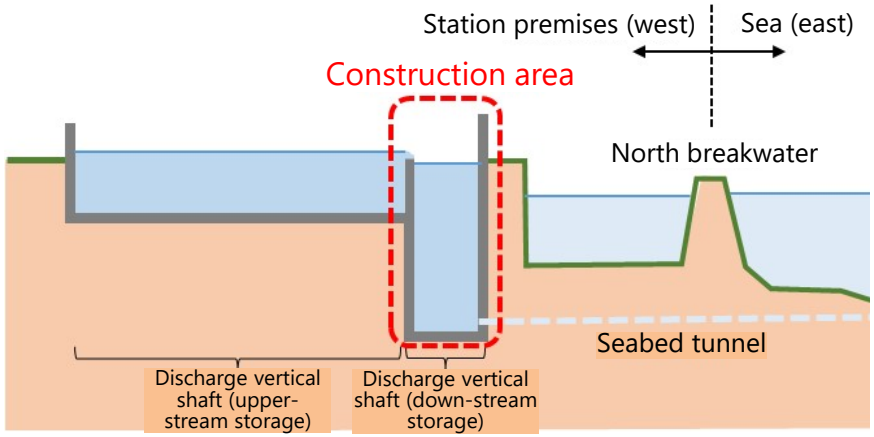
- At current time, we've seen no significant increase in the concentration of cesium in sampled seawater taken during seafloor excavation, nor any remarkable seawater turbidity.

Seawater sampling

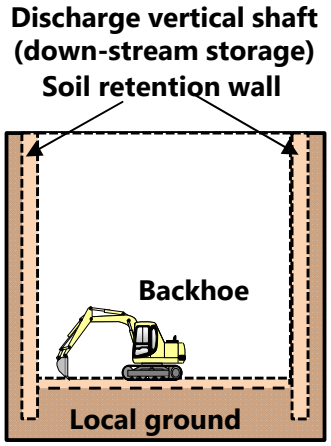
Turbidity measurements

【Reference】 Progress status of improvements in the surroundings (land)

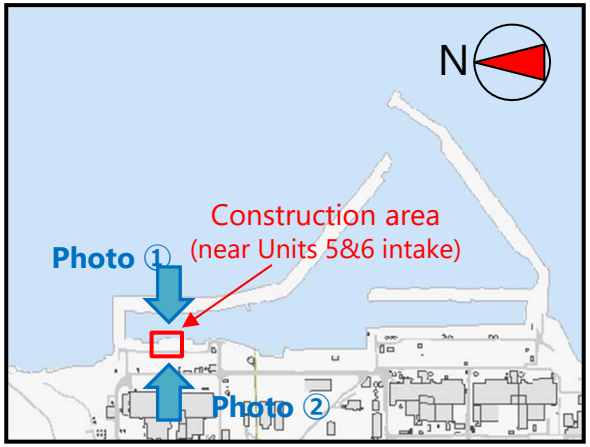
Decommissioning/Contaminated Water/Treated Water Countermeasure Team Meeting/Secretariat meeting (100th) (document excerpt March 31, 2022)



Cross-section view of construction area



Construction image



Location of construction area

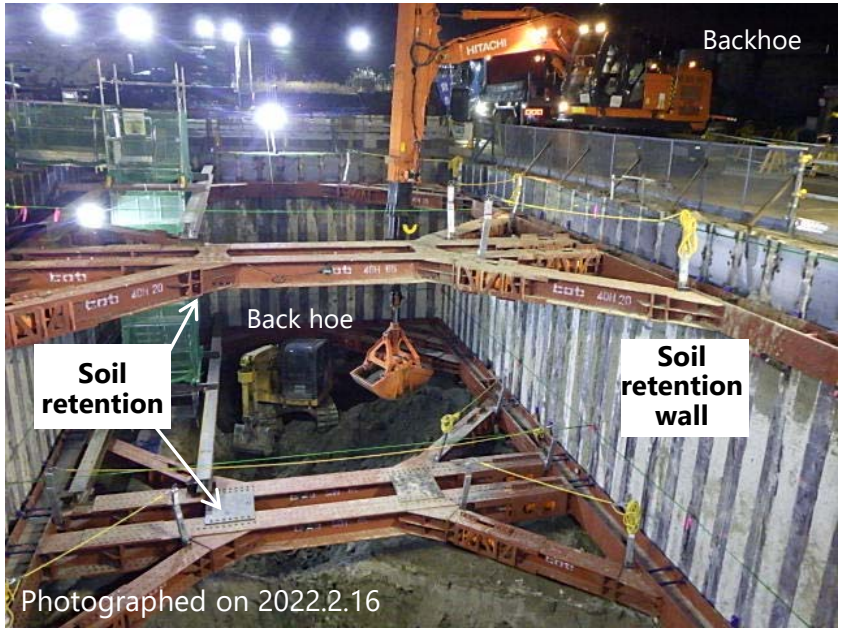


Photo ① Excavation of the vertical shaft

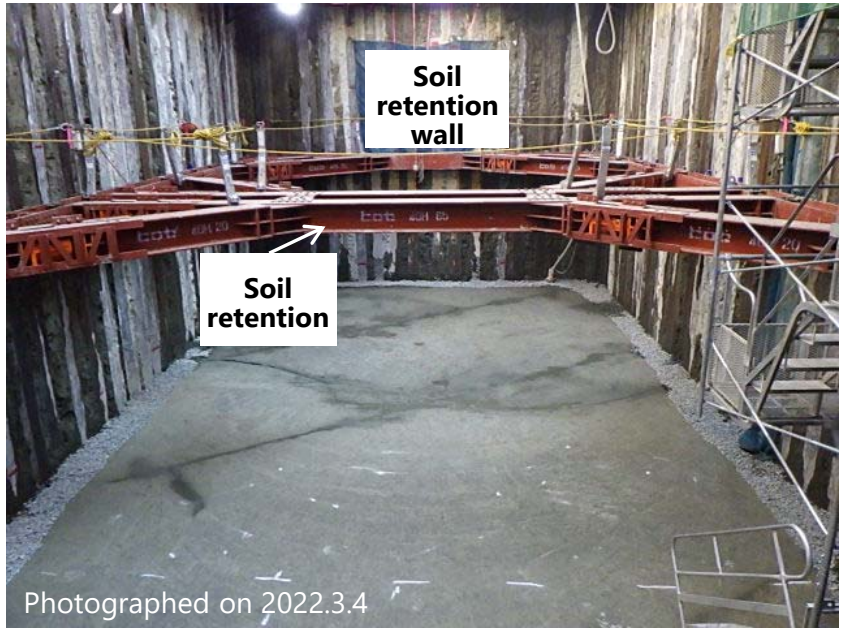
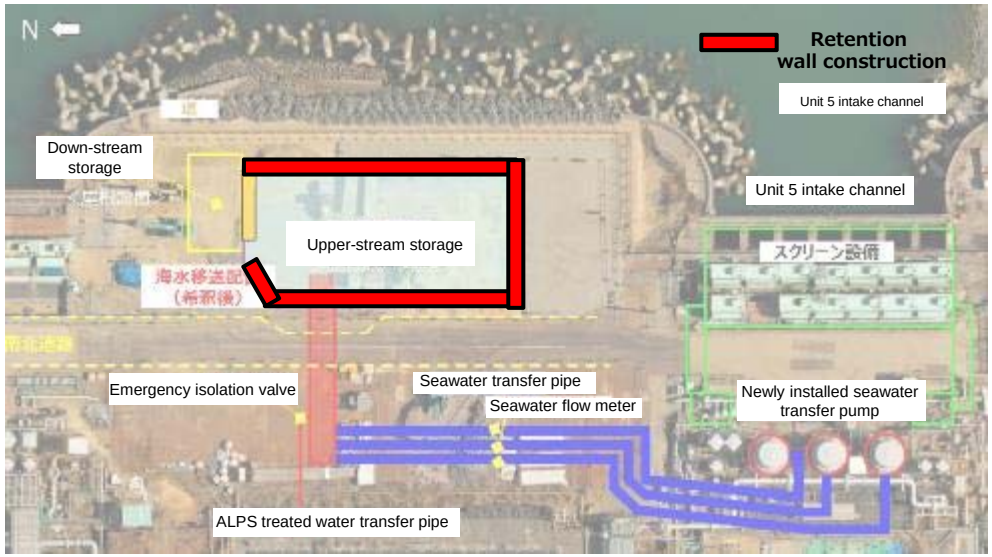


Photo ② Excavation of the vertical shaft completed

【Reference】 Progress status of improvements in the surroundings (land)

Decommissioning/Contaminated Water/Treated Water Countermeasure Team Meeting/Secretariat meeting (103rd) (document excerpt June 30, 2022)

■ Retention wall construction for the vertical discharge shaft (upper-stream storage) began on June 2, 2022



Scope of retention wall construction

Retention wall construction