Material 2

Briefing for the Nuclear Reform Monitoring Committee September 15, 2022

Progress of Decommissioning at the Fukushima Daiichi Nuclear Power Station

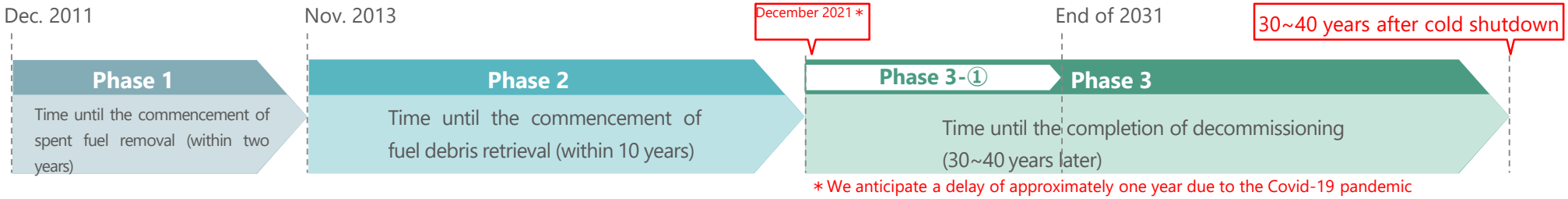
TEPCO

1. **Decommissioning progress**
2. **Progress with the handling of ALPS treated water**

Fukushima Daiichi Decontamination &
Decommissioning Engineering Company

1. DECOMMISSIONING PROGRESS

Mid/Long-Term Roadmap



＊We anticipate a delay of approximately one year due to the Covid-19 pandemic

Phase 3-① will last until the end of 2031 and has been positioned as the, "time during which multiple schedules are carried out in a planned manner in order to commence more full-scale decommissioning."

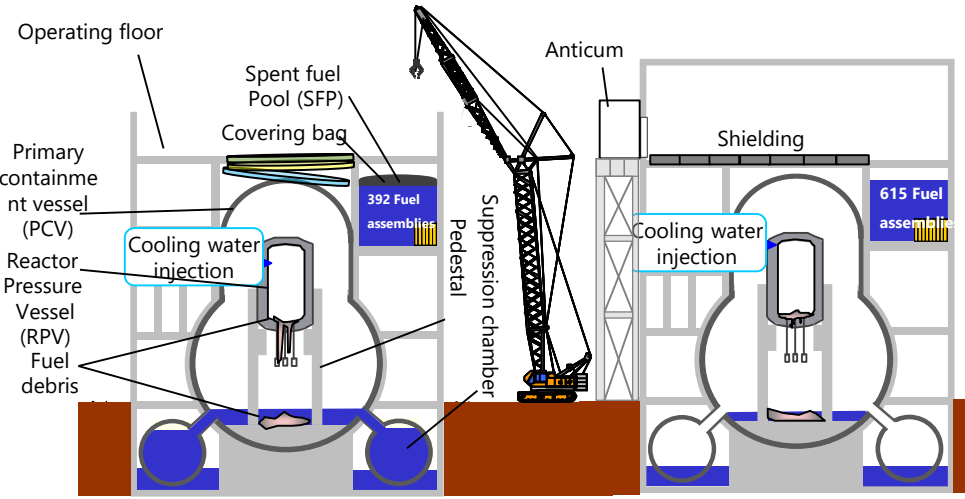
<Primary Schedule Objectives>

Area	Details		Period
Contaminated water countermeasures	Amount of contaminated water generated	Reduce to approximately 150m³/day	During 2020 Achieved
		Reduce to under 100m³/day	During 2025
	Accumulated water treatment	Complete the treatment of accumulated water in building＊	During 2020 Achieved
		Reduce the amount of accumulated water in the reactor buildings by half by the end of 2020	FY2022~FY2024
Fuel removal from the spent fuel pools	Complete fuel removal from Units 1~6		During 2031
	Complete Unit 1 large cover installation		Around FY2023
	Commence fuel removal from Unit 1		FY2027~FY2028
	Commence fuel removal from Unit 2		FY2024~FY2026
Fuel debris retrieval	Commence fuel debris retrieval from the first unit (fuel debris retrieval will start at Unit 2 and the scale gradually enlarged)		During 2021
Waste countermeasures	Technical forecast for treatment/disposal measures and the safety of such measures		Around FY2021
	Eliminate the temporary outdoor storage of rubble		During FY2028

＊:Excluding the Units 1~3 reactor buildings, process main building, and high temperature incinerator building

Current conditions at Units 1~4

Unit 1



Construction on a large cover began in September 2021 in preparation for the removal of fuel from the spent fuel pool after dismantling of the remaining portion of the building cover.

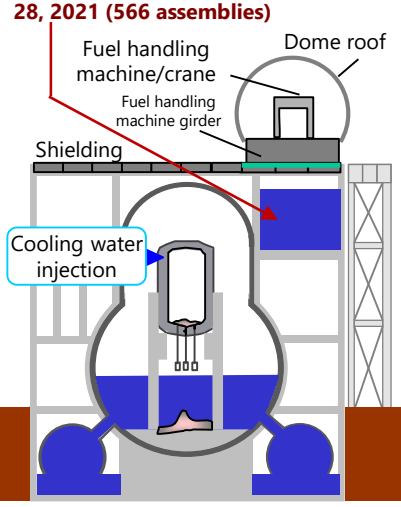
Internal investigations of the primary containment vessel are being conducted in preparation for fuel debris retrieval.

Unit 2

A fuel removal platform anticum will be constructed on the south side of the reactor building in preparation for spent fuel removal. Preparations are also underway to commence fuel debris retrieval as this will be the first unit from which fuel debris will be retrieved.

Unit 3

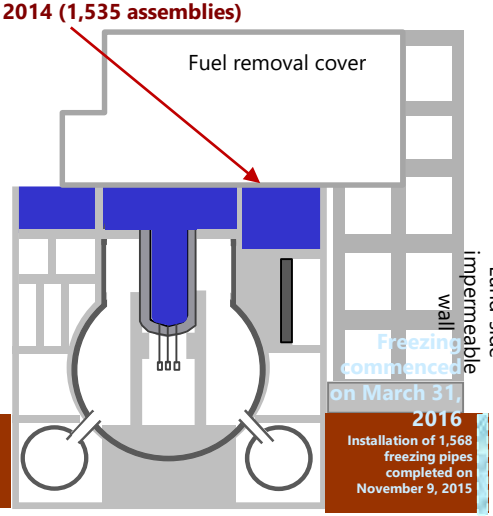
Fuel removal completed on February 28, 2021 (566 assemblies)



Removal of the fuel from the spent fuel pool (566 assemblies) was completed on February 28, 2021. The necessity to conduct additional internal investigations of the primary containment vessel is being deliberated in preparation for fuel debris retrieval.

Unit 4

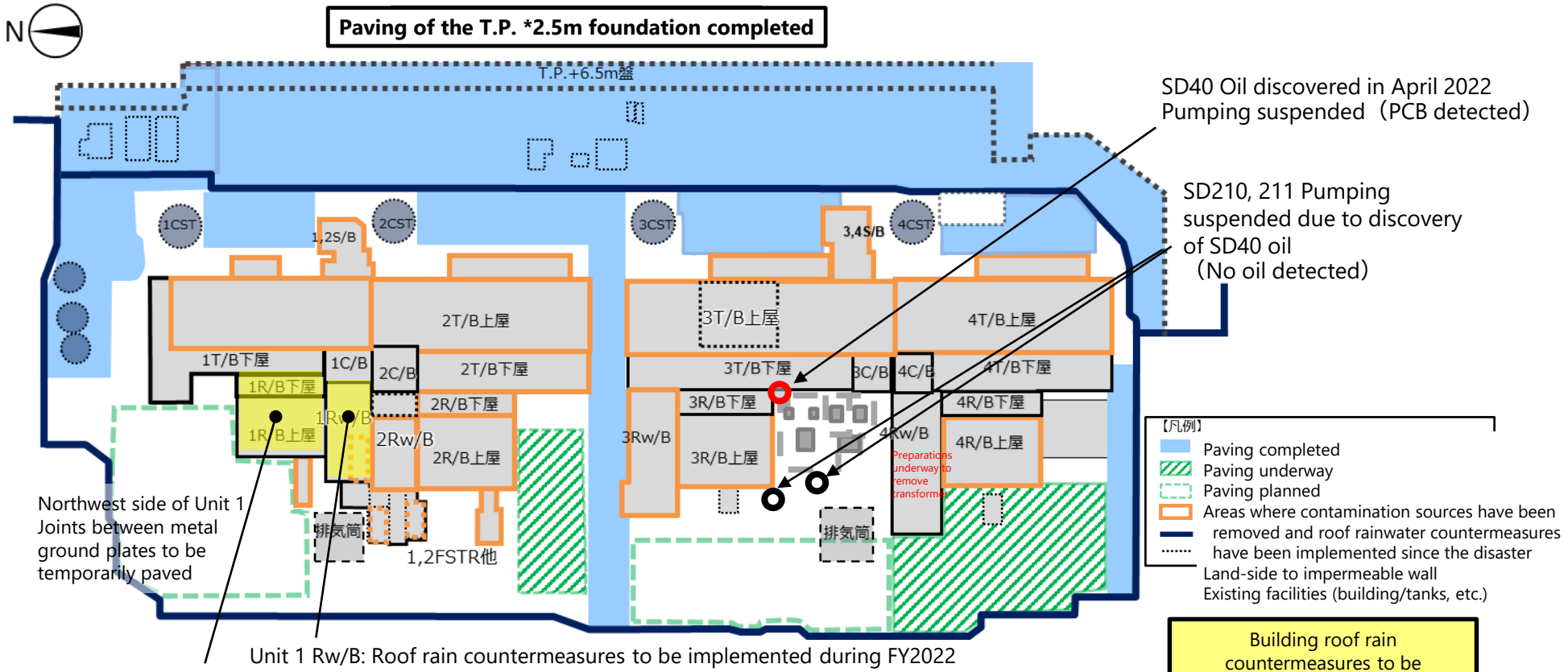
Fuel removal completed on December 22, 2014 (1,535 assemblies)



Removal of the fuel from the spent fuel pool (1,535 assemblies) was completed on December 22, 2014 thereby eliminating risks associated with fuel.

Contaminated water countermeasures: Measures for reducing the influx of rainwater

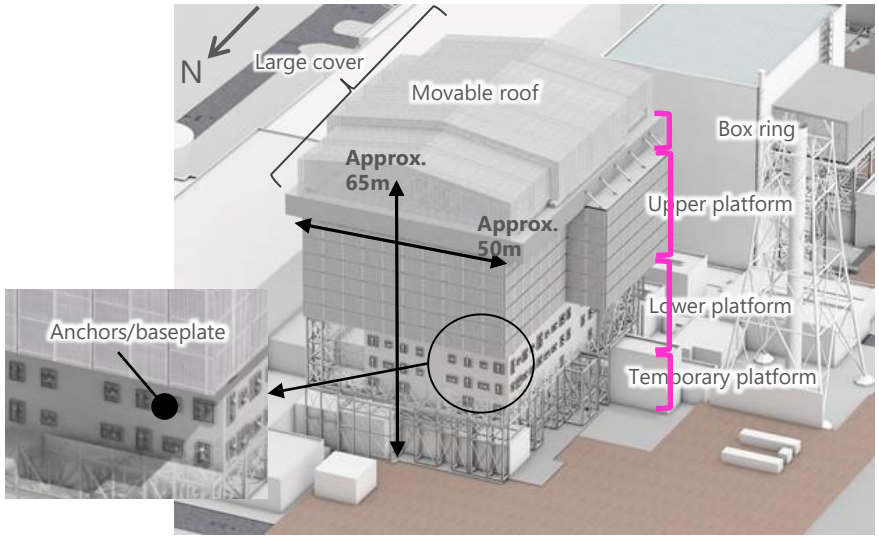
- Rainwater countermeasures include repairing damage to roof buildings, paving ground services to prevent rainwater from seeping into the soil, and waterproofing trenches that connect buildings, etc.
- We continue to repair building roofs and pave surfaces around the Unit 1-4 buildings while aiming to reduce the amount of contaminated water being generated to less than 100m³/day during 2025



Progress with paving ground services inside the land-side impermeable wall around Unit 1-4: approximately 30% (as of the end of FY2021)

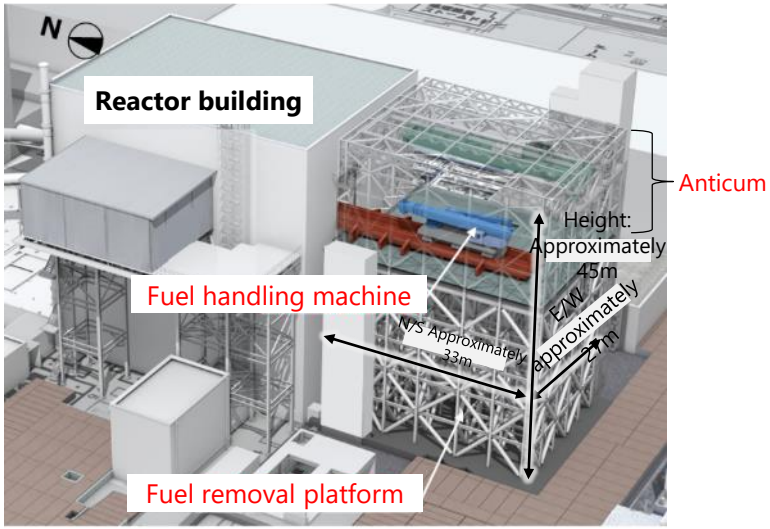
Pool fuel removal: Status of preparations at Units 1 and 2

- Unit 1: Large cover installation
  - The entire operating floor of the reactor building will be covered with a large cover from underneath remotely operated ceiling cranes and dismantling heavy machinery will be used to remove rubble from underneath the cover.
    - ✓ The steel assembly is being built off-site, and as of the end of August 2022, assembly of the temporary platform and the bottom frame had been completed, and approximately 40% of the assembly of the upper frame has been completed.
    - ✓ On site, temporary work platforms are being built in locations where the installation of anchors and baseplates for supporting the large cover has been completed.



Overall diagram of the large cover

- Unit 2: Work platform installation preparations
  - Fuel will be removed using a fuel handling machine from a fuel removal platform built on the south side of the reactor building.
    - ✓ On the operating floor shielding installation that began on February 17, 2022 was completed at the end of May and on August 22 we began removing the FHM operations room.
    - ✓ Outside the building excavation for ground improvement roadbed to build the platform foundation has been completed, and on June 16 we began installation of rebar for the foundation construction. Foundation construction should be completed by around November

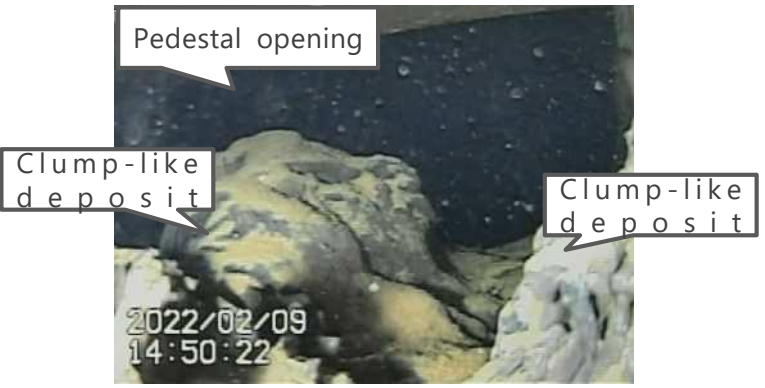


Concept diagram of the platform

＊ The actual platform may differ from this diagram

Fuel debris retrieval: Unit 1 PCV internal investigation

- Clump-like and shelf-like deposits were found over a wide area in the primary containment vessel ➔ It is assumed that they contain deposits originating from fuel debris due to the presence of thermal neutron flux
- At the pedestal opening, exposed rebar from the concrete covering the pedestal was found ➔ Based on the information we have at current time, we've examined the potential impact on the plant from pedestal damage and have determined that the possibility of large failure is low.



Inside the pedestal opening

Near the pedestal opening

Birds eye view of the pedestal opening

Investigation of the area near the pedestal opening using ROV-A (for installing guide rings) (February 9 investigation)

Pedestal opening (immediately inside)

Birds eye view of the pedestal opening (immediately inside)

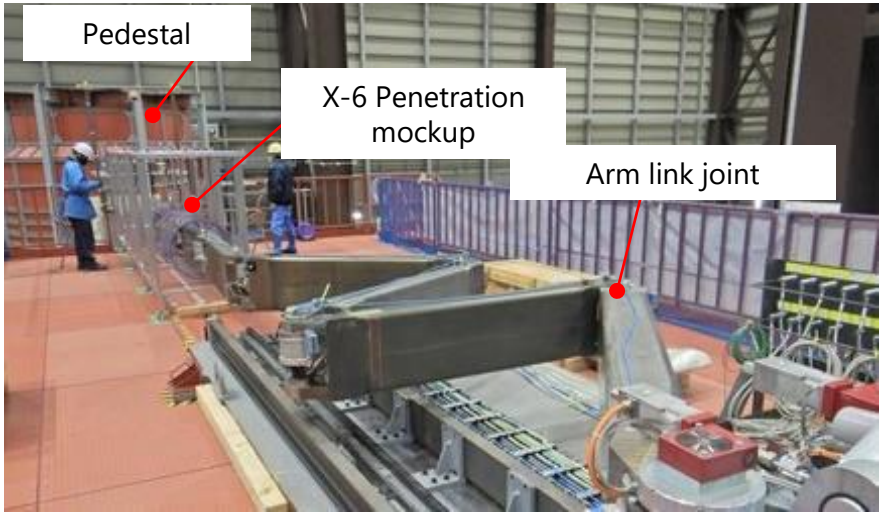
Above the deposits in the pedestal opening (right side of the foundation)

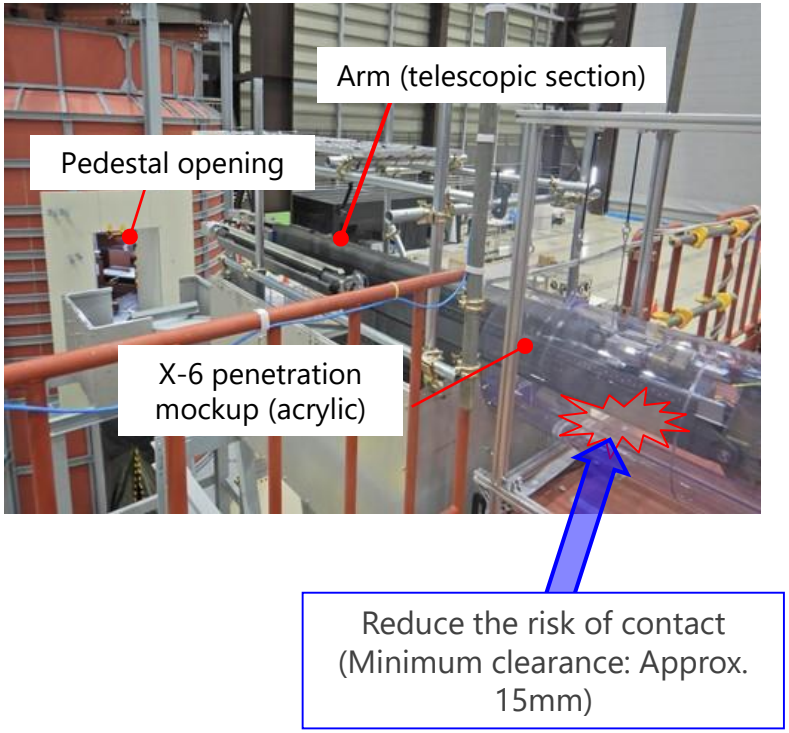
Investigation of the area near the pedestal opening using ROV-A2 (detailed visual investigation) (from May 19 investigation)

Source: International Research Institute for Nuclear Decommissioning (IRID)
・Hitachi GE Nuclear Energy

Fuel debris retrieval: Unit 2 equipment for trial removal

- Robotic arm performance tests
  - An acrylic mockup of the X-6 penetration was used to test the telescopic motion of the robotic arm (point of origin →extension →retraction)
  - An area for improvement that was identified was "improvement of the accuracy of arm link joint positioning." Positioning accuracy will be further improved at Naraha in order to reduce the risk of contact when passing through narrow areas like the X-6 penetration and areas inside the pedestal.





X-6 penetration insertion performance tests at the Naraha Remote Technology Development Center

Source: International Research Institute for Nuclear Decommissioning (IRID)

Fuel debris retrieval: Revising the schedule leading up to Unit 2 trial retrieval

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Robotic arm

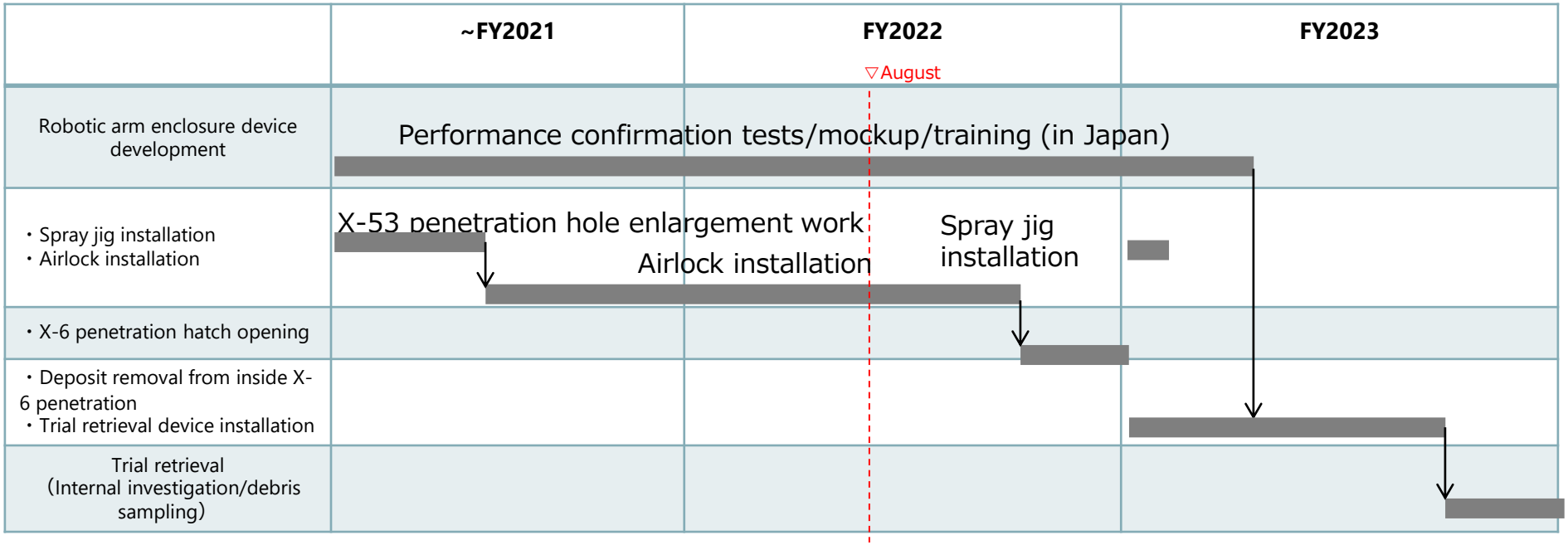
Currently, improvements, such as control program corrections, etc. are being made to enable the discrepancies between data ascertained through mockup tests and the results of prior simulations to be compensated for thereby reducing the risk of contact during fuel debris retrieval.

X-6 penetration airlock

Damage to the airlock's rubber box that occurred during airlock installation, and the guide rollers that were bent during the earthquake, are currently being repaired in preparation for the opening of the X-6 penetration hatch and removal of deposits from inside the X-6 penetration.

➡ In order to improve the safety and reliability of trial retrieval (internal investigations/debris sampling) another six months has been tacked on to the year-long preparation period. So, we intend to commence trial retrieval (internal investigations/debris sampling) around the second half of FY2023.

– This will have no impact on the next step in the process, which is the gradual scaling up of retrieval



2. PROGRESS WITH THE HANDLING OF ALPS TREATED WATER

Overview of ALPS treated water dilution and discharge facilities and related facilities

TEPCO

Secondary treatment facilities (newly installed reverse osmosis membrane device)

For the secondary treatment of water being treated for which the sum of legally required concentrations of nuclides, except for tritium, is between 1~10.

Secondary treatment facilities（ALPS）

For the secondary treatment of water being treated for which the sum of legally required concentrations of nuclides, except for tritium, equals or exceeds 1.

ALPS treated water, etc. tanks

Measurement/inspection facilities

Consists of three sets of tanks for receiving, measurement/inspection, and discharge. During the measurement/inspection process, water is sampled after homogenization by mixing/agitation, and analyzed. (Approx. 10,000m³ x 3 groups)

Used in rotation

Discharge

Receiving

Measurement /Inspection

ALPS treated water transfer pump

Transfer facilities

Seawall

Erected mainly around emergency shut-off valves and transfer pipes

Flow meter/Flow regulation valve/emergency shut-off valve（Tsunami countermeasures）

Seawall

Seawater pipe header
(Diameter: Approx. 2m x Length: Approx. 7m)

Emergency shut-off valve

33.5m above sea level

11.5m above sea level

2.5m above sea level

Seawater flow meter

Seawater transfer pipe (3)

Seawater pipe

Road

Discharge shaft (downstream water tank)

Dilution facilities

Unit 5 intake channel

Seawater for dilution (Taken from outside the harbor)

Discharge shaft (upstream water tank)

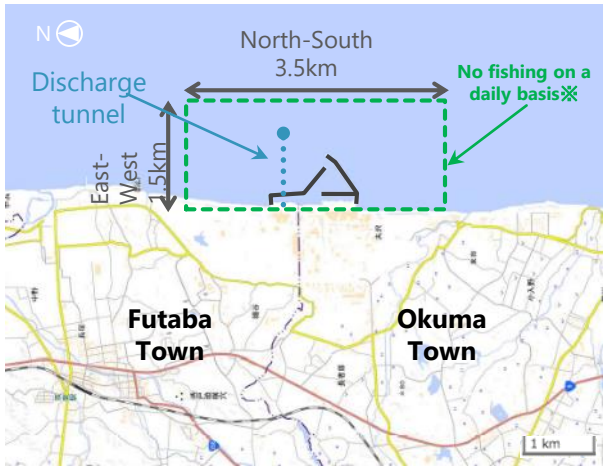
Discharge tunnel（Approx. 1㎞）

To ocean

Discharge facilities

The water head difference (difference between the water level in the downstream water tank and sea level) will counteract the loss of the discharge tunnel and enable the water to flow downstream naturally.

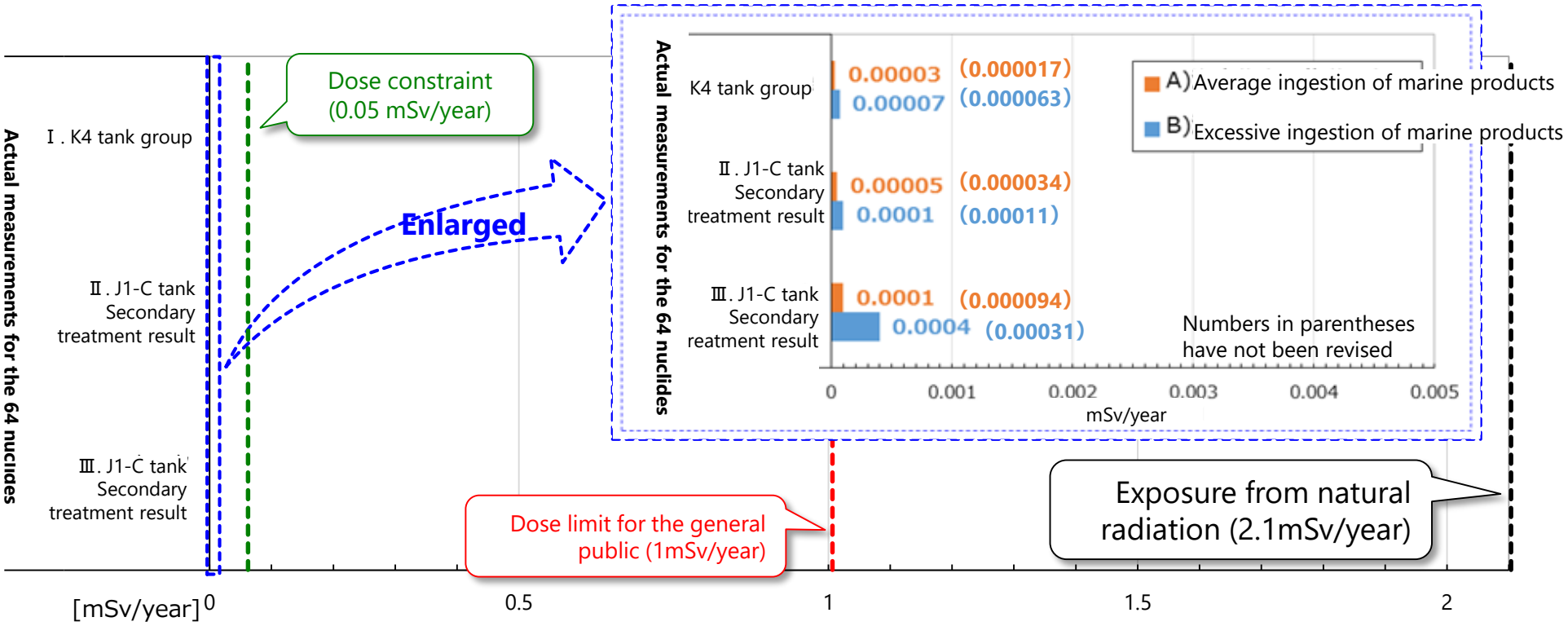
Source: Created by Tokyo Electric Power Company Holdings, Inc. based on maps from the Geographical Survey Institute (Digital GSI Maps)
https://maps.gsi.go.jp/#13/37.422730/141.044970/&base=std&ls=std&disp=1&vs=c1j0h0k0l0u0t0z0r0s0m0f1



※：Area for which joint fishing rights have not been established

Human exposure assessment results

- Assessment results based on actual measurements of the 64 nuclides show that exposure for the general public will be approximately 1/30,000~1/3000 that of dose limits (1mSv/year), which is approximately 1/2000~1/100 that of the dose target for domestic nuclear power stations (0.05mSv/year) that corresponds to dose constraints



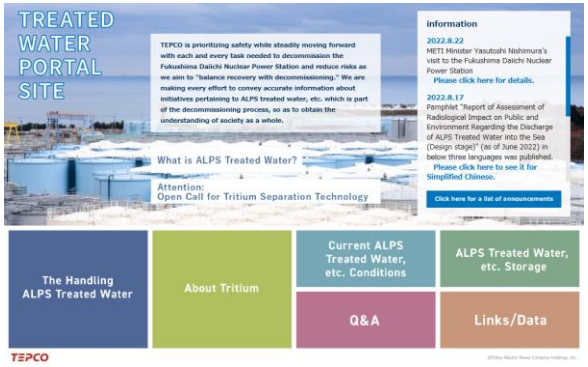
Communicating information to promote understanding

Communicating information through the media

➥ Press releases, press conferences, site tours, briefings, etc.

Creating and developing tools

➥ Treated water portal site, videos, etc.



Tours and symposiums

➥ Tours of Fukushima Daiichi, symposiums, online tours, etc.

Comparison with international safety standards

➥ Safety assessments by international nuclear power agencies