FPCJ Press Briefing

Fukushima Daiichi Decontamination and Decommissioning : Current Status and Challenges

February 25, 2019

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Chief Decommissioning Officer

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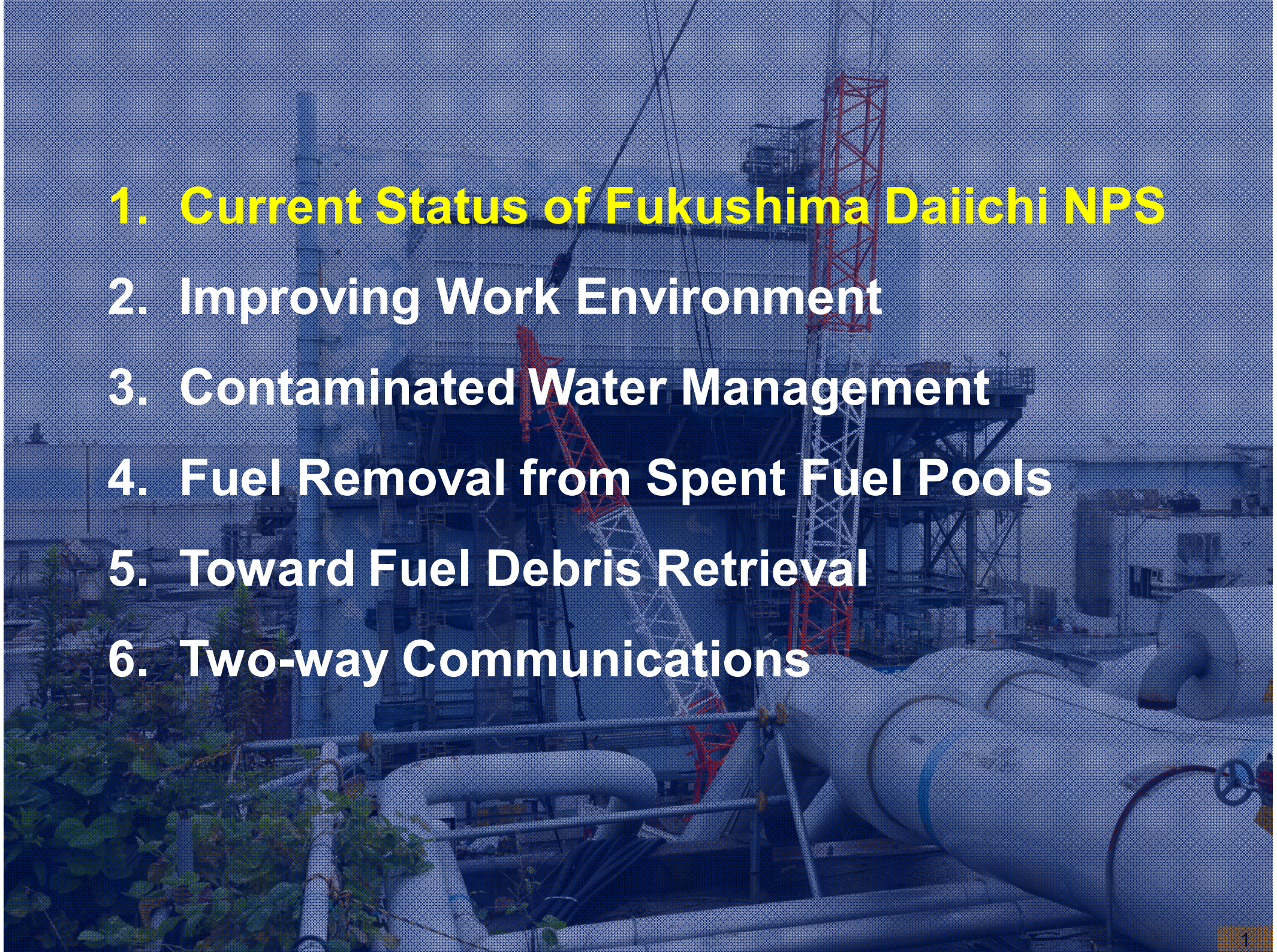
Tokyo Electric Power Company Holdings, Inc.

TEPCO



1. Current Status of Fukushima Daiichi NPS
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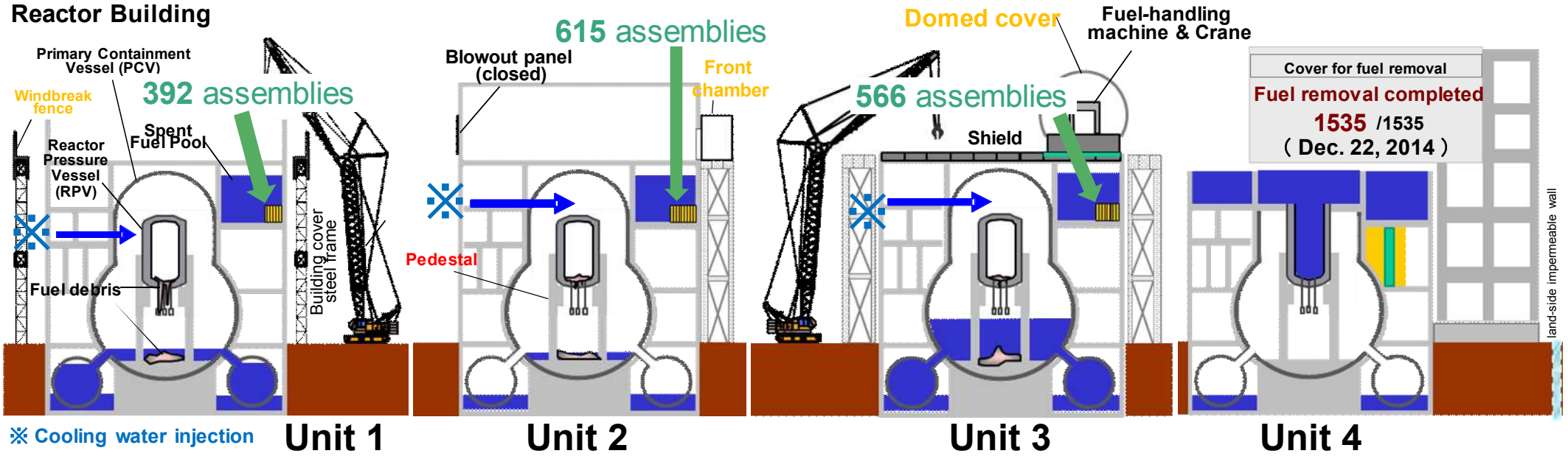
5. Toward Fuel Debris Retrieval
6. Two-way Communications

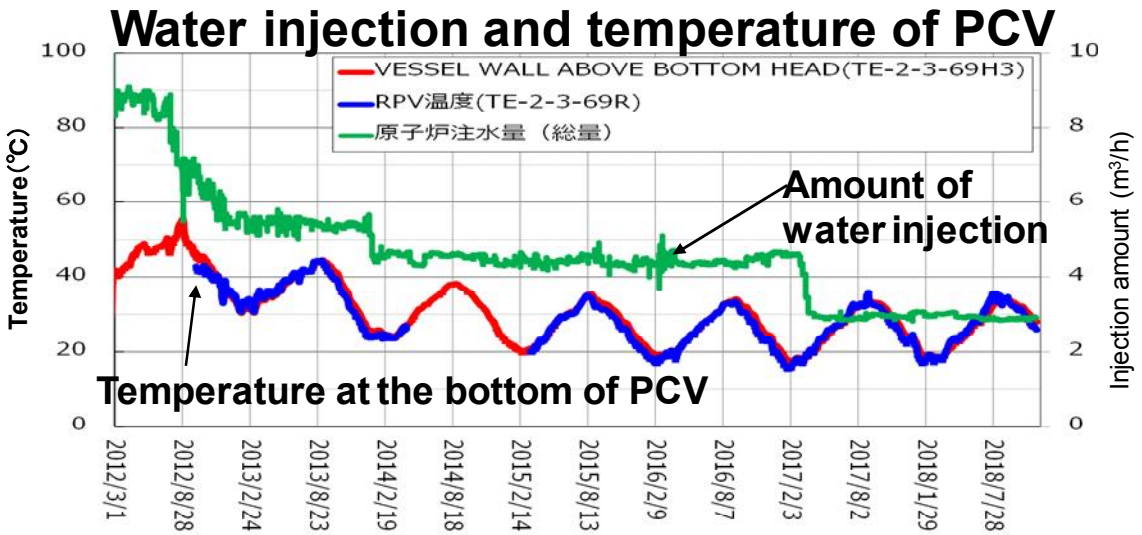
State of Units 1 - 4

- All reactors are in cold shutdown condition.
- The temperatures of PCV and RPV have been stabilized in spite of decrease of water injection.



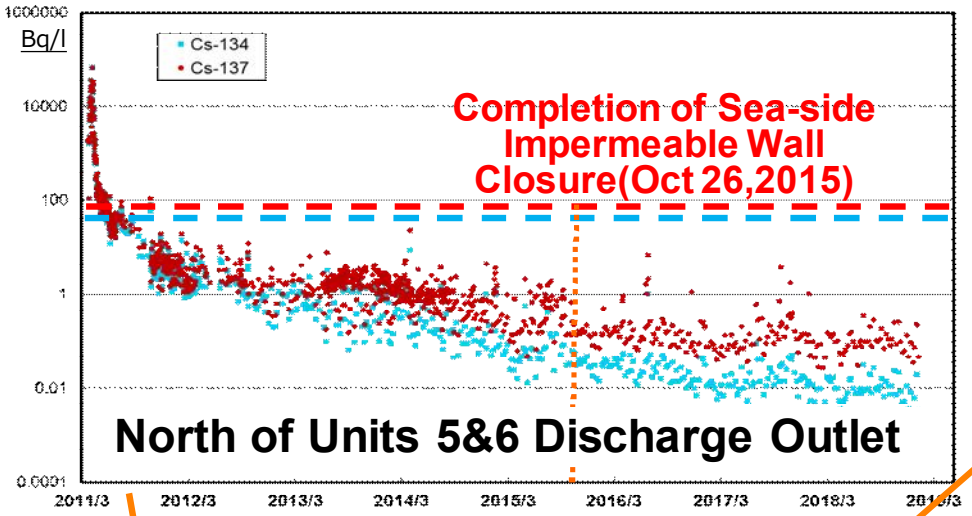
Values as of 11:00 am on February 6, 2019

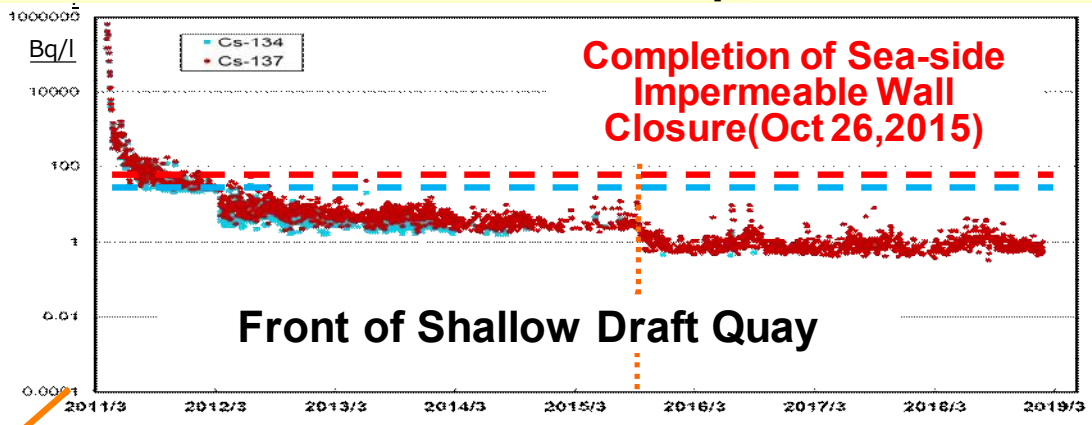
	Temperature at the bottom of the pressure vessel	Temperature inside the containment vessel	Fuel pool temperature
Unit 1	15 ℃	15 ℃	22 ℃
Unit 2	21 ℃	22 ℃	22 ℃
Unit 3	19 ℃	19 ℃	21 ℃



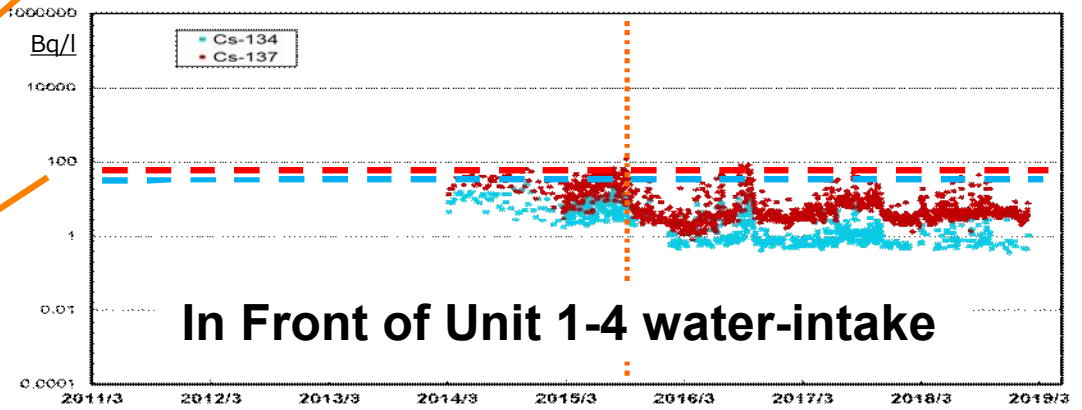
Monitoring Level in the Sea

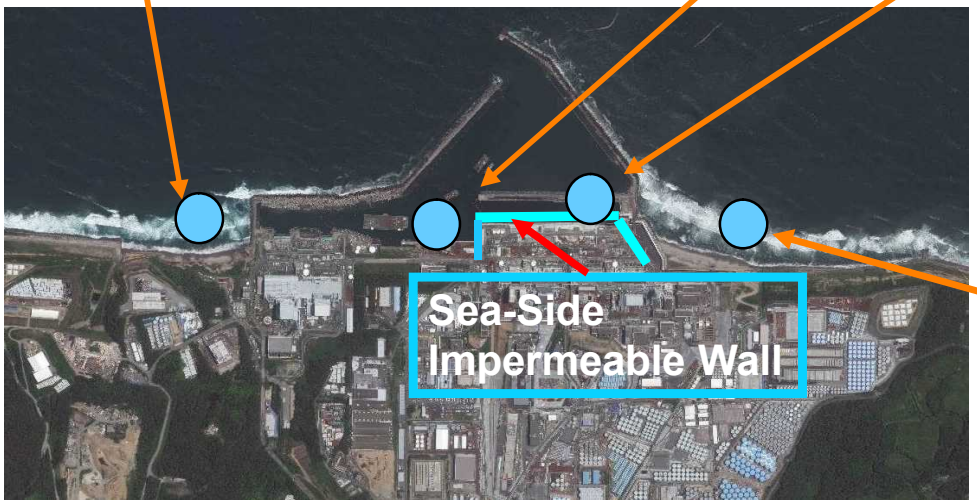
- Compared to the situation just after the accident, the current level of radioactivity has been lowered to less than per million at the lowest.
- The concentrations outside the port are substantially below regulation limits.
- Concentration levels decreased further after the closure of the sea-side impermeable wall.

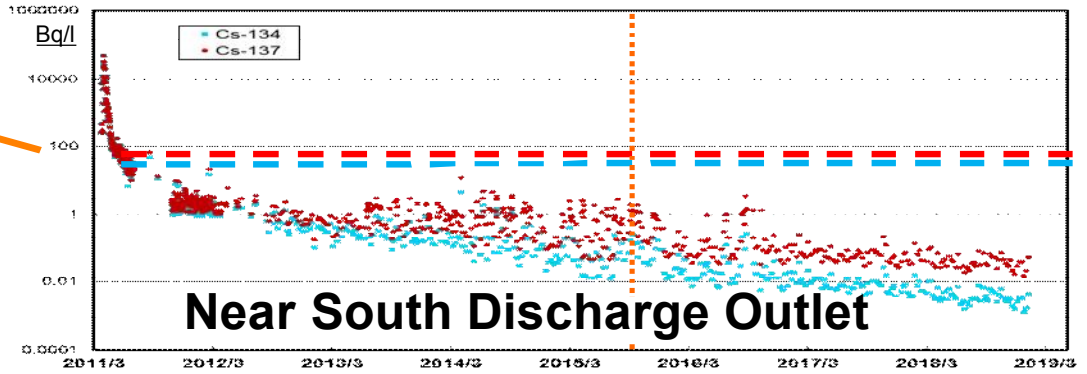




Regulation Limit
- Cesium 137: 90Bq/L
- Cesium 134: 60Bq/L







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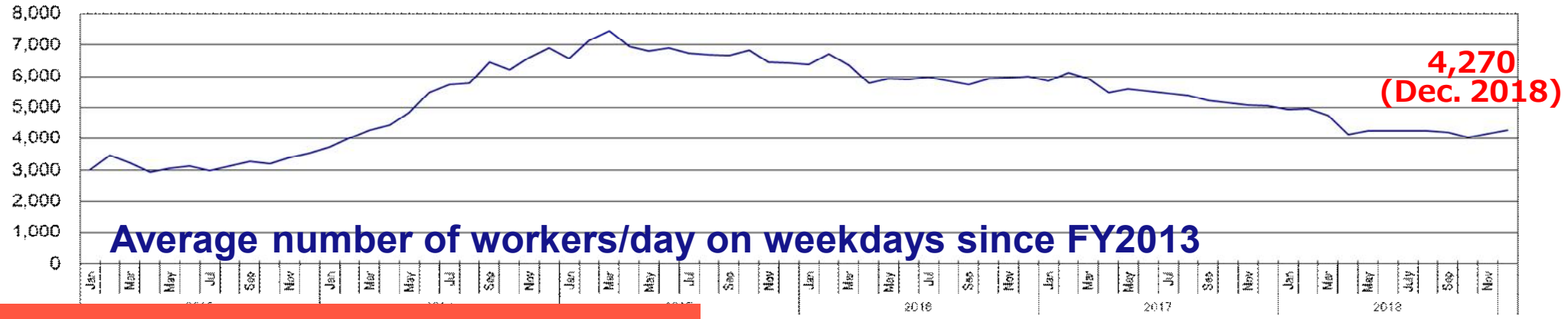
Number of Site Workers and Change in Exposure Dose Level

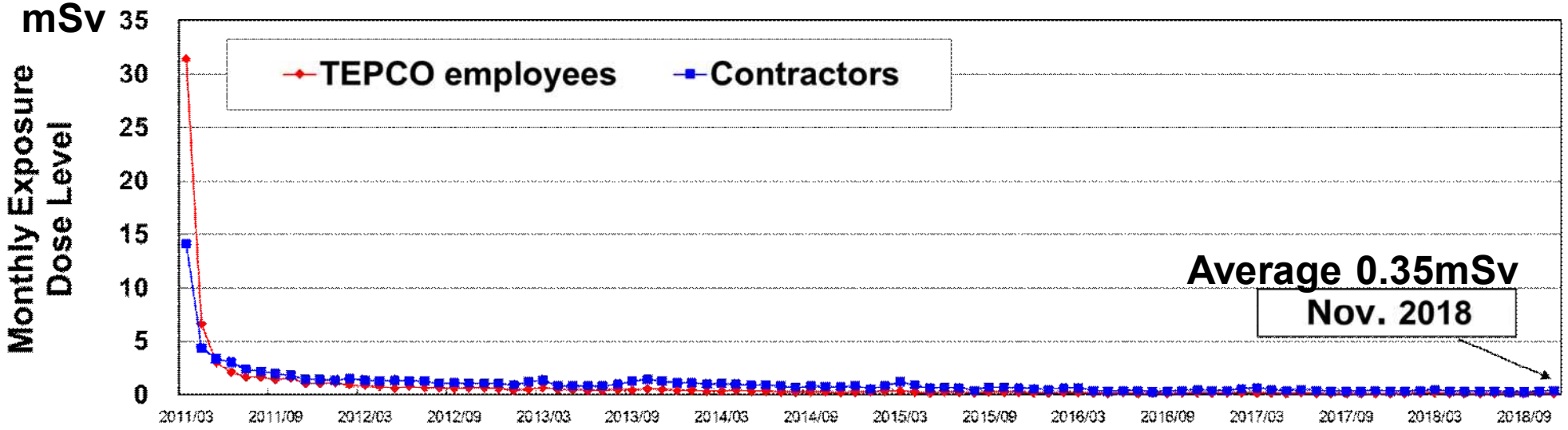
- **Currently about 4,000 people／day are working on weekdays.**
- **The exposure dose climbed to 21.59mSv/m in March 2011 but it has plunged to around 0.3mSv/m in recent months.**

Changes in number of workers (TEPCO & Contractors)

- Average number of workers engaged in work on weekdays is 4,270 as of December 2018.
- Percentage of workers from local area is approx. 60% as of December 2018.



Trend of monthly exposure dose rate

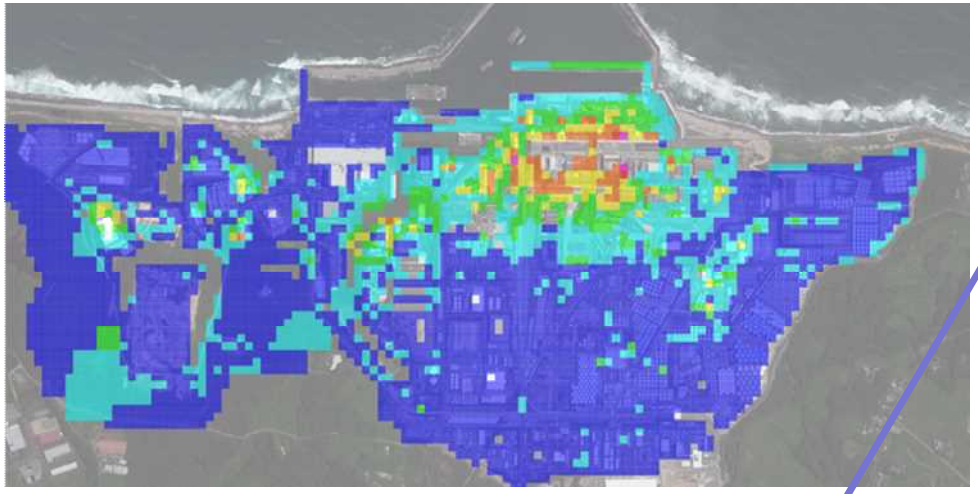


Decreasing Site Radiation Dose

- As a result of radiation reduction measure, workers don't have to wear full-face respirators or half-face respirators anymore in most parts of the site.

Distribution of dose level

: Area below 5μSv/h (Feb. 2018)



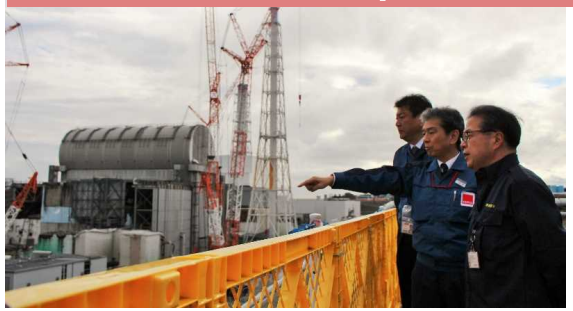
Zoning on the site（May 2018)

Area where people should work in protective gears

Area where people can work in general uniforms

【96% of the site】

Site touring by cabinet members (Dec. 2018）



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Three Principles for Measures to Counter Contaminated Water

Principle 1: Removing source of contamination

① Purification of contaminated water using Multi-nuclide Removal Equipment (ALPS)

② Removal of contaminated water from trenches

Principle 2: Isolating fresh water from contaminated areas

③ Pumping up groundwater using groundwater bypass system

④ Pumping up groundwater using subdrain wells

⑤ Installation of Landside Impermeable wall (Ice Wall)

⑥ Pavement to prevent rain water from penetrating into the ground

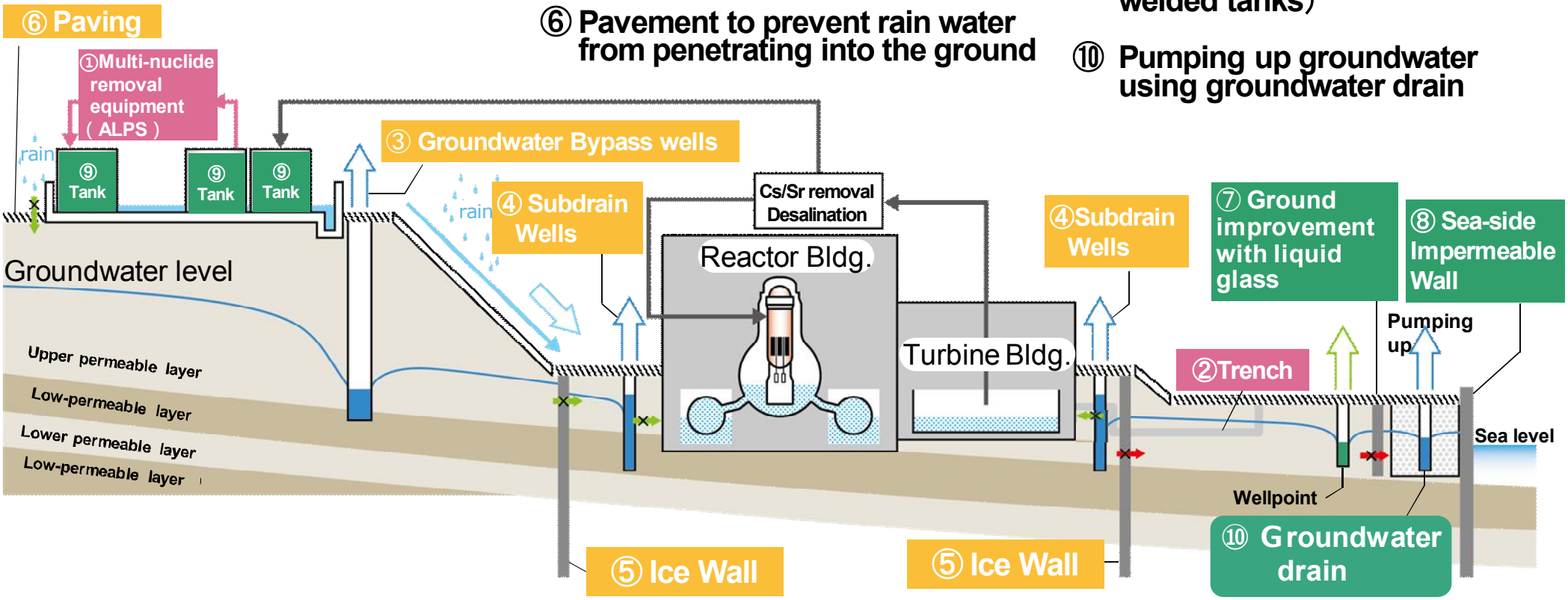
Principle 3: Preventing leakage of contaminated water

⑦ Ground improvement with liquid glass

⑧ Installation of Sea-side Impermeable Wall

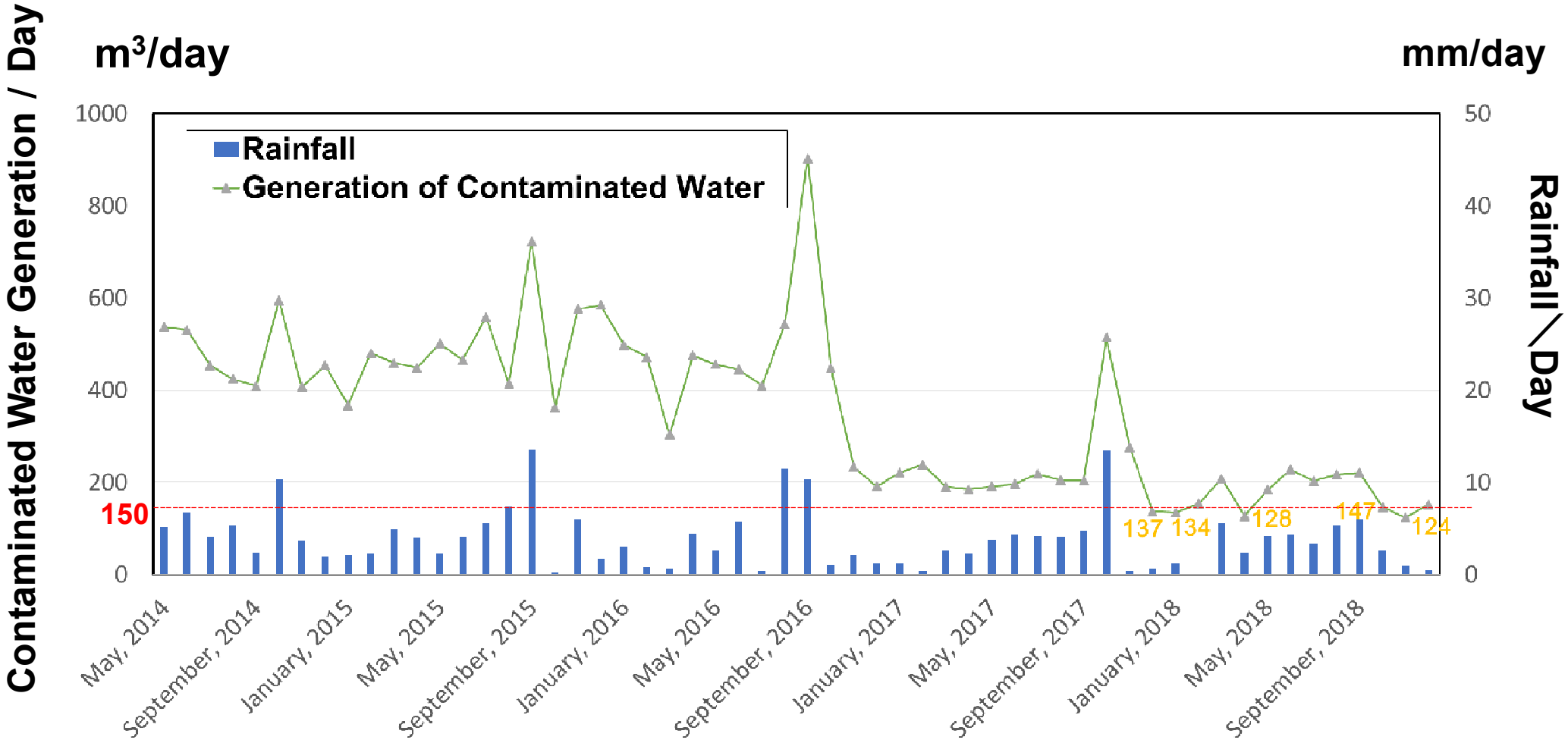
⑨ Augmentation of tanks (Replacement with more reliable welded tanks)

⑩ Pumping up groundwater using groundwater drain



Reduction of Contaminated Water Generation

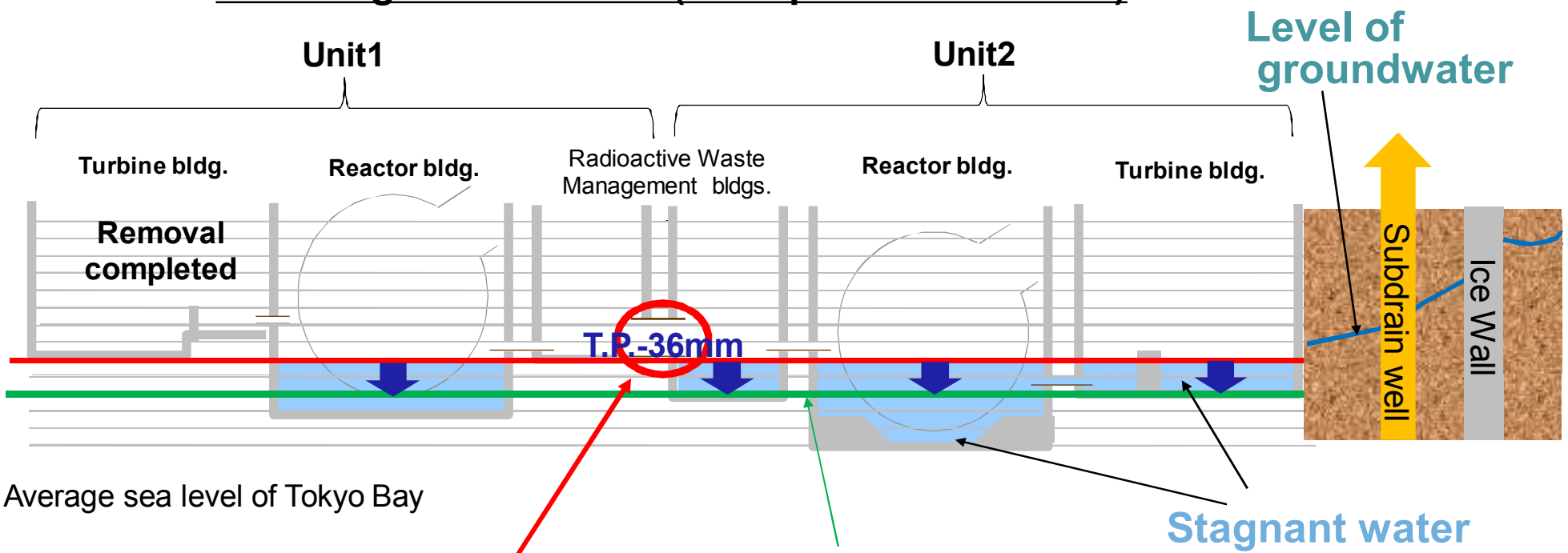
- Generation of the contaminated water decreased to 220m³/Day (average value in FY 2017) from 470m³/Day (average value in FY2014 when countermeasures have not been taken) as a result of multilayered measures.
- Will continue to take additional measures against the inflow of rainwater etc., and aim to reduce the generation to 150m³/day on an annual basis within FY2020.



Removal of Stagnant Water in the Buildings

- Since it contains radioactive materials, stagnant water in the buildings should be prevented from flowing out.
- In order to reduce the risk, we plan to continue to reduce the water and complete the process within 2020.

Lowering of water level (example at Units 1 & 2)



∗ T.P.: Average sea level of Tokyo Bay

Separation of the connected part between Units 1 & 2 (Sep. 13, 2018)

Allow for stagnant water management unit by unit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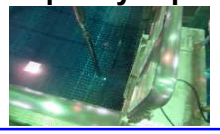
Overview of Fuel Removal from the Spent Fuel Pools

- **After the completion of removal at Unit 4 in December 2014, preparation at Units 1 through 3 is underway**

Units 1 & 2	Unit 3		Unit 4
Removal of rubble & Decontamination	Installation of fuel removal facility	Fuel removal	Storage & Transportation
Large cranes and heavy machinery used	Fuel removal cover (or container) and Fuel Handling Machine etc. installed	Removing & transporting fuel to common pool	-Storing fuel in common pools - If necessary, fuel to be transported to dry cask temporary storage facilities in order to secure capacity at pools







Unit 1

- Removal of rubble started on the north side (Jan. 2018)

Unit 2

- The front chamber was installed (Feb. 2017)
- Preparatory work on the refueling floor (Since Jul. 2018)

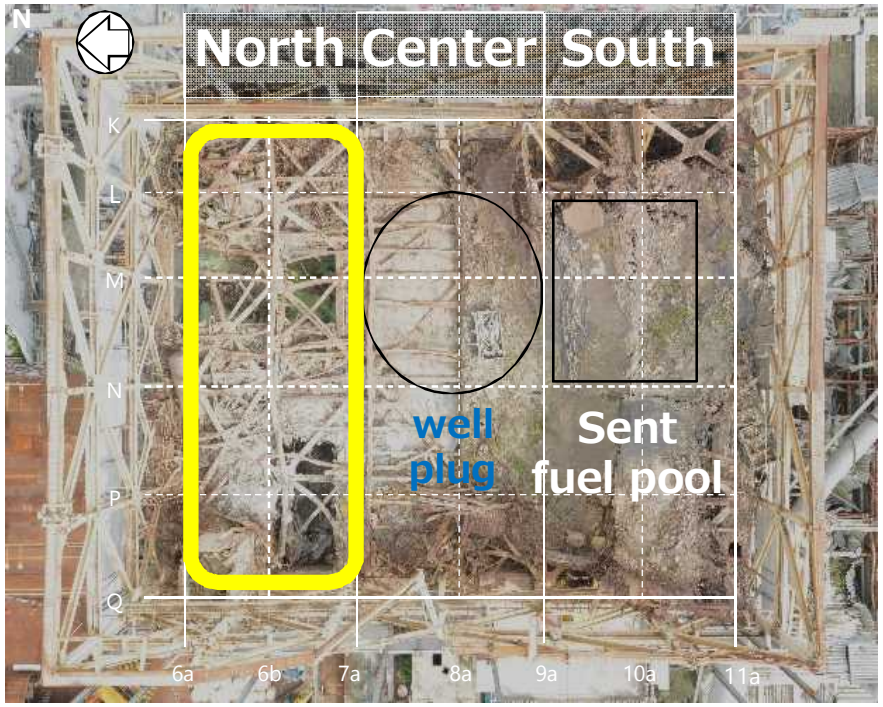
Unit 3

- Installation of the fuel removal cover was completed (Feb. 2018)
- Final stage for starting removal (As of late Feb.)

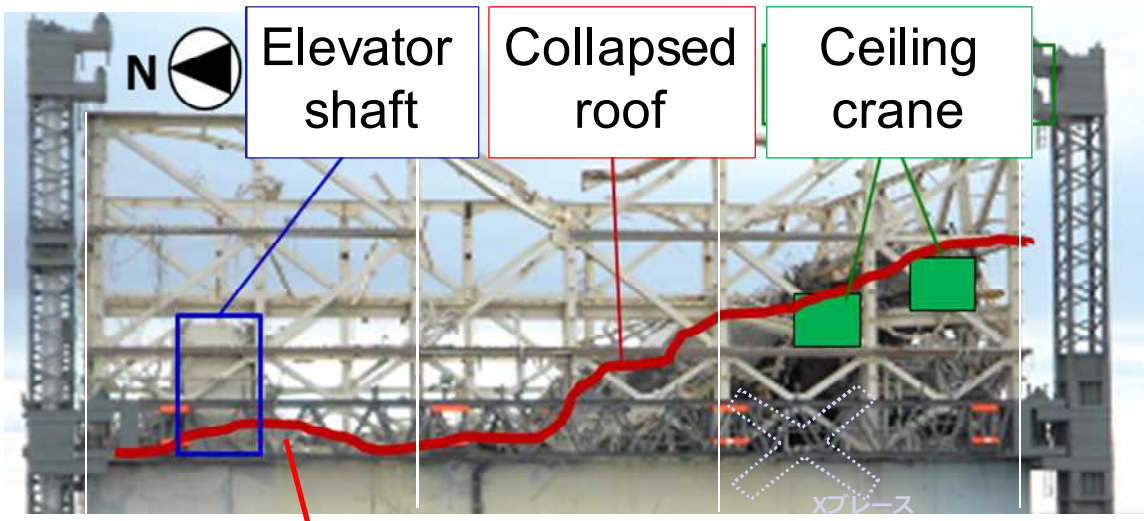
Toward Fuel Removal from Spent Fuel Pool (Unit 1)

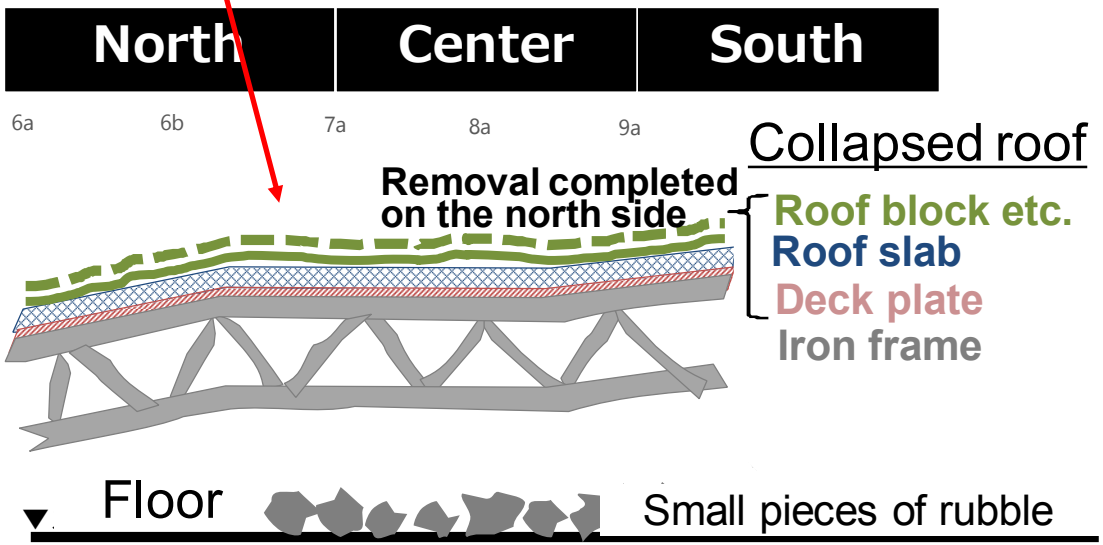
- Removal of rubble including roof blocks, roof slab and deck plate has been completed on the north side of the refueling floor.
- Removing layers of rubble on the south side is a big challenge.

Refueling floor
(Fair surface: photographed in last Sep.)



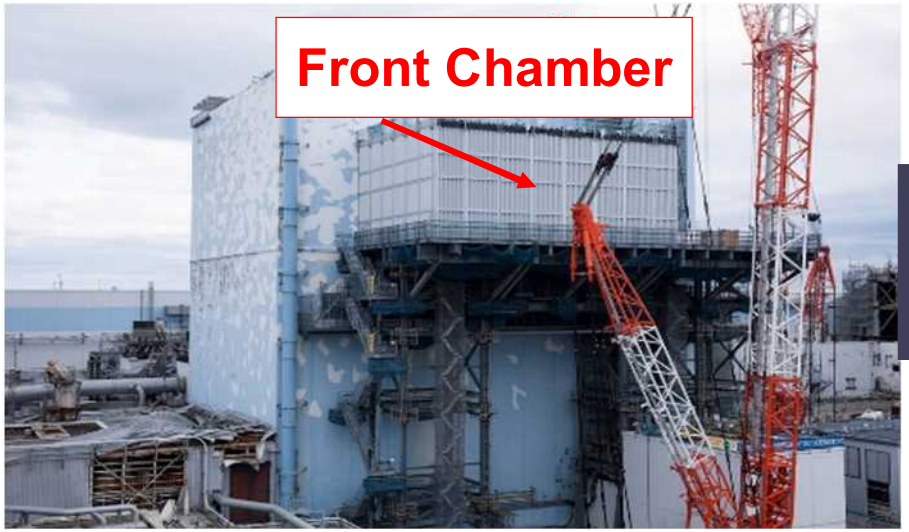
Refueling floor
(Elevation surface of west side)



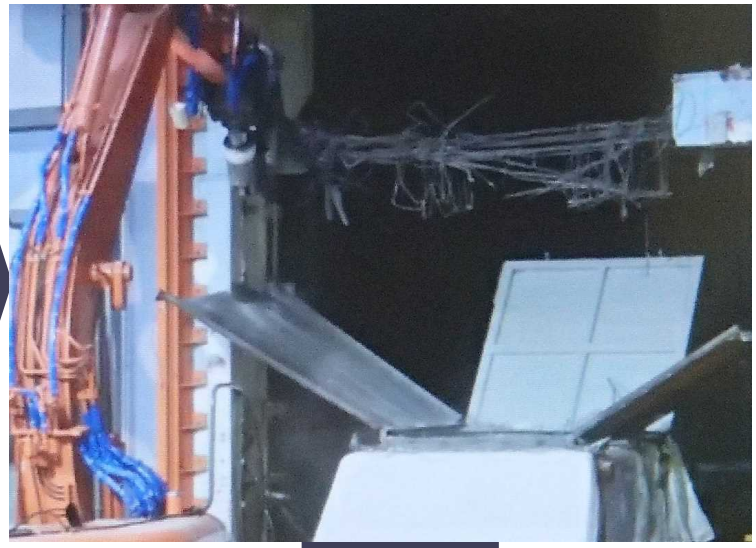


Toward Fuel Removal from Spent Fuel Pool (Unit 2)

Installation of Front Chamber (2017)

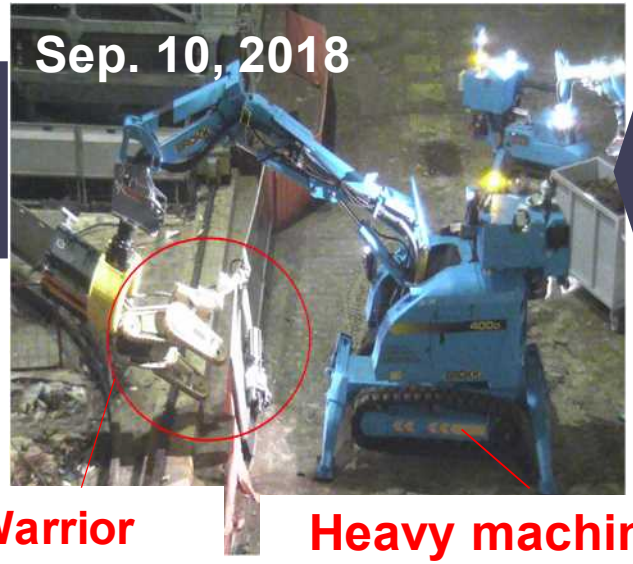


Formation of Opening (Jun. 2018)



Survey on Refueling Floor (Jul. 2018)

Clearing remaining objects (from Aug. to Nov. 2018)



Survey on Refueling Floor (from Nov. 2018 to Feb. 2019)

Planning for future task

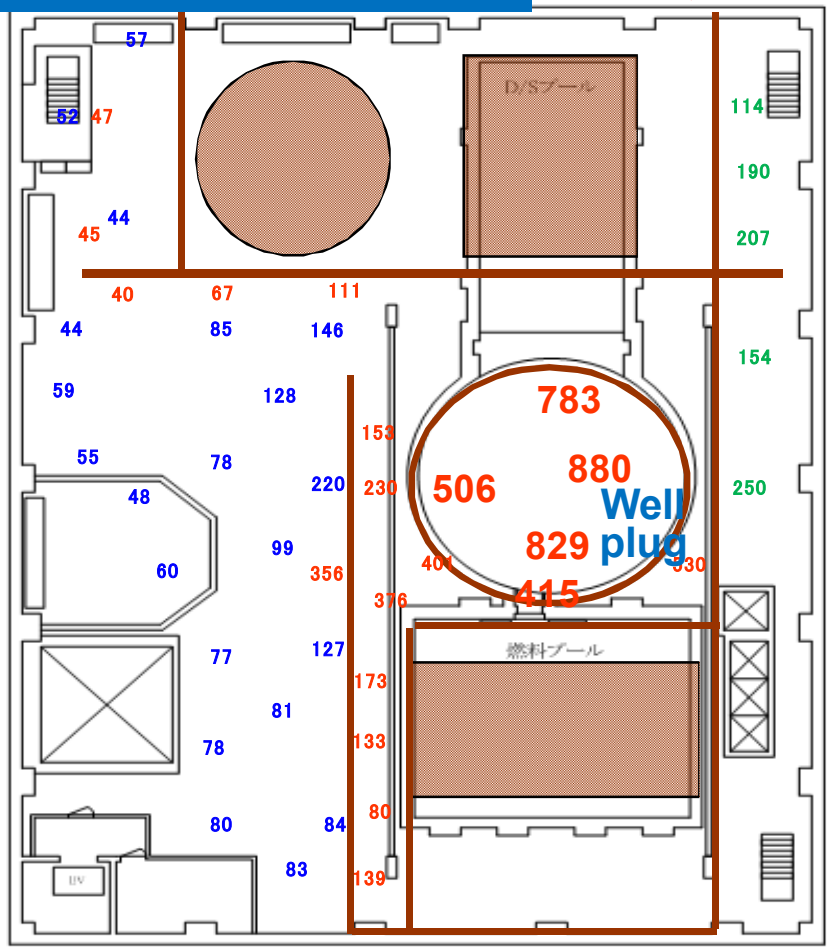
Results of Air Dose Rate Measurement at Unit 2 Refueling Floor

- The source of radioactivity is assumed to be the well plug, because the dose rates decrease with increasing distance from the well plug.
- The dose rates are much smaller than those in 2011 and 2012.

<Previous investigation>

On the well plug : About 400～800mSv/h

Nov. 2, 2011 (G)
Feb. 27, 2012 (B)
Jun. 13, 2012 (R)



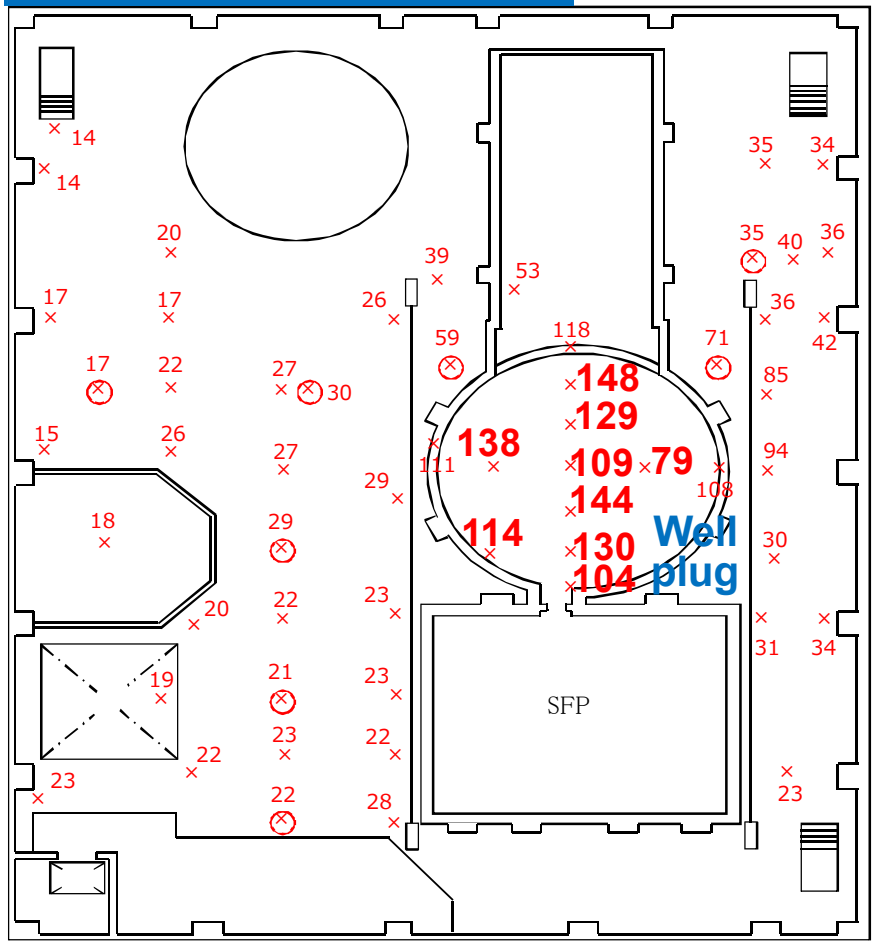
Measurement height : 1.1m ※1cm dose equivalent

<The latest investigation>

On the well plug : About 100～150mSv/h

From Nov. to Dec. 2018 (R)

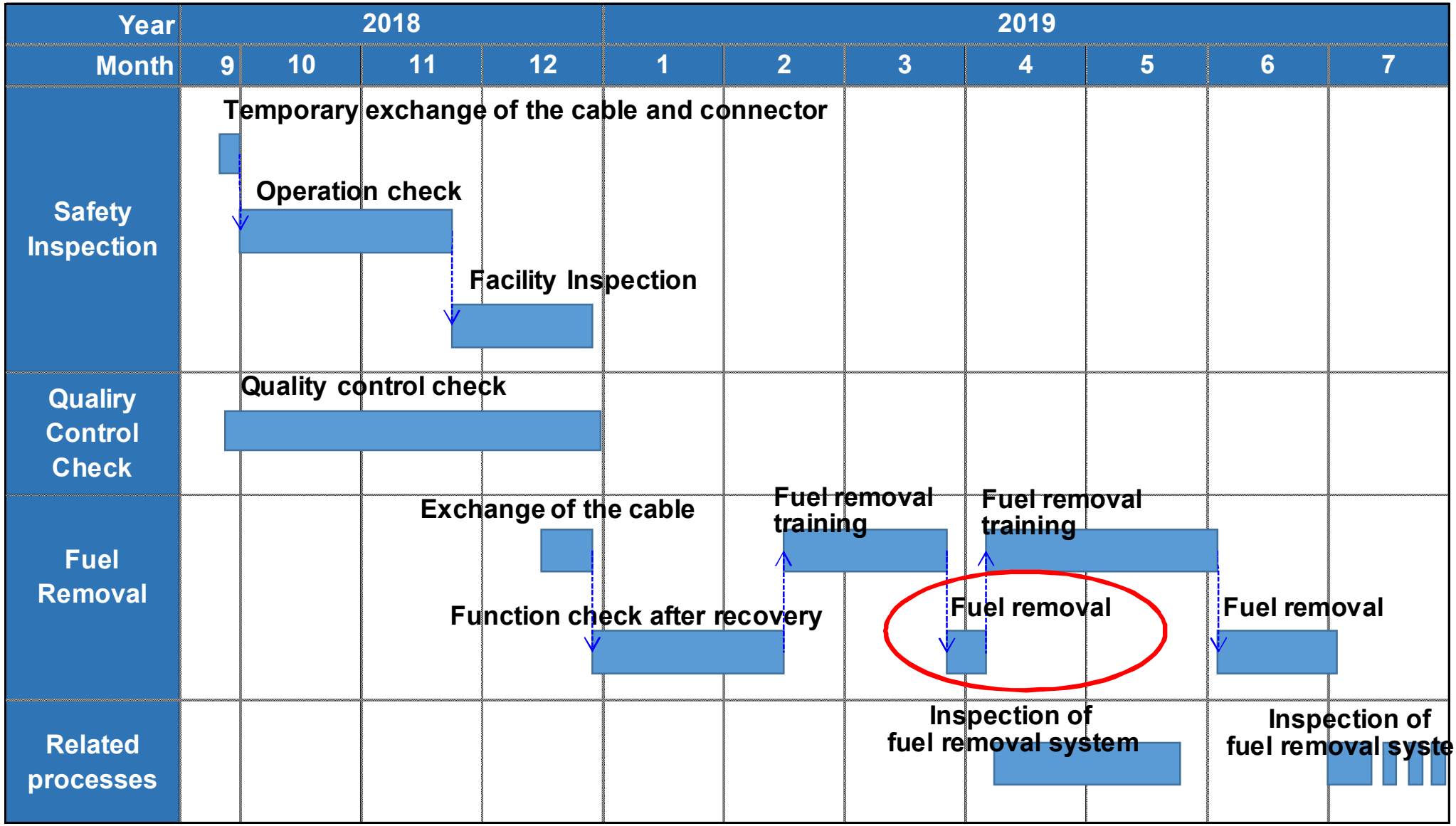
Unit : mSv/h

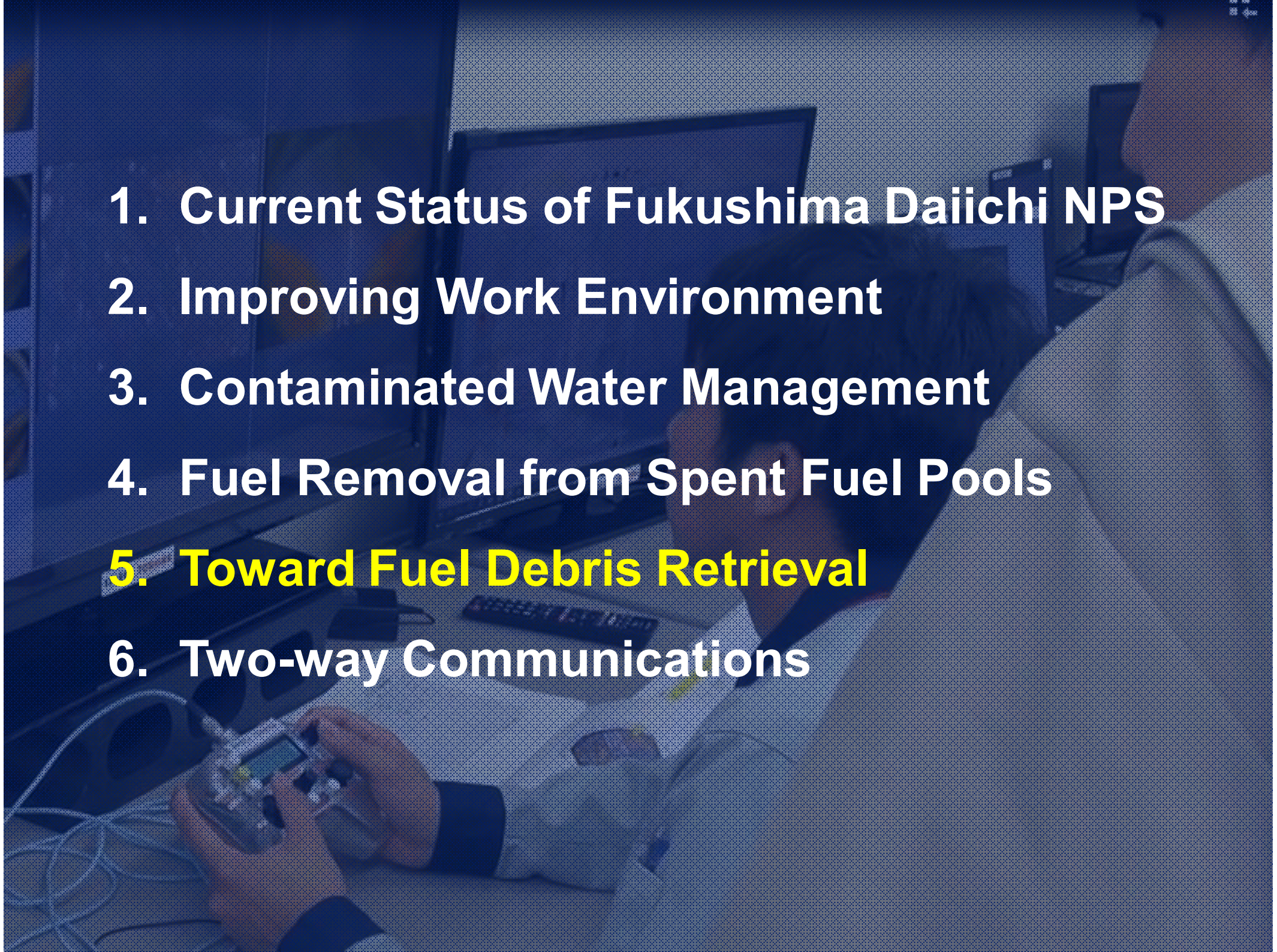


Measurement height : 1.5m ※1cm dose equivalent

Fuel Removal at Unit 3

- The fuel removal is starting at the end of March.
- We aim to finish the work within FY2020.





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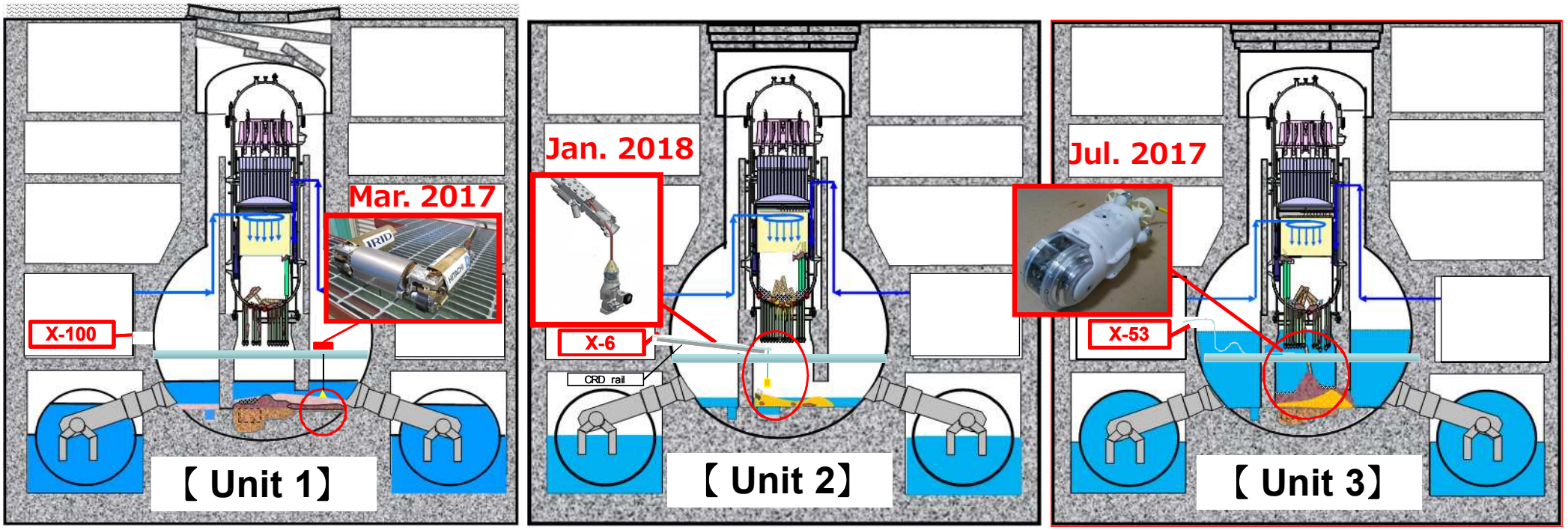
Assumed Distribution of Fuel Debris

- Investigations suggest that almost all of the fuel in Unit 1 melted and dropped to the bottom of the PCV and most of it is no longer in the reactor's core.
- As for Unit 2, it is assumed that some of the molten fuel dropped to the bottom of the RPV or to the lower portion of the PCV, while some still remain within the core.
- As for Unit 3, it is thought that most of the molten fuel dropped to the bottom of the PCV, but some is also present at the bottom of the RPV.



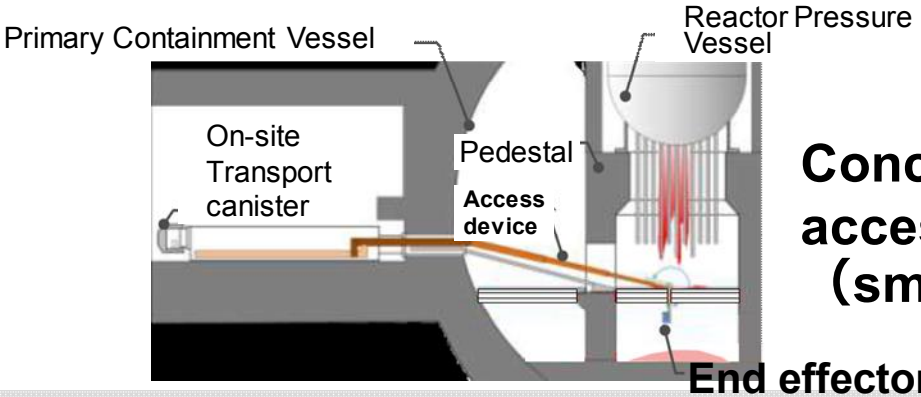
※Periods shown above indicate when the internal investigation took place between 2017 and 2018 (photos：courtesy of IRID)

Toward Fuel Debris Retrieval

- In the Mid-and-Long-Term Roadmap revised in September, 2017, “Policy on fuel debris retrieval” was determined.
  - Approach focused on partial submersion method, Prioritizing fuel debris retrieval by access to the bottom of the PCV from the side
  - Step-by-step approach
- In the near future, investigation inside the PCVs (including small amount sampling) will be implemented.

Environmental Arrangement → Internal investigation・Small amount sampling → Fuel debris retrieval

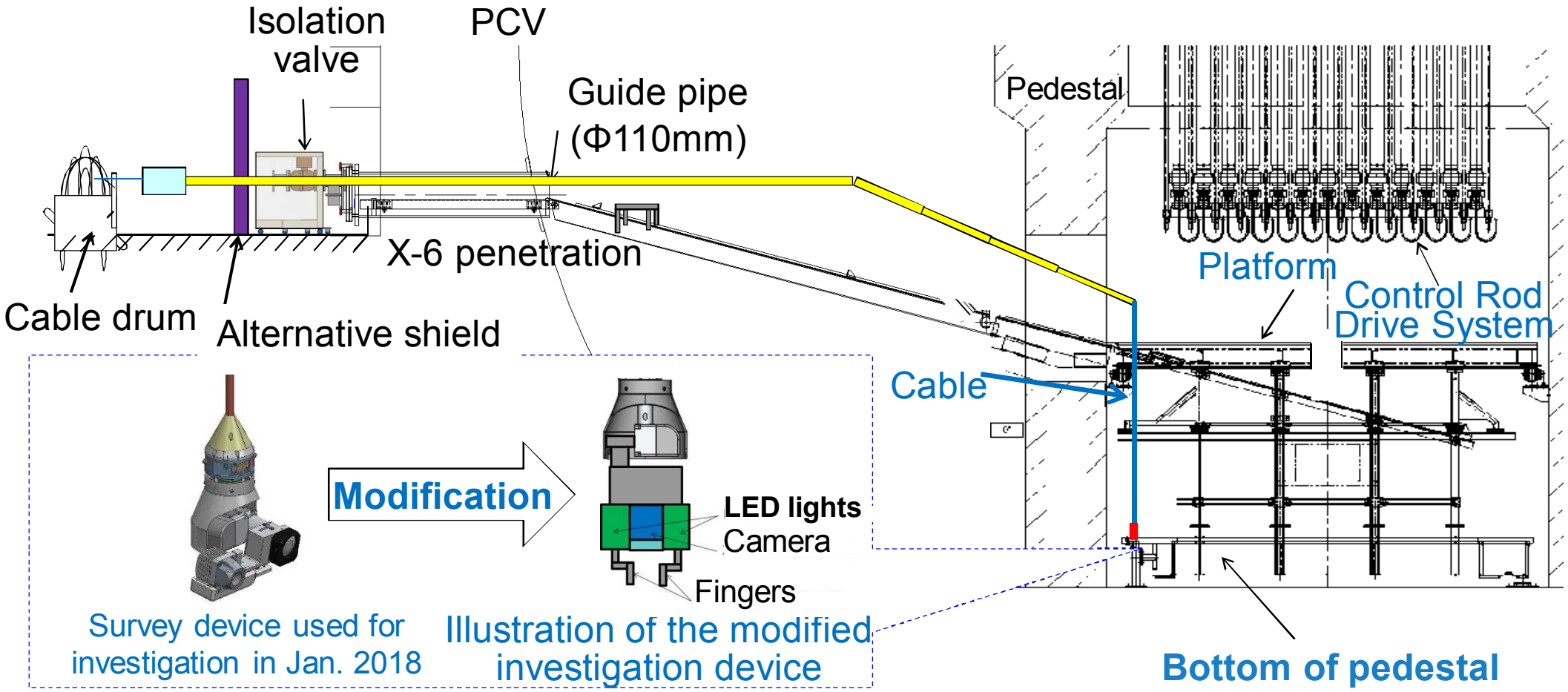
Even though we prioritize access to the bottom of the PCVs, we will consider implementing “top entry method” as well, taking into account that fuel debris is assumed to exist both at the bottom of the PCVs and inside the RPVs.



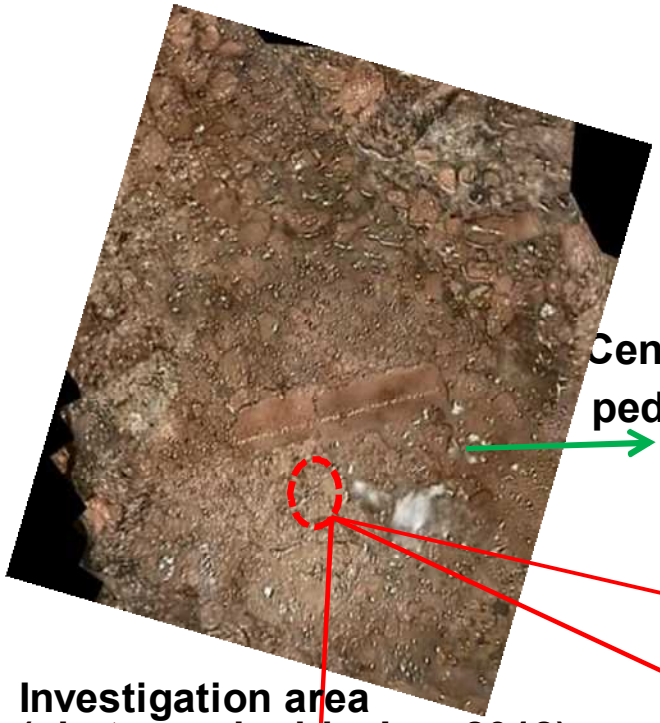
Conceptual diagram of fuel debris retrieval by access to the bottom of the PCV from the side (small scale retrieval)

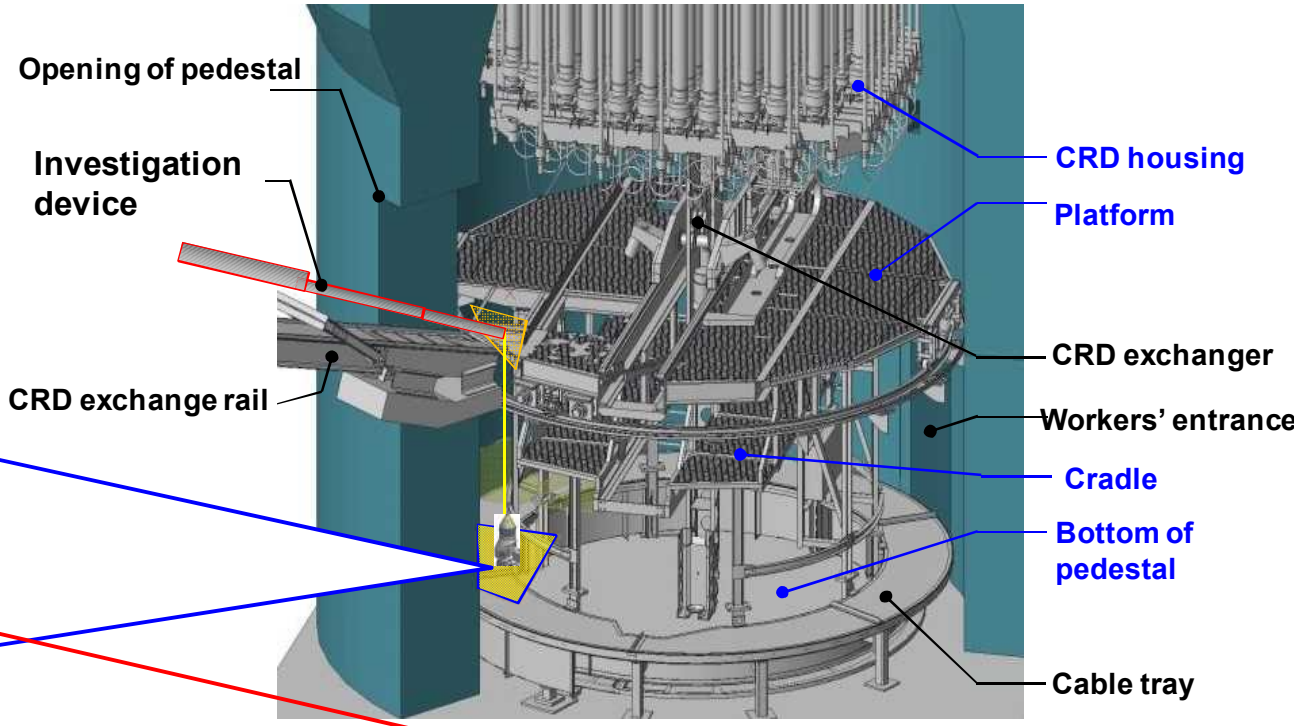
Investigation of Unit 2 PCV Using a Modified Guide Pipe (Feb. 13, 2019)

- **In order to understand the mobility of deposits found at the bottom of the pedestal, a new guide pipe modified from the existing one was used.**
- **Five out of the six investigated locations have been found to have movable pebble-like deposits.**



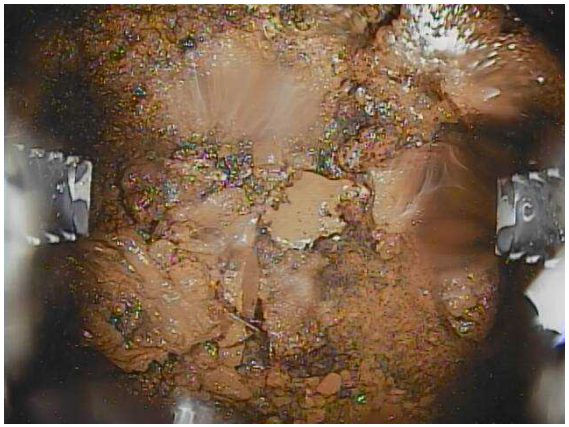
The Investigation Result (1/3)





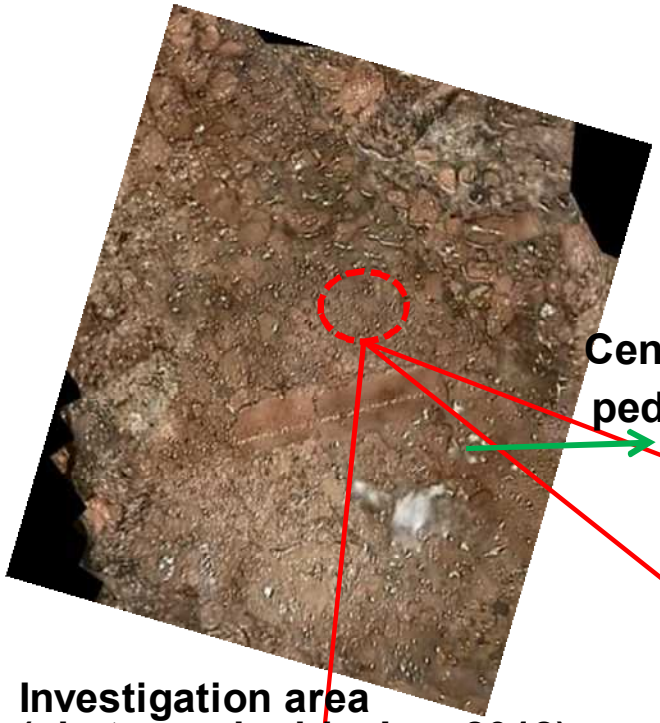
Before touching deposits

During touching deposits



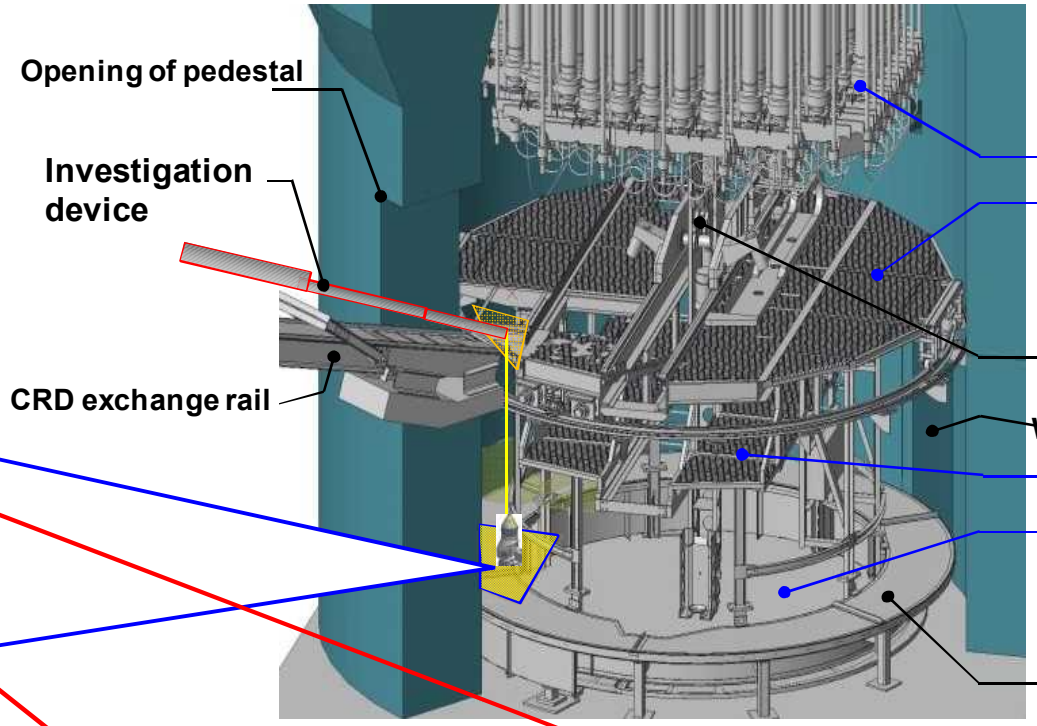
After touching deposits

The Investigation Result (2/3)

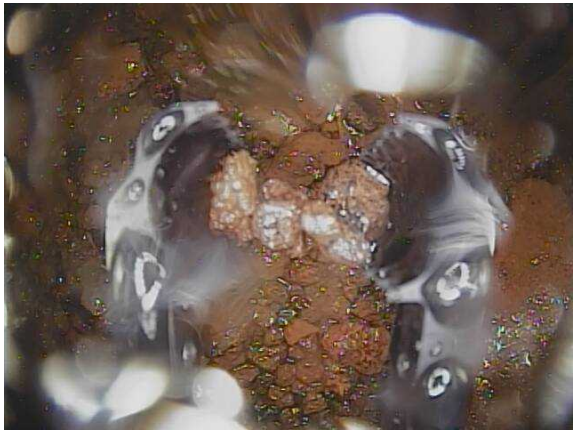


Center of pedestal

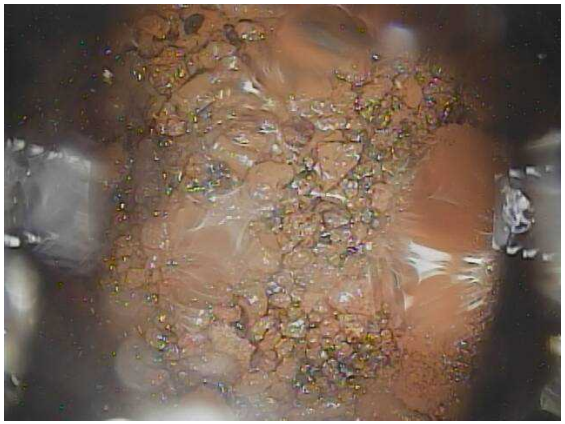
Investigation area
(photographed in Jan. 2018)



Before touching deposits

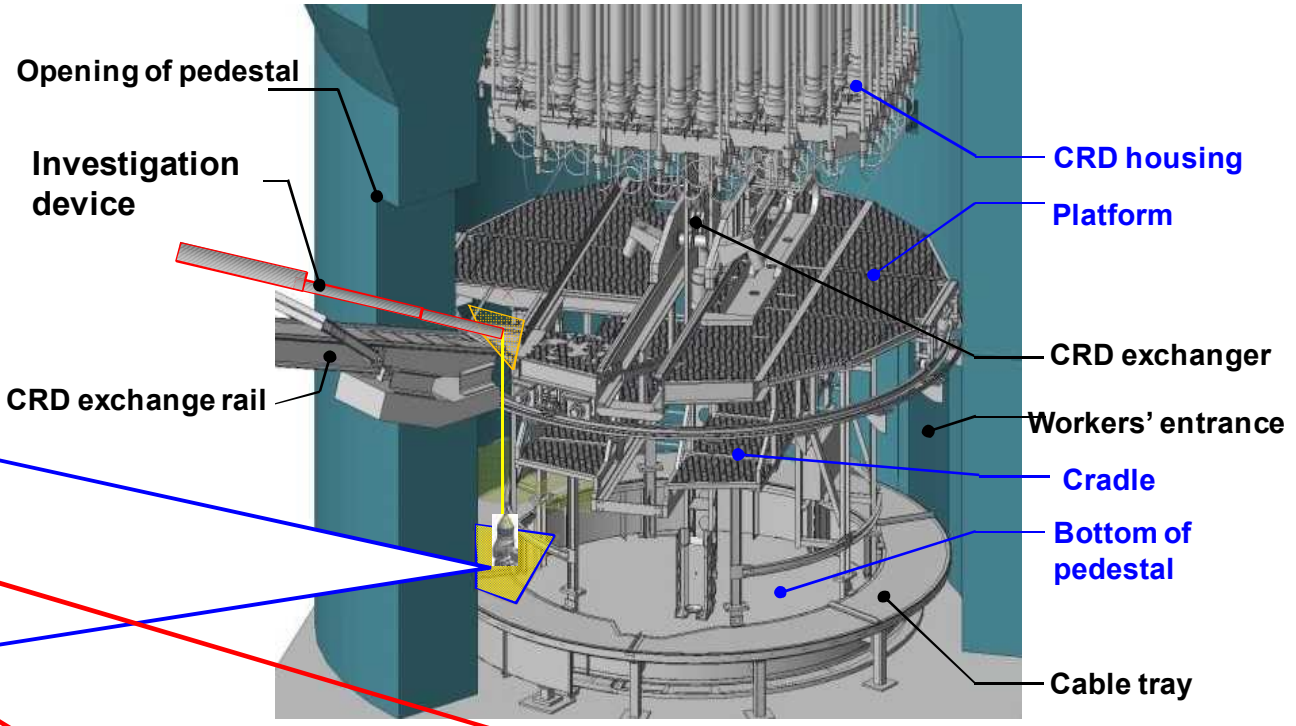


During touching deposits



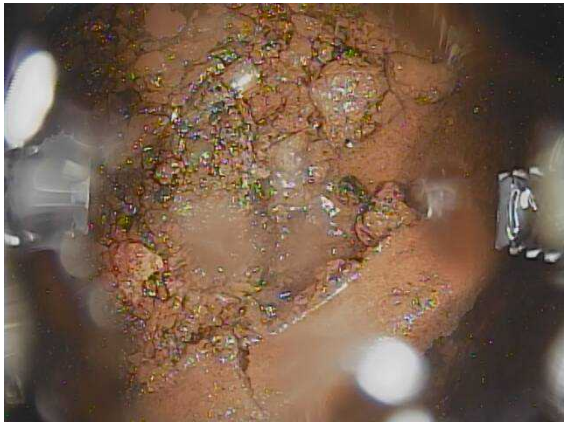
After touching deposits

The Investigation Result (3/3)




Before touching deposits


During touching deposits


After touching deposits

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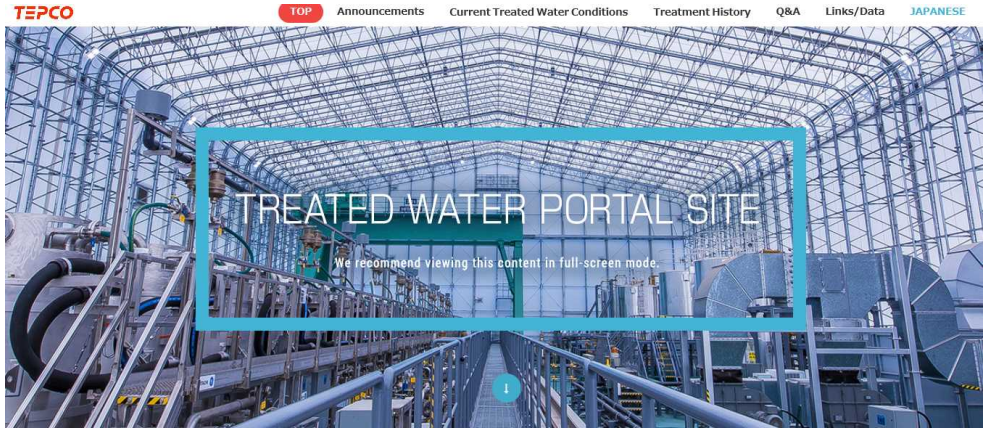
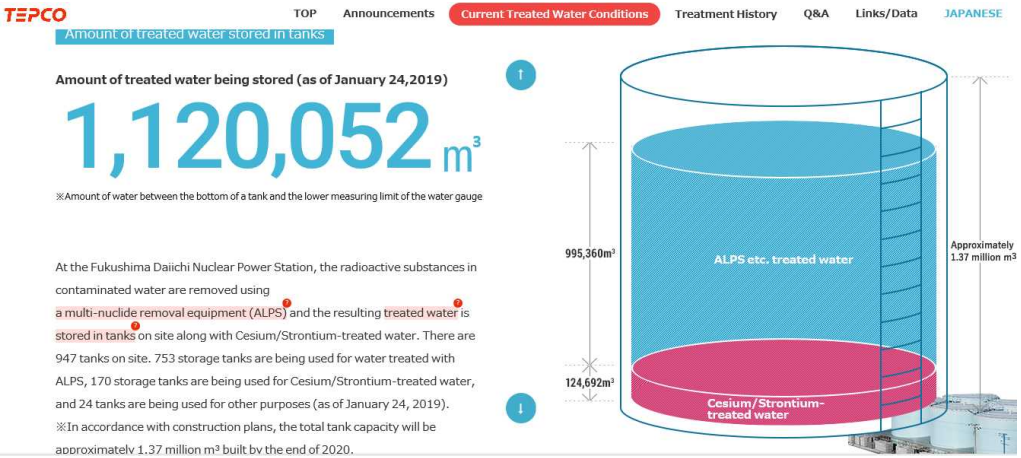
Information Sharing through Contents on TEPCO's Website

"TREATED WATER PORTAL SITE"





Please use this QR code

http://www.tepco.co.jp/decommission/progress/watertreatment/

INSIDE Fukushima Daiichi [Virtual touring of the site]

Please use this QR code

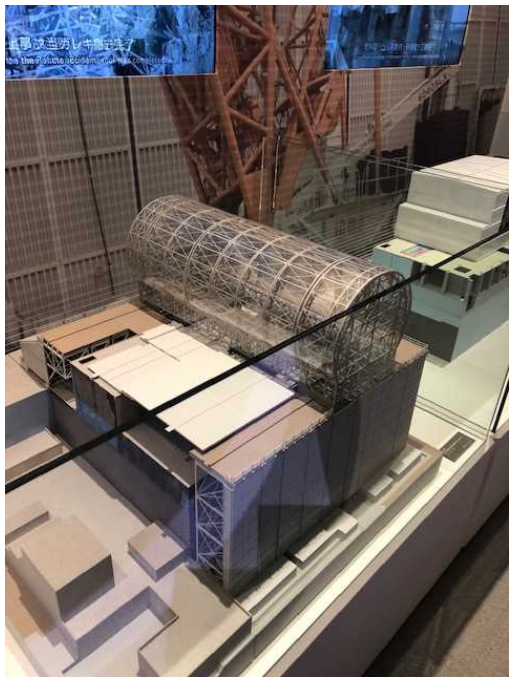
http://www.tepco.co.jp/en/insidefukushimadaiichi/index-e.html

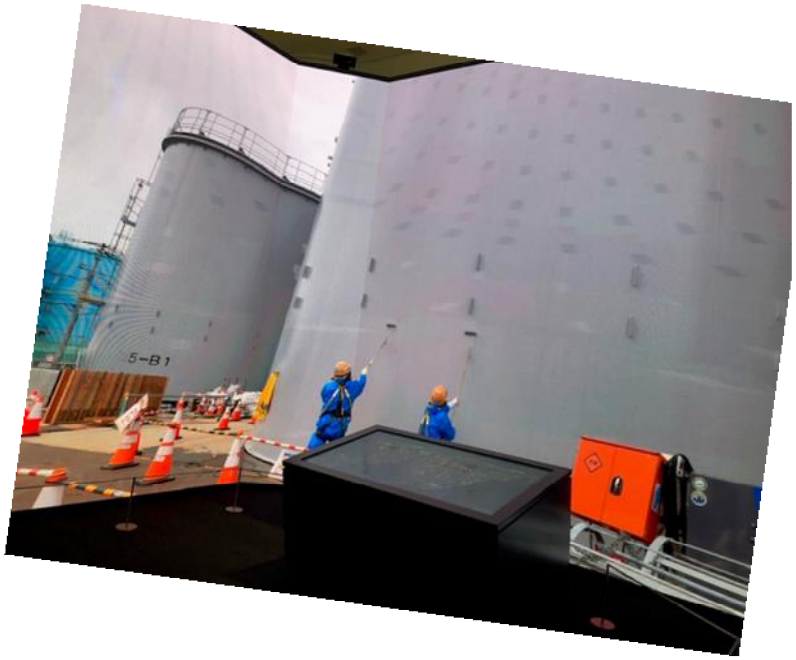
"The current situation at Fukushima Daiichi NPS" -From 3.11 toward the future-

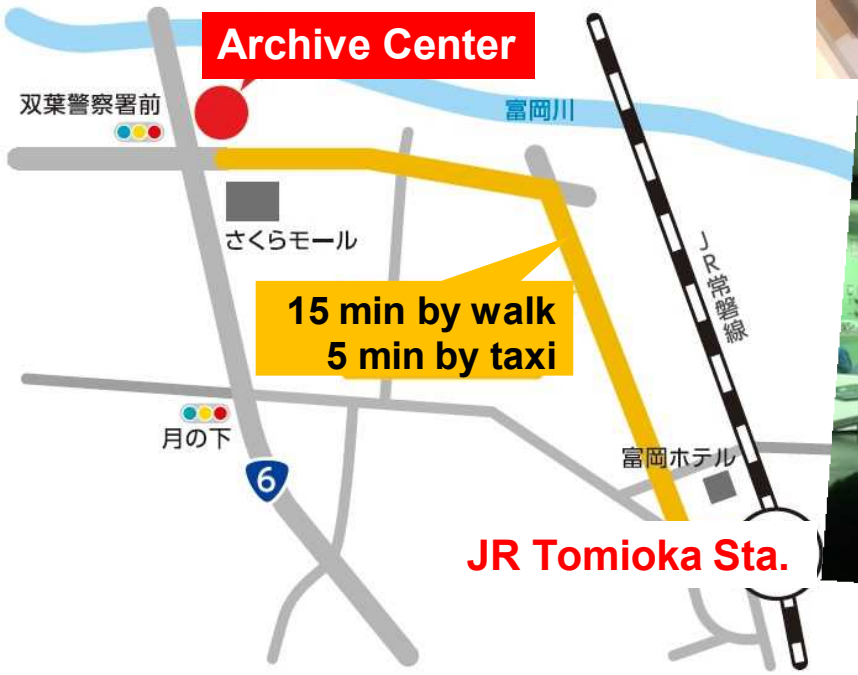
Please use this QR code

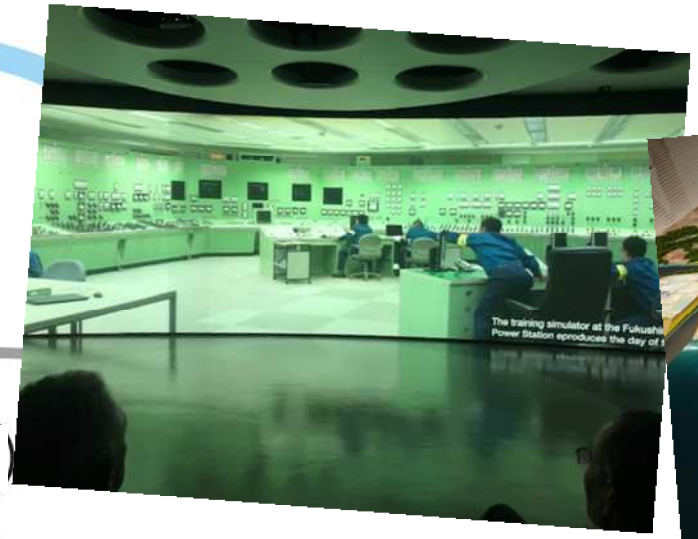
http://www.tepco.co.jp/en/news/library/archive-e.html?video_uuid=r0viqse1&catid=61795&fbclid=IwAR1KVTt6RCPFTqa3pZ3J6IONS-9IPyr__w_PtjODGiOh__lIv48Bncvy6M

Archive Center Opened in Tomioka Town（Nov. 2018）









To the Next Stage

Long-term decommissioning work
with safety, steadiness and without any delay

Current Status

Engaged in the work looking to
the future in a planned manner

Engaged in an emergency crisis mode to
reduce the short-term high risk

- Contaminated Water Management
- Radioactivity Reduction


Thank you for your kind attention
TEPCO