



FPCJ Briefing

Fukushima Daiichi Decontamination and Decommissioning -Current Status and Challenges-

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A photograph of a festival or fair. In the center, there is a large, multi-tiered structure with red and white vertical stripes and a wooden roof. The structure is surrounded by many people, some of whom are wearing traditional Japanese clothing. The ground is a green lawn, and the background shows a blue sky with scattered white clouds and some distant hills or buildings.

Agenda

1. Handling of ALPS Treated Water

2. Work toward Fuel Debris Retrieval

Handling of ALPS Treated Water



Simple overview of water management at Fukushima Daiichi

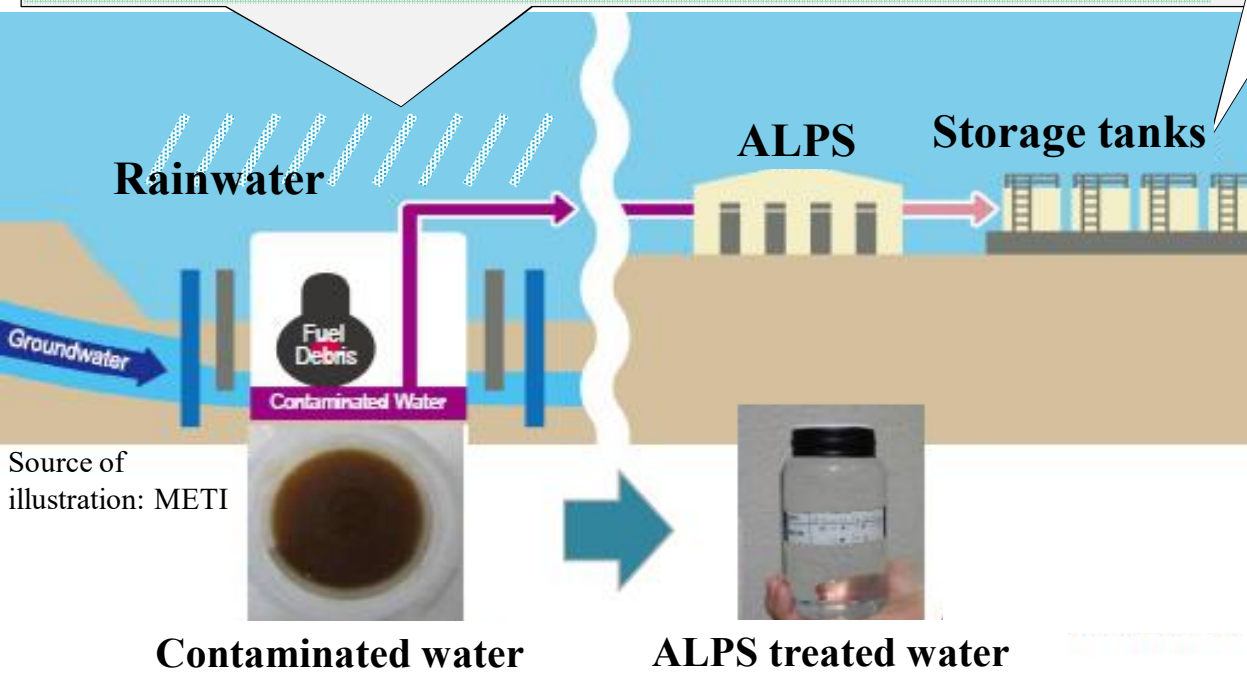
Milestone achieved in 2020

Redirect fresh water from contaminated areas

Contaminated water generation decreased to **less than 150m³/day in 2020** from about 500 m³/day in 2014

Removing the stagnant water

Completed in 2020 except for reactor bldgs. etc.



Source of illustration: METI

Water Storage Status

Volume of water stored in tanks	About 1.29 million m ³ (as of Feb. 2022)
Secured tank volume (1,047 tanks)	About 1.37 million m ³
Generation rate of water stored in tanks	About 130 to 150 m ³ /day



TEPCO's Policy

When discharging ALPS treated water*¹ into the ocean, we shall assess/measure the impact*² on people and the environment based upon safety standards stipulated by Japanese law, international law and international practices, and confirm the safety of such discharges while also ensuring the safety of the public, the surrounding environment, as well as agricultural, forestry and fishery products.

*¹ Water that has been purified with ALPS until the concentration of radioactive materials, with the exception of tritium, falls well below regulatory standards for safety.

*² Including the potential impact on the sea environment



Strengthening and enhancing the scope of monitoring

Expanding/strengthening ocean area monitoring. With the cooperation of agricultural, forest and fishing industry officials and experts, we shall ensure objectivity and transparency.



Preventing leaks from tanks

We shall continually check for leaks from tanks on site, and maintain/manage these tanks in a suitable manner so as to be prepared for natural disasters in the future.



Information dissemination and avoiding adverse impacts on reputation

We shall continue to convey accurate information pertaining to the impact on humans and the environment, and make efforts to protect various industries from reputational damage.

Design and operations for ALPS treated water discharge (blueprint)

Secondary treatment facilities
(reverse osmosis membrane facilities are to be installed for dedicated use)

Secondary treatment facilities (ALPS)

ALPS treated water, etc. tanks

Measurement/confirmation facilities (K4 tank group)

Transfer pump

Seawall

Valves etc.

Header pipe

Seawater flow meter

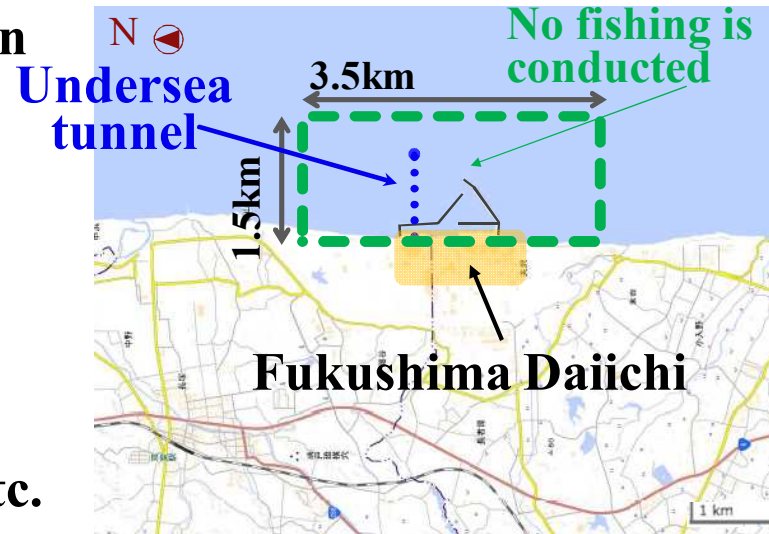
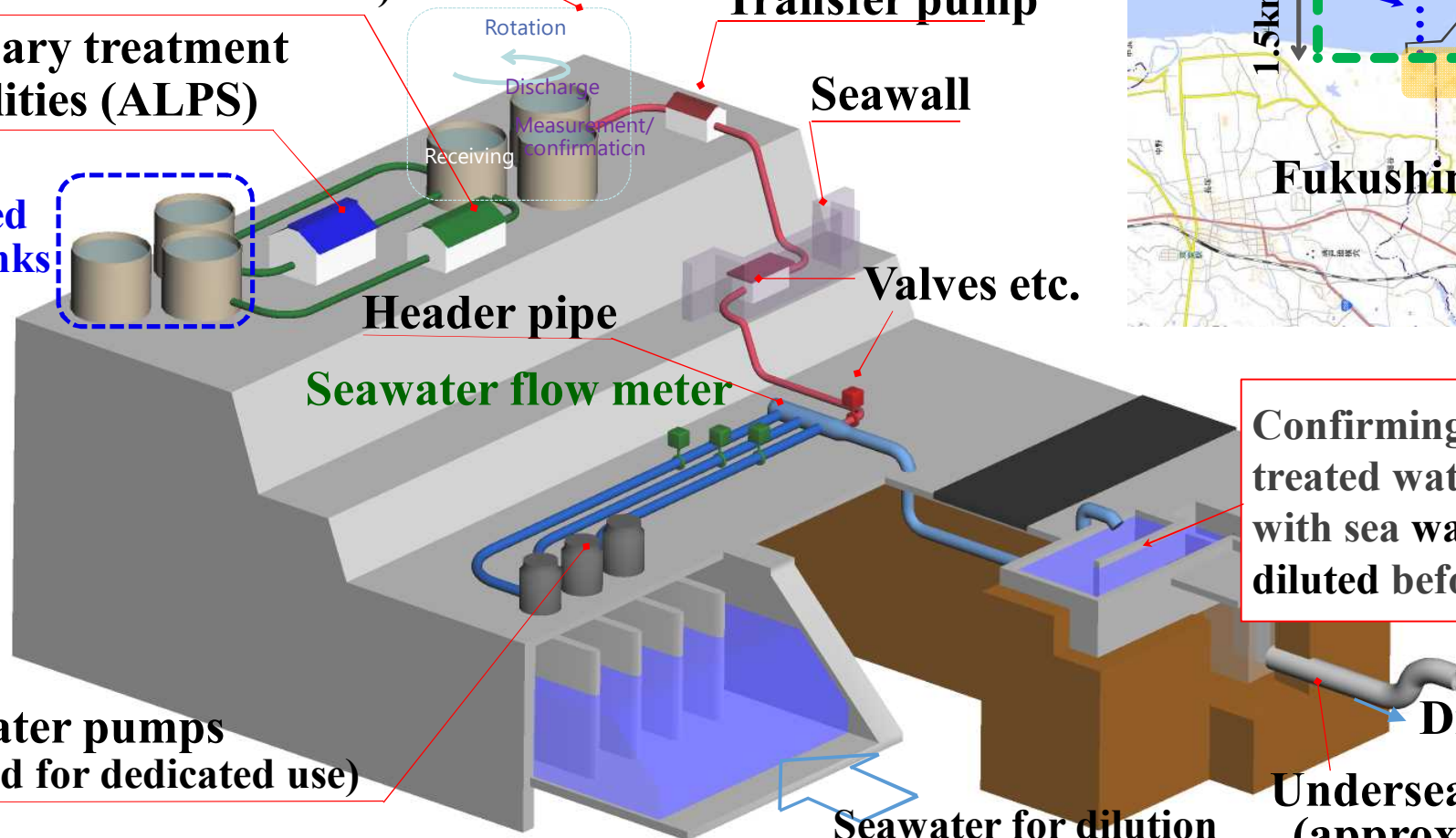
Seawater pumps
(to be installed for dedicated use)

Seawater for dilution

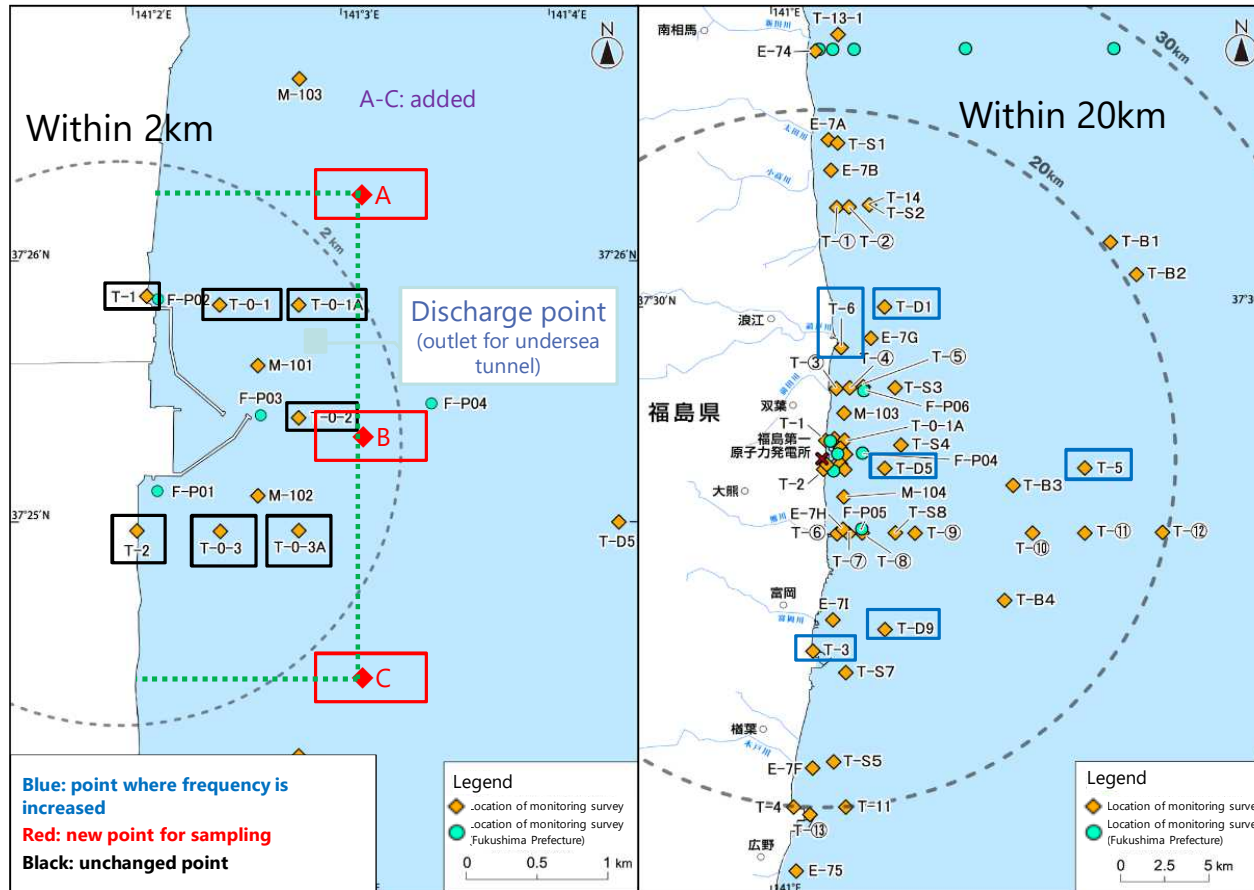
Confirming that ALPS treated water has mixed with sea water and been diluted before discharge

Discharge to sea

Undersea tunnel (approx. 1km)



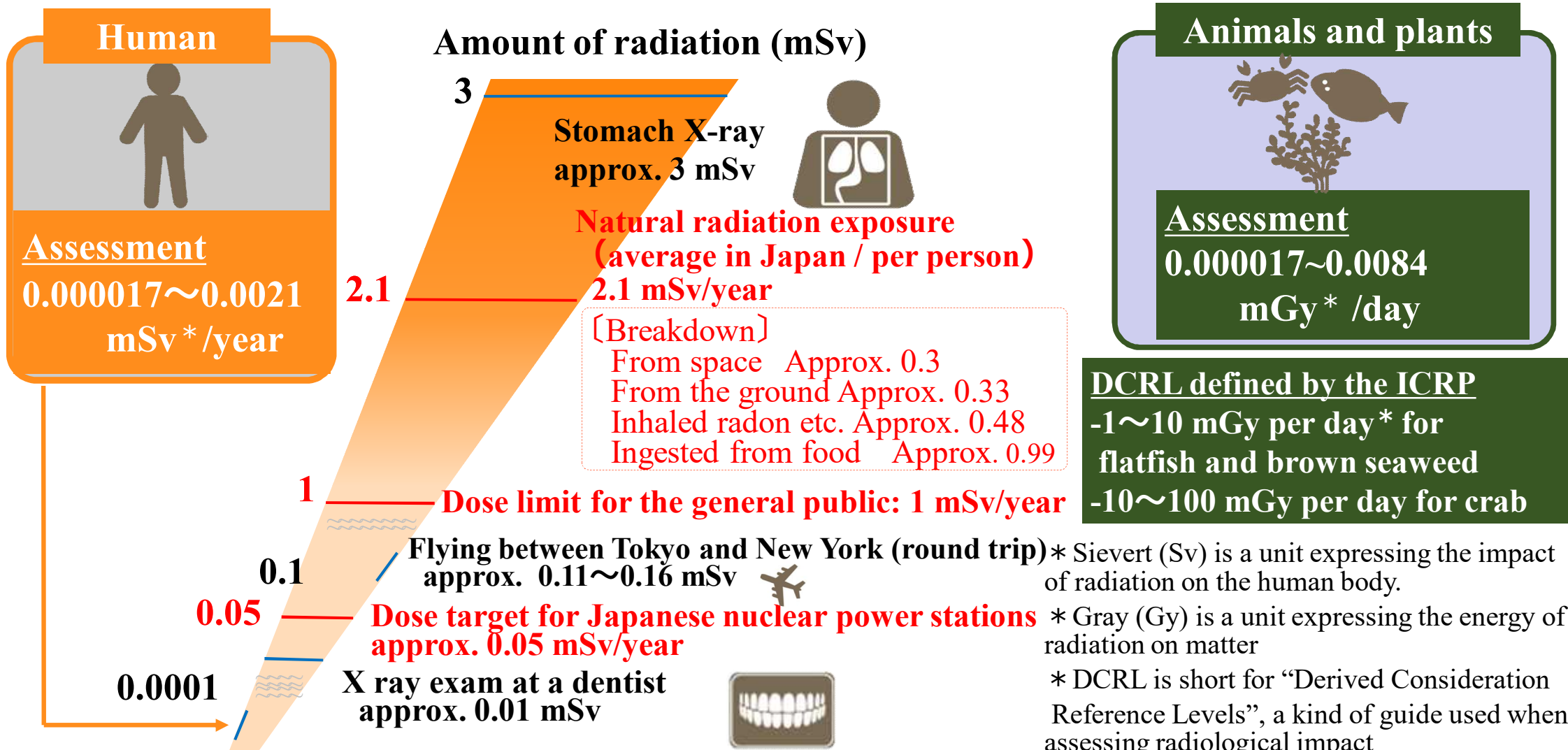
Sea area monitoring for tritium (harbor area & seawater within 20km)



Tritium analysis point outside the harbor (analyze at all points in the harbor)

Area where no fishing is conducted on a daily basis ※
East-West 1.5km North-South 3.5km

The addition of analysis points for sea area monitoring shall be reviewed separately considering the government monitoring coordination meeting



Source: National Institute of Radiological Sciences (Japan)

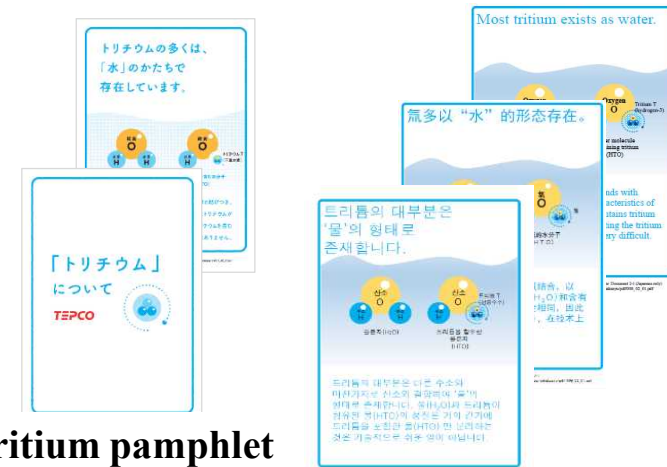
■ Disseminate information based on scientific evidence, and respond to questions and concerns.

● Fostering understanding abroad (coordinate with government)

- Multilingualization of tools to foster understanding
 - Treated water portal site
 - Tritium pamphlet
- Respond to media coverage from abroad
- Providing explanations to embassies etc.



Treated water portal site

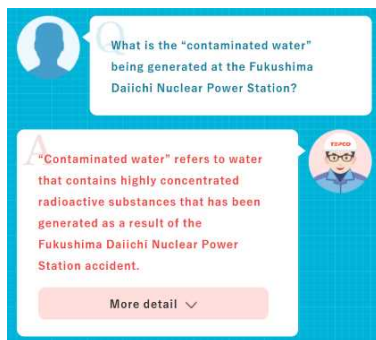


Tritium pamphlet

● Updating the website, "treated water portal site" & using videos and social media

- Further enhance and strengthen the Q&A section to ensure peace of mind in consumers and people abroad.

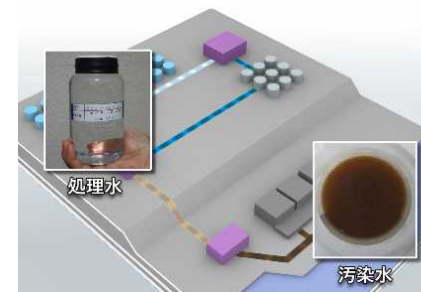
Available in English, Chinese (simplified/traditional) and Korean



Treated water portal site Q&A section



Treated water portal site



Explanatory video (shown at the Decommissioning Archive Center)

A control room environment with several computer monitors. Two workers wearing white hard hats and dark clothing are visible on the left side of the frame. The monitors display various data, including what appears to be a 3D model of a fuel system and other technical diagrams. The text "Work toward Fuel Debris Retrieval" is overlaid in the center of the image.

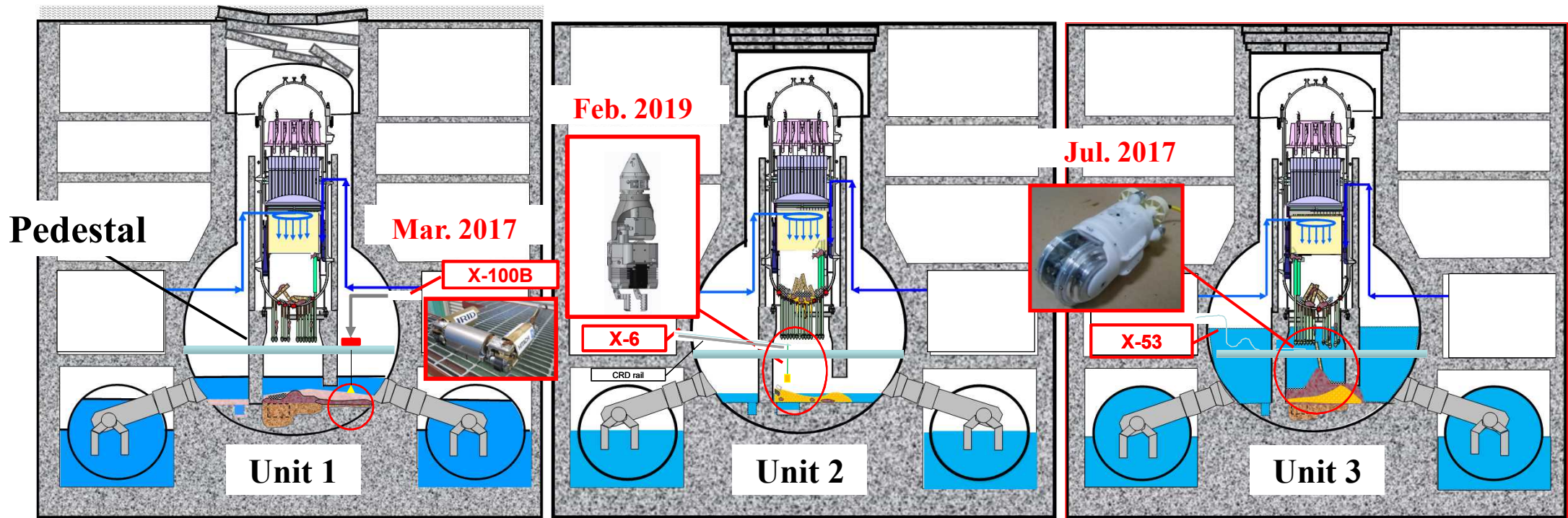
Work toward Fuel Debris Retrieval

TRID has contributed to some work shown here

Robotic exploration

Analysis of accident transient

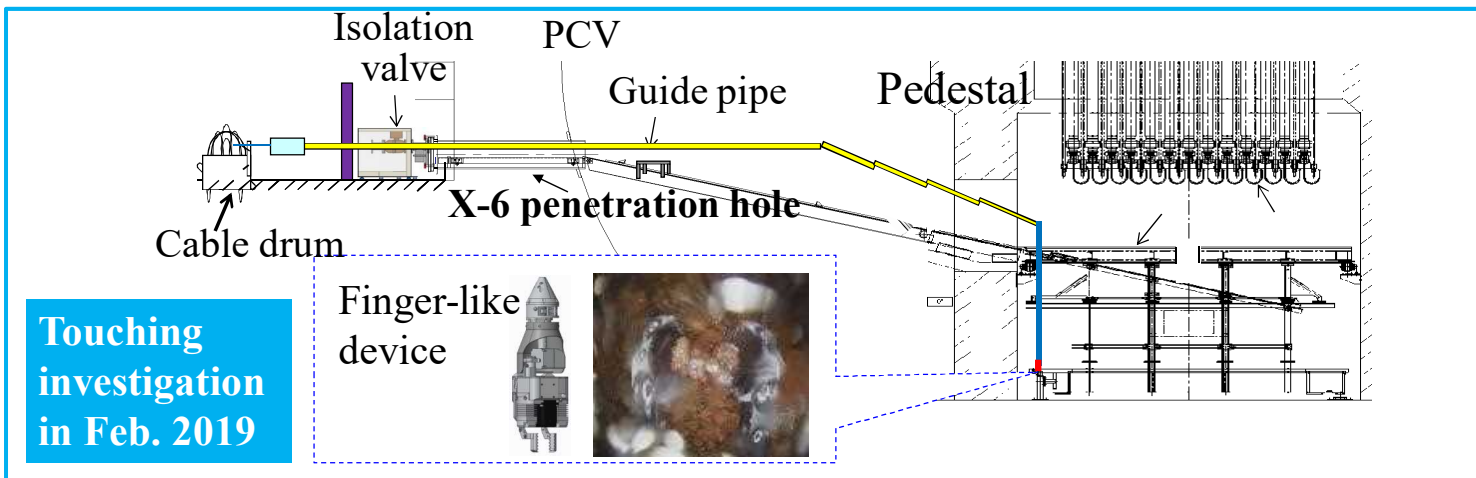
Muon Survey



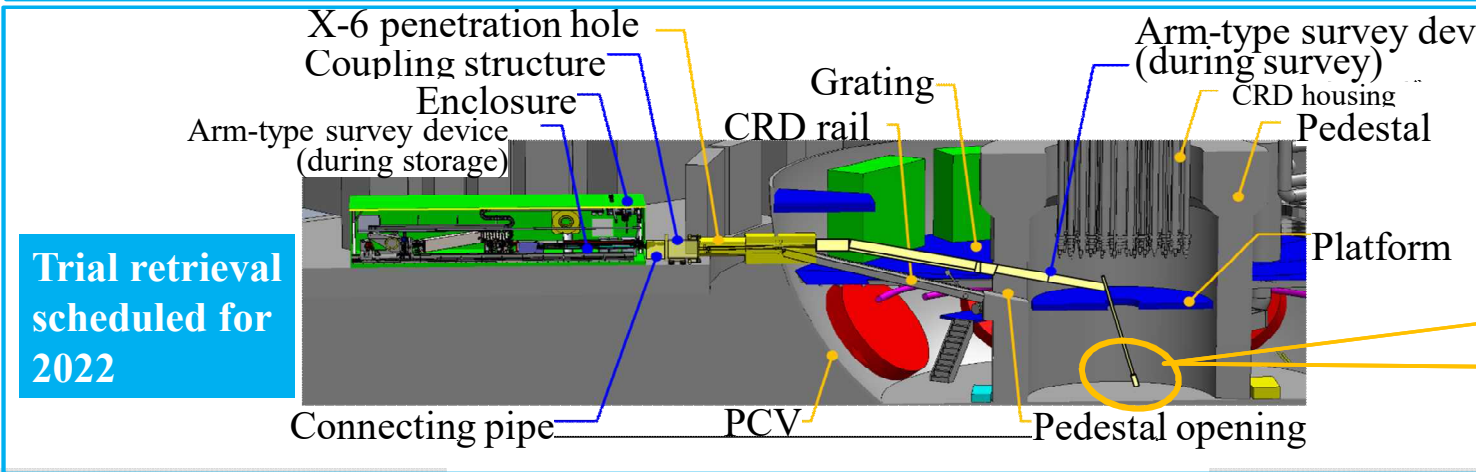
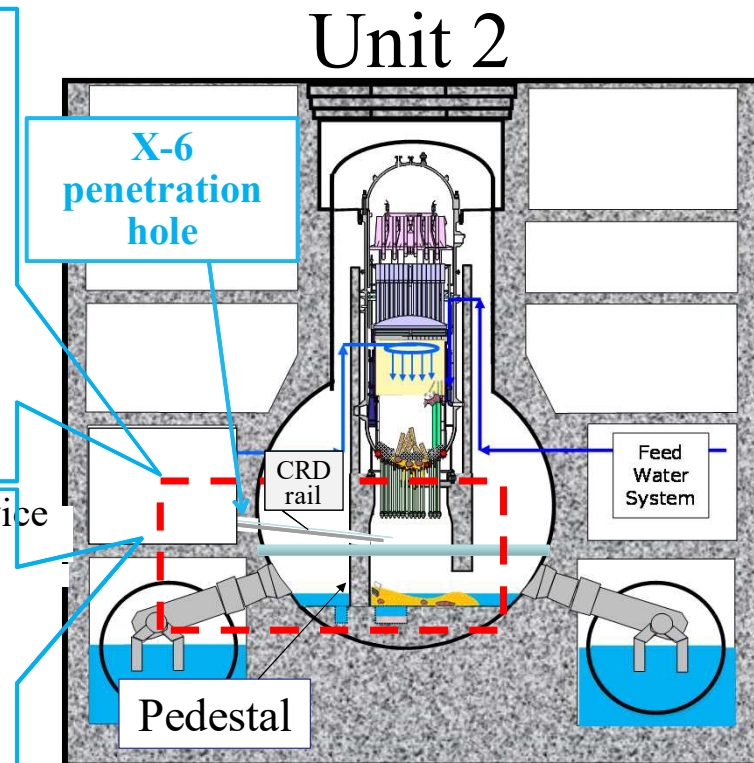
Trial retrieval to start at Unit 2 in 2022

Trial retrieval at Unit 2 scheduled for 2022

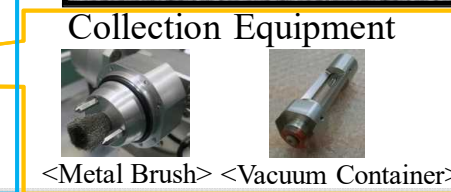
- We will insert an arm-type device through the same access route as the investigation in 2019.
- A metal brush or vacuum container will be attached to the device to collect the grain debris we observed in a touching investigation.



Touching investigation in Feb. 2019



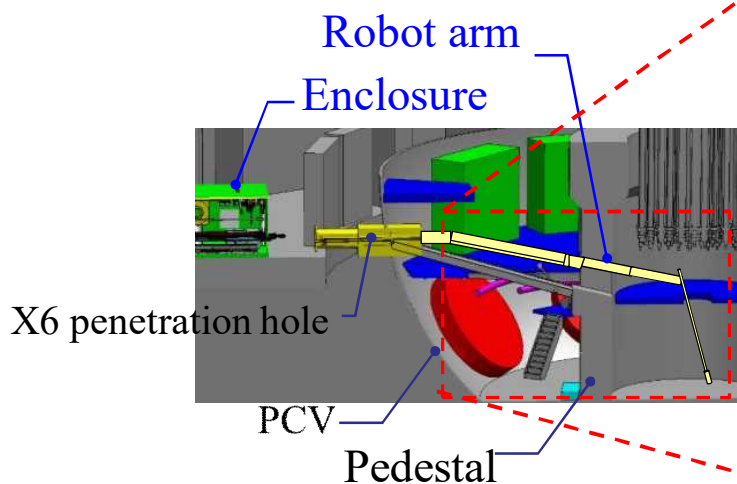
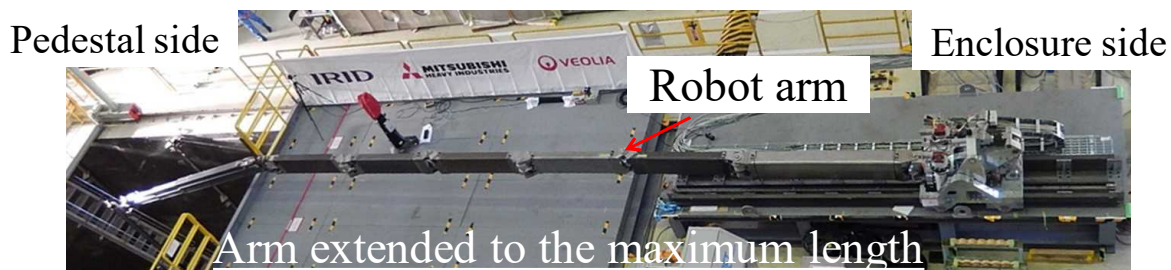
Trial retrieval scheduled for 2022



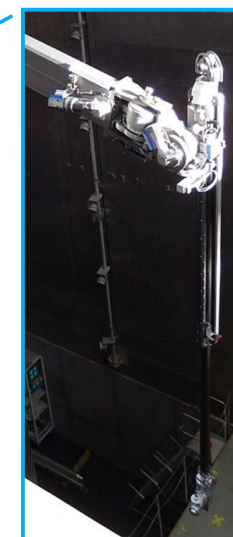
<Metal Brush> <Vacuum Container>

A performance test was conducted in Kobe, involving tasks such as extending the arm to the maximum length.

<Examples of performance test in Kobe, Japan>

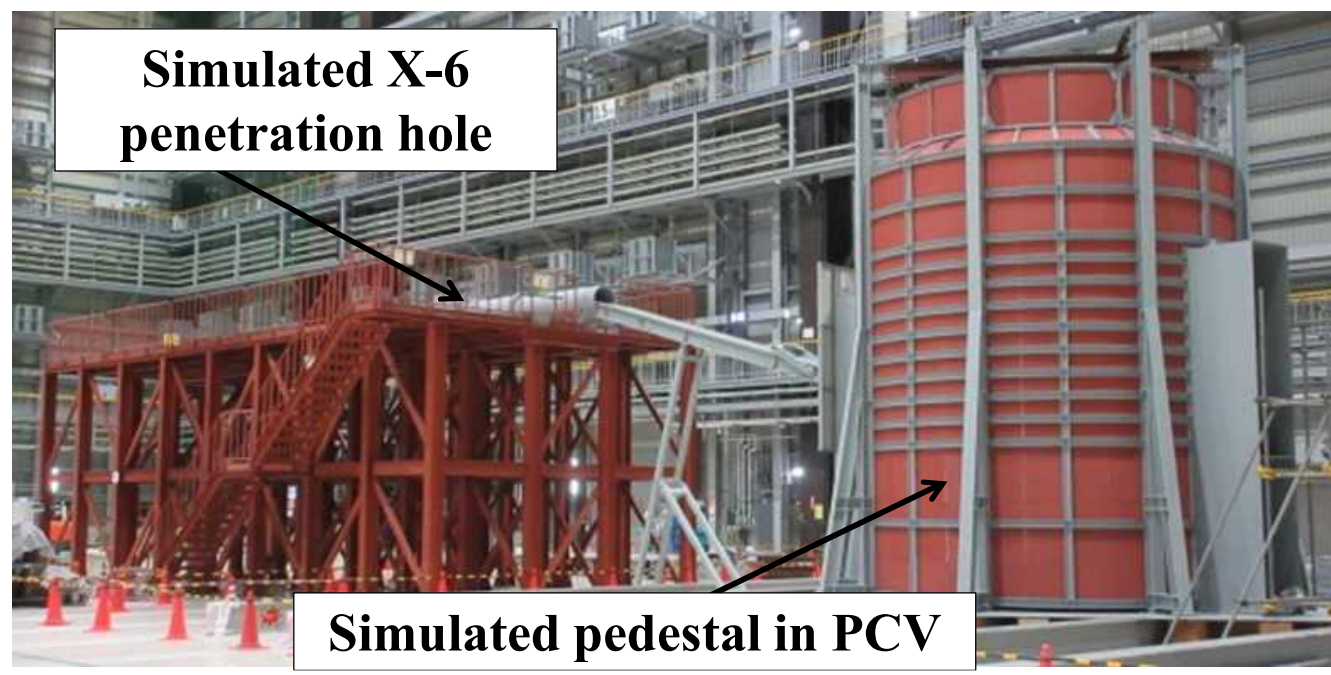


Apical end of the arm

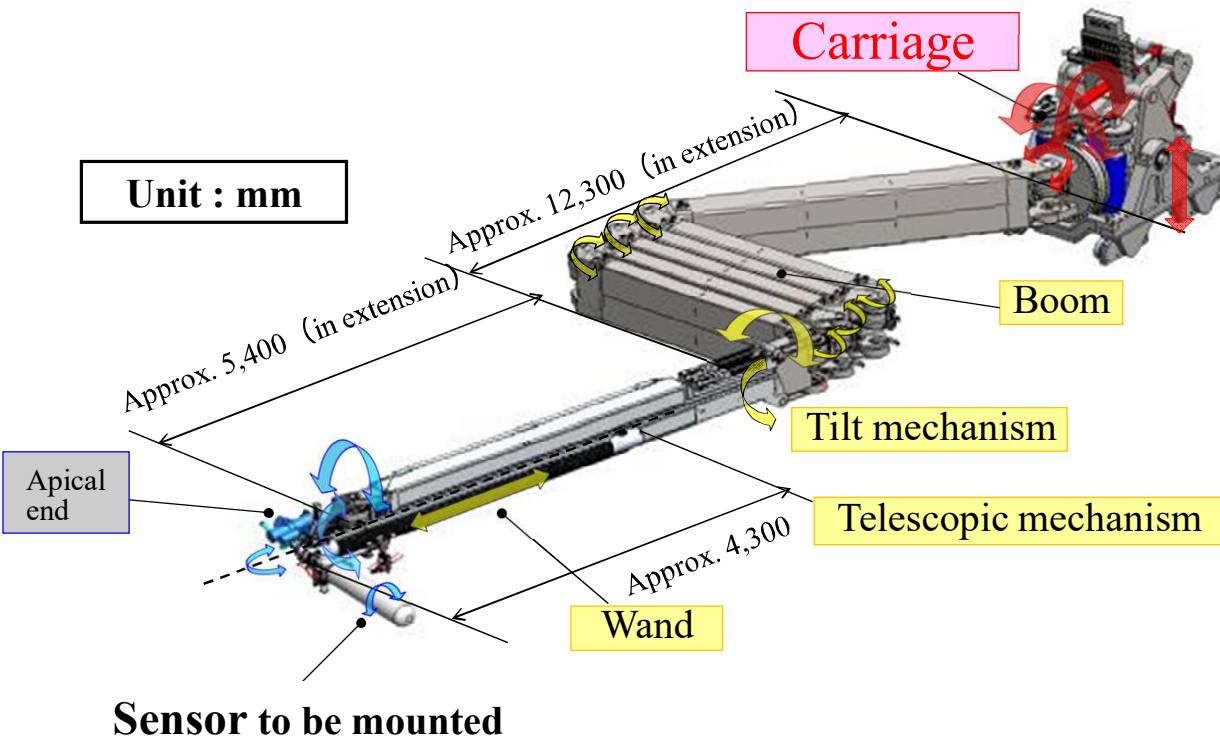


Extending the apical end of the arm

- The equipment was transported to Naraka Center for Remote Control Technology Development set up by JAEA and a performance test etc. at mock-up facilities started on February 14.

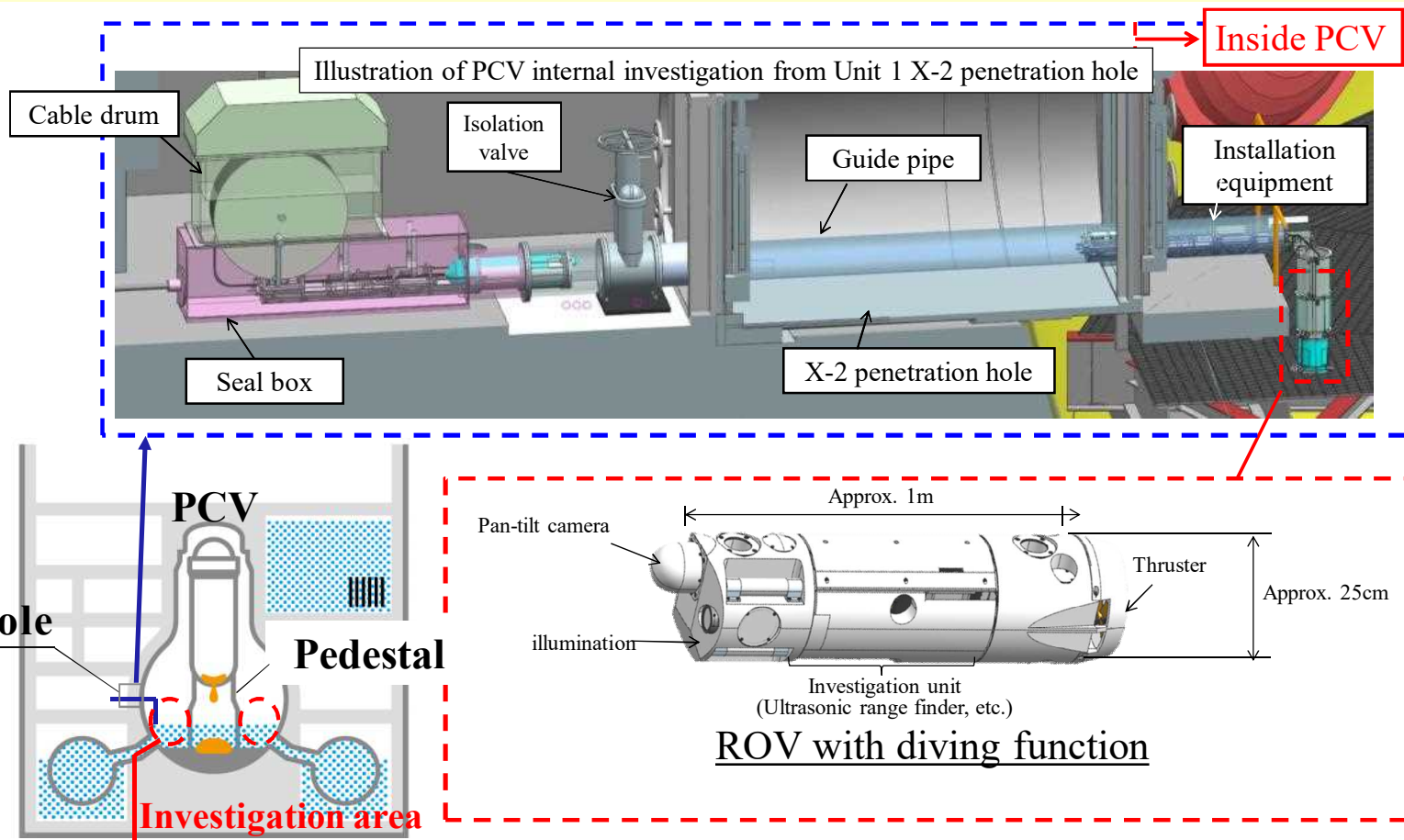
Arrival of the robot arm on Jan. 31**Mock-up facilities**

- We aim to understand the distribution and properties of deposits inside the pedestal as well as the interior structure.
- Measuring equipment and a sampling tool will be attached to the wand.



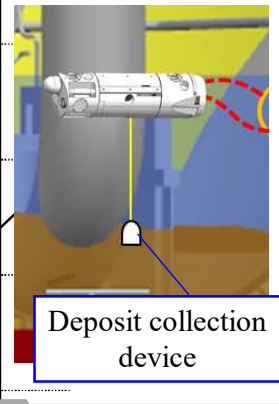
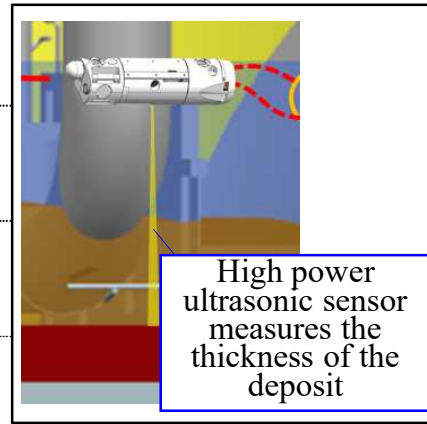
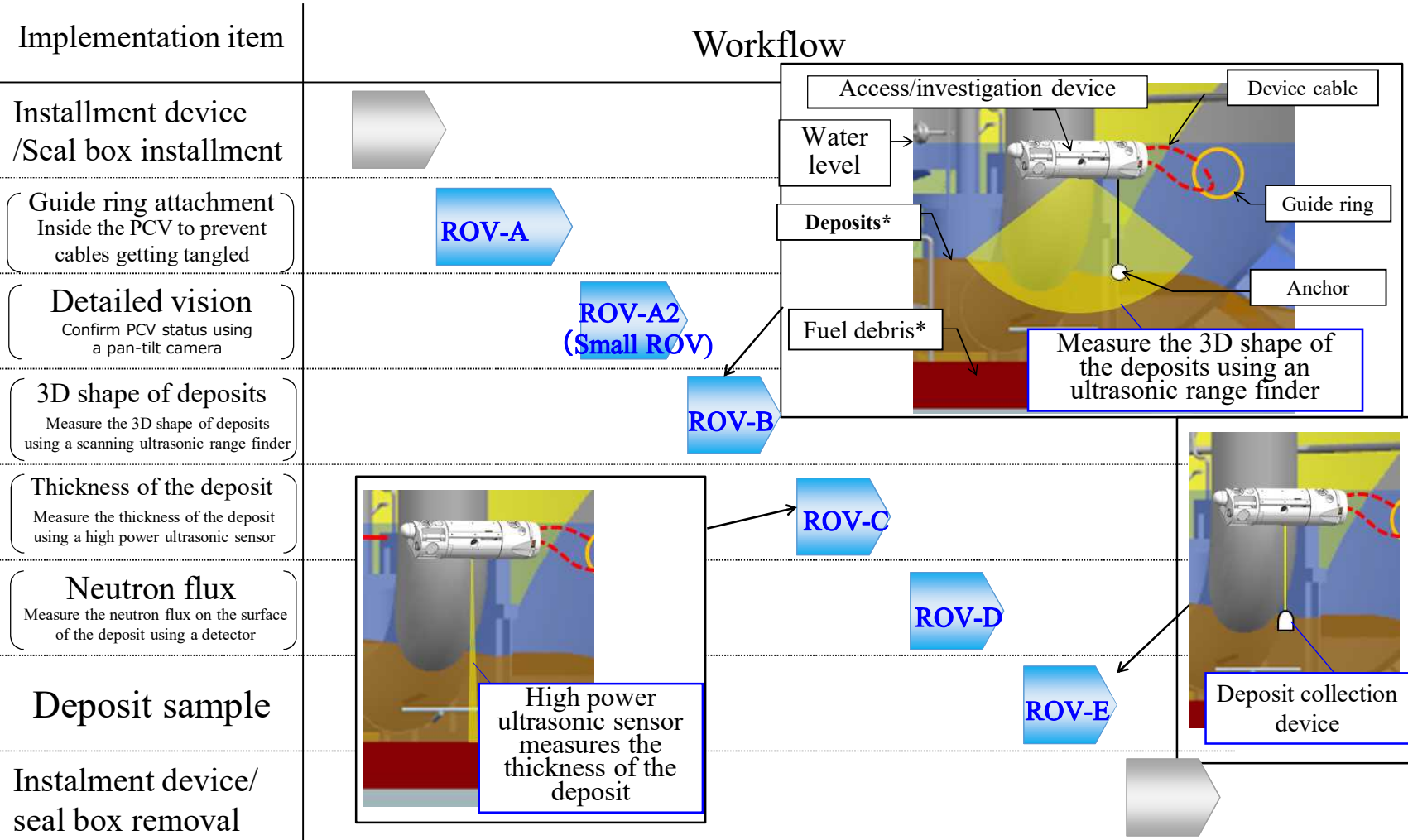
Investigation Item	Measuring devices to be mounted
Detailed vision	Pan-tilt camera
3D rendering	Airborne laser scanning equipment
Gamma ray dose rate	Gamma camera
Neutron flux	Neutron detector

- A ROV with diving function was developed to understand the distribution of deposits mainly outside the pedestal.
- X-2 penetration hole will be used as an access route.



6 types of ROVs have been developed, each with different functions.

Investigation Items (5)

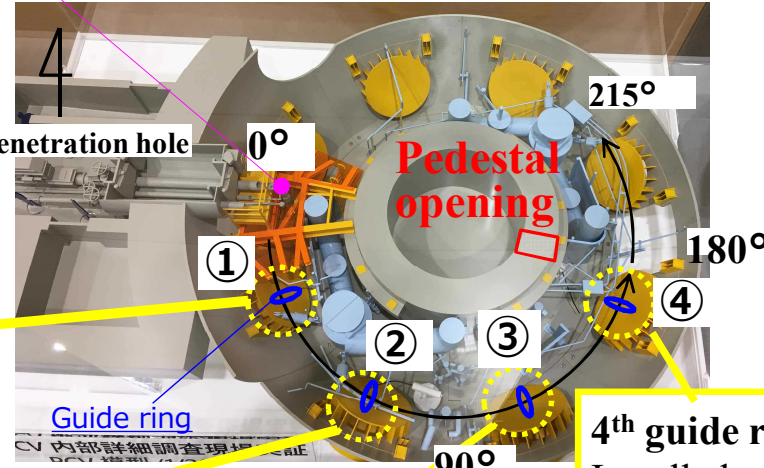


ROV-A tasks accomplished (implemented from February 8 to 10)

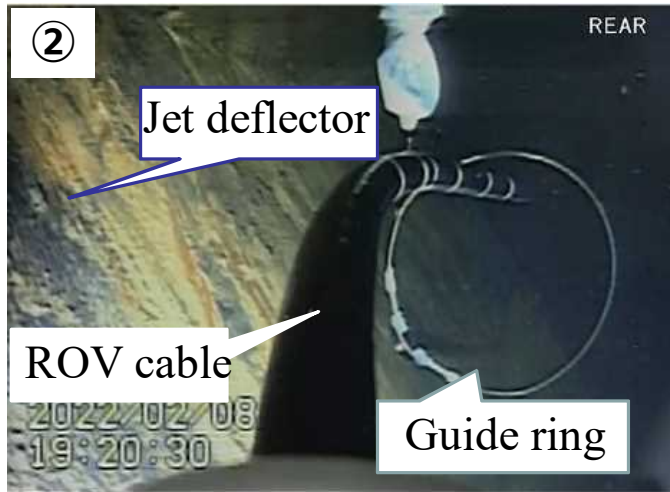
Area where the ROV was submerged



Installed at 6:18 PM on Feb. 8



4th guide ring:
Installed at 1:50 PM on Feb. 9



Installed at 7:49 PM on Feb. 8



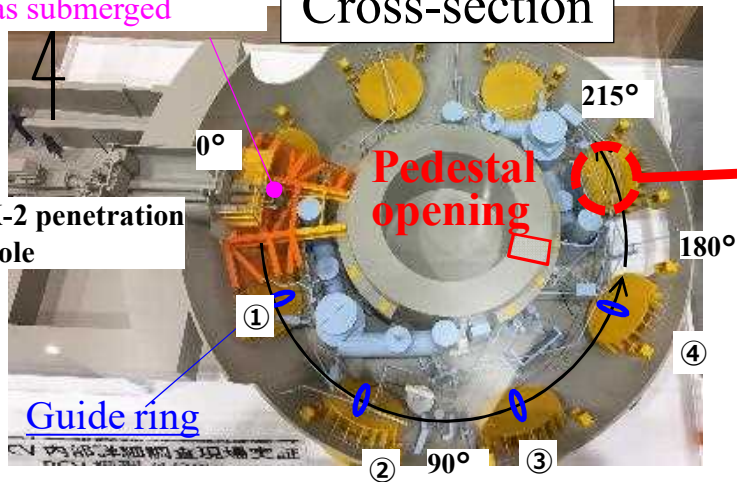
Installed at 9:49 PM on Feb. 8

※ Photos taken on Feb. 8

Deposits observed during the task using ROV-A

Area where the ROV was submerged

Cross-section



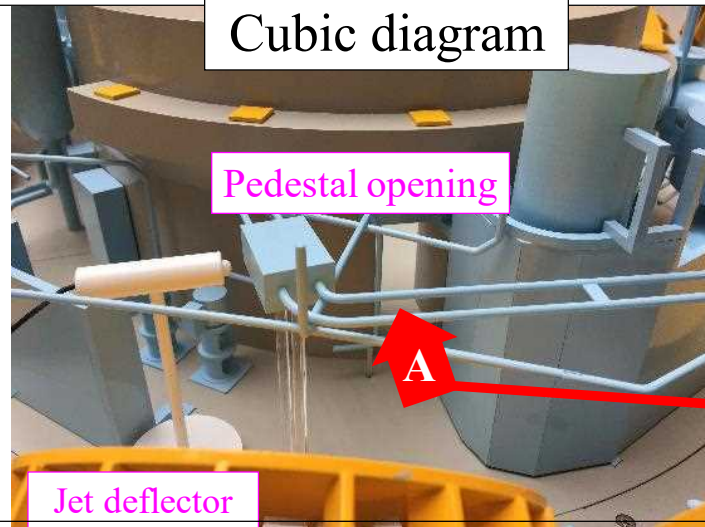
East-northeast



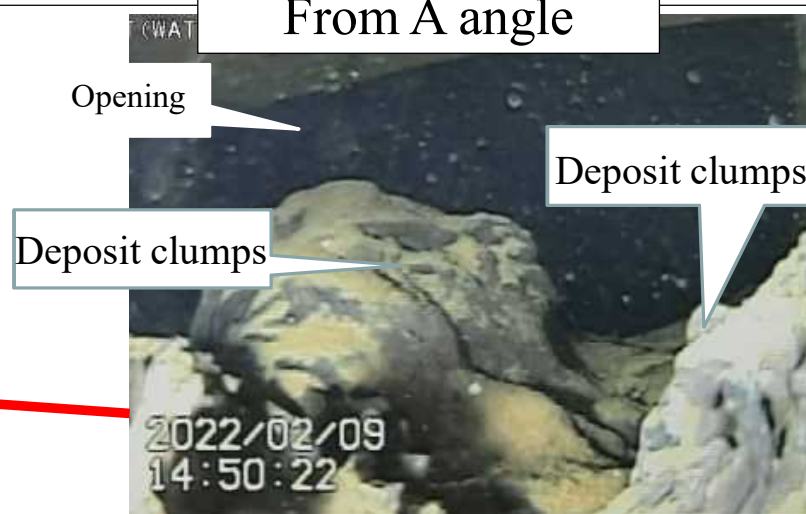
Jet deflector

Materials which look like deposits were found near a jet deflector

Cubic diagram

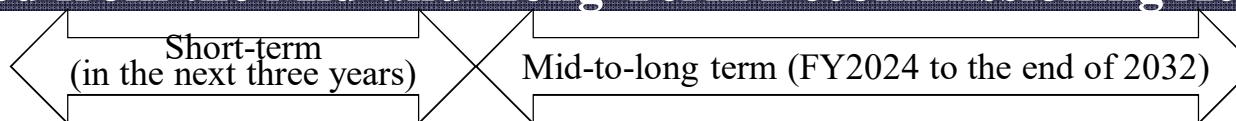


From A angle



Deposit clumps were found near a pedestal opening, although we haven't been able to identify them with the reactor core structure nor the fuel debris.

Future scenario for fuel debris retrieval until 2032 (extracted from the Mid-and-Long-Term Decommissioning Action Plan)



RM Milestones	<p>▽ Start of fuel debris retrieval at Unit 2 rescheduled for 2022 due to the Covid19 pandemic</p>	
Trial Retrieval (Unit 2)	<p>Interior improvement</p> <p>Retrieval equipment arrangement</p>	<p>Trial retrieval and internal investigations</p> <p>Properties analysis</p>
Increasing the scale of retrieval in stages (Unit 2)	<p>Retrieval equipment / Safety systems / Storage facilities / Maintenance equipment</p> <p>Design & Manufacturing</p>	<p>Installation</p> <p>Increasing scale of retrieval</p> <p>Properties Analysis</p>
Further increasing the scale of retrieval (Units 1/3)	<p><Unit 1> Interior & exterior improvement: dose reduction & removing obstacles etc.</p>	
	<p><Unit 3> Interior & exterior improvement: dose reduction, removing obstacles & water level reduction etc.</p>	
	<p>Related facilities: Retrieval equipment / Safety systems / Storage facilities etc.*</p> <p>Conceptual study</p> <p>Verification & development</p> <p>Design</p>	<p>Manufacturing, installation & retrieval</p>

* Assuming that studies will be carried out giving precedence to Unit 3, and Unit 1 will be studied thereafter.

Thank you for your kind attention

TEPCO

