



**Japan's side event in the IAEA General Conference 2021**

# **Fukushima Daiichi Decommissioning 10 years on since the accident**

**September, 2021**

**Akira ONO**

**President**

**Fukushima Daiichi Decontamination and Decommissioning Engineering Company,  
Tokyo Electric Power Company Holdings, Inc.**



## Mask Mandate



## Vaccinations



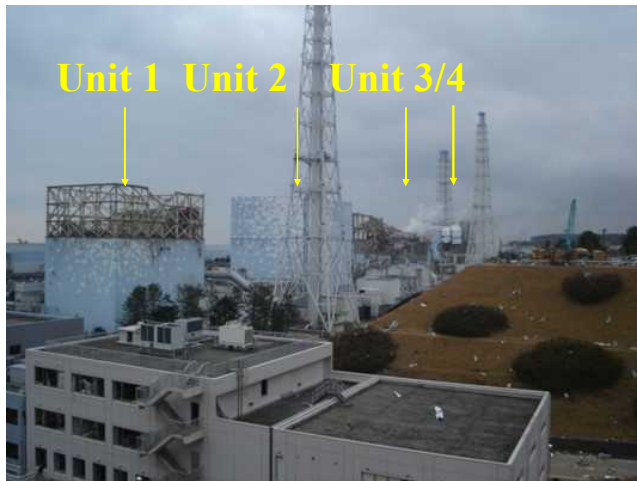
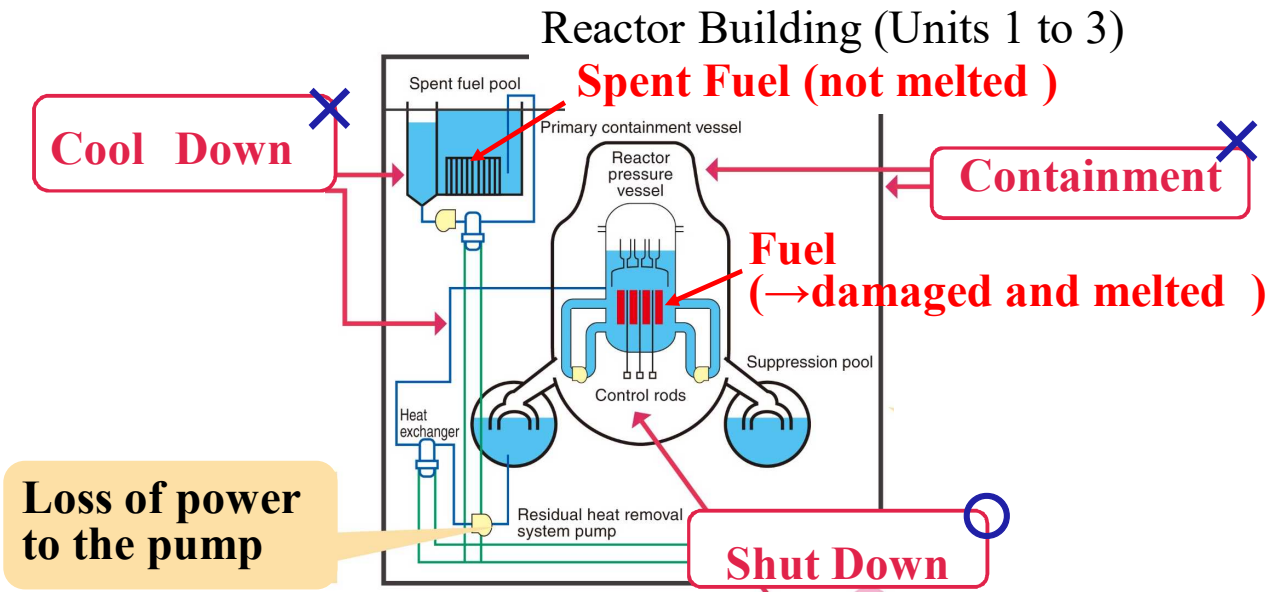


A photograph of a nuclear power plant containment structure. In the foreground, two workers wearing white protective suits and hoods are working on a concrete structure. The background shows the large, complex containment building with various pipes and structural elements. The text "1. History since the Accident" is overlaid in white on the image.

# 1. History since the Accident



# Accident at Units 1 to 4 after tsunami in March 2011



# Major milestones after the accident (1)

Working environment

**March 11, 2011**  
**Occurrence of the Great East Japan Earthquake**

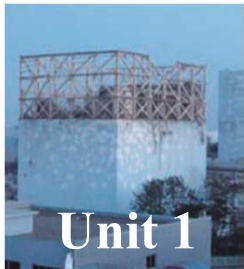
**June 2013**  
**PPE wearing place set up at Fukushima Daiichi**

**May 2015**  
**Completion of the large rest center**



On-site status

**March 2011**  
**Hydrogen explosion at Units 1, 3 and 4**



**December 2014**  
**Completion of fuel removal at Unit 4**



**May 2015**  
**Treatment of highly contaminated water in tanks substantially completed**

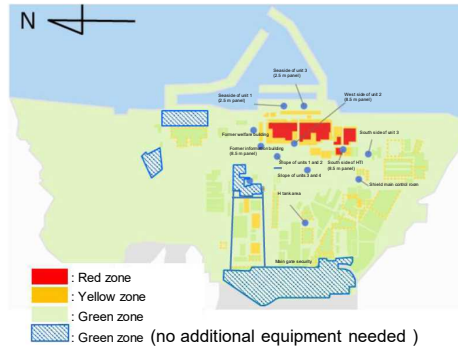


# Major milestones after the accident (2)

Working environment



**October 2016**  
Completion of administrative building



**May 2018** G-zone expanded to 96% of the premises

**April 2019**

Start of Unit 3 fuel removal



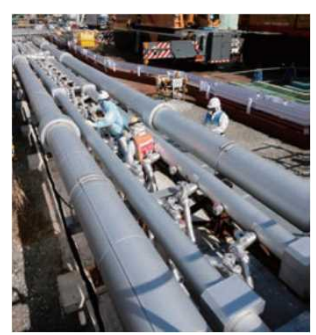
< since FY2020 >  
Project-oriented approach based on “Mid-and-Long-Term Decommissioning Action plan”

On-site status

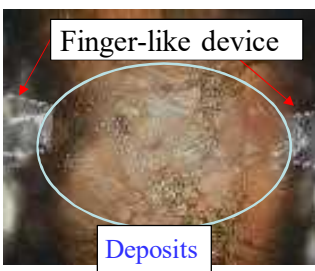
**October 2015**  
Completion of sea-side impermeable wall



**March 2018**  
Frozen soil wall (Ice Wall) completed in most of the areas



**February 2019**  
Touching investigation of deposits in Unit 2 PCV



**March 2019**

Regarding treated water storage, transition to reliable welded tanks completed





## 2. Latest Developments





# Water Management

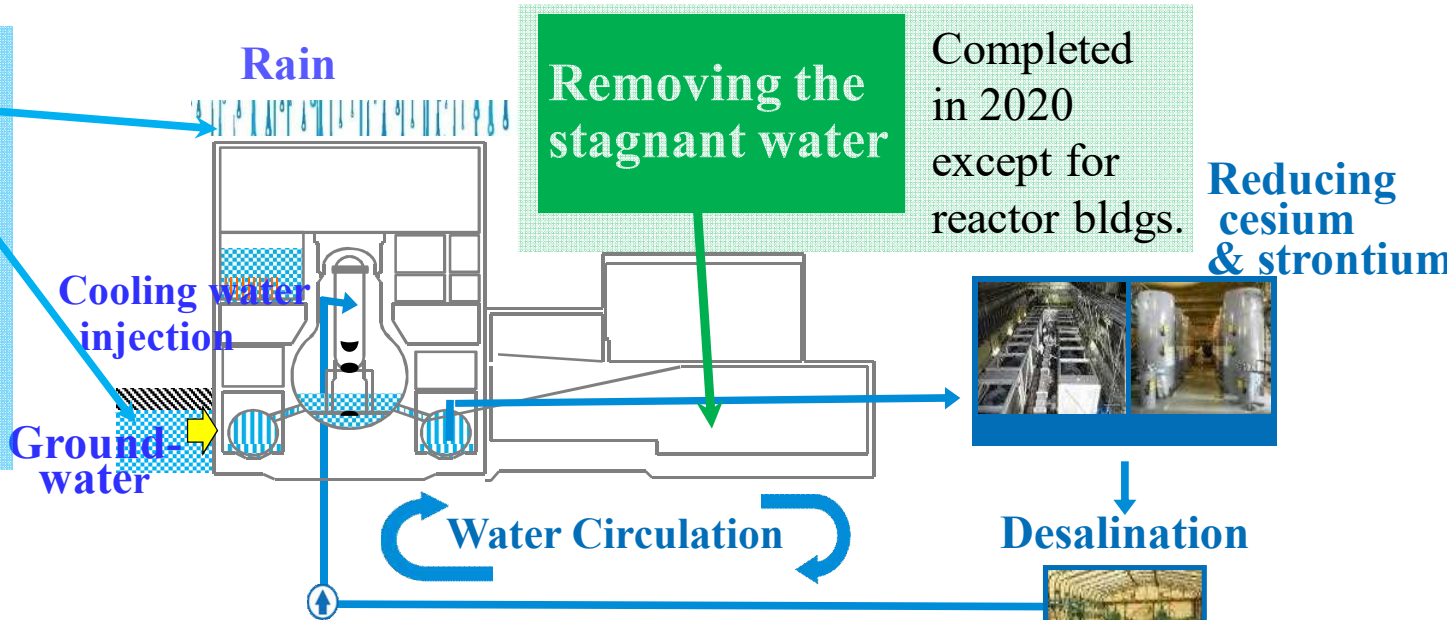
An aerial photograph of a large-scale water management facility, likely a water treatment plant. The foreground and middle ground are dominated by a dense array of large, circular, light-colored concrete or metal tanks. In the background, several tall, red construction cranes are visible against a clear blue sky, indicating ongoing development or maintenance work. The overall scene is industrial and organized.



# Major issues surrounding water stored at Fukushima Daiichi

**Redirect fresh water from contaminated areas**

Contaminated water generation decreased to **less than 150m<sup>3</sup>/day in 2020** from about 500 m<sup>3</sup>/day in 2014



**Storage of ALPS-treated water : preparations for discharge into the sea underway**



**ALPS**

Capable of removing 62 kinds of nuclides, other than tritium

**Strontium-reduced water (Cesium & Strontium reduced)**



# 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.**

**Seawater flow meter**

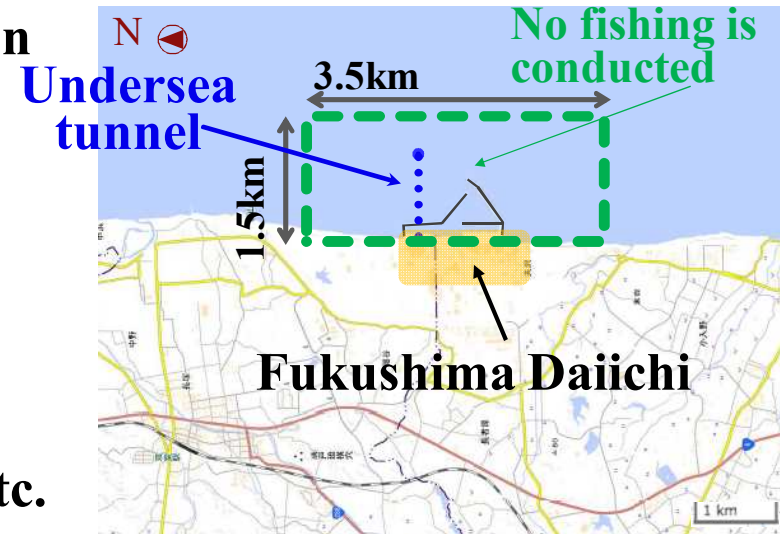
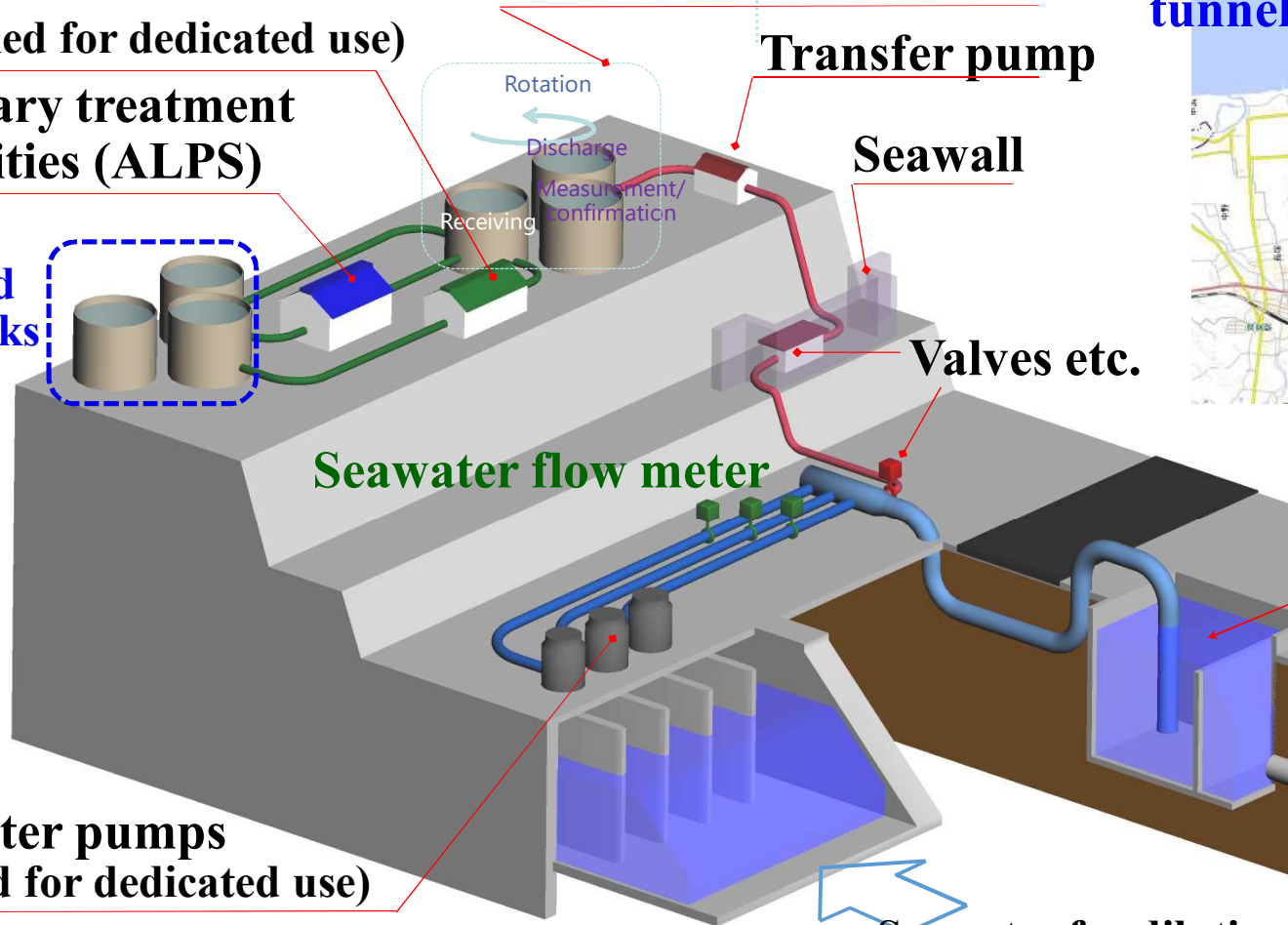
**Seawater pumps**  
(to be installed for dedicated use)

**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)**







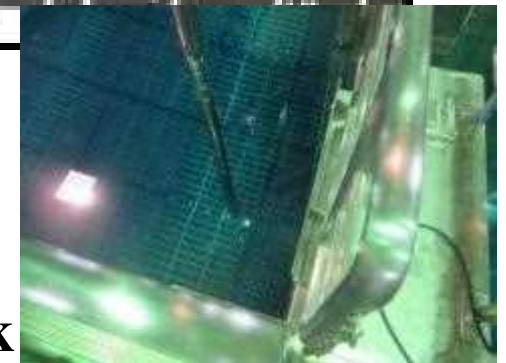
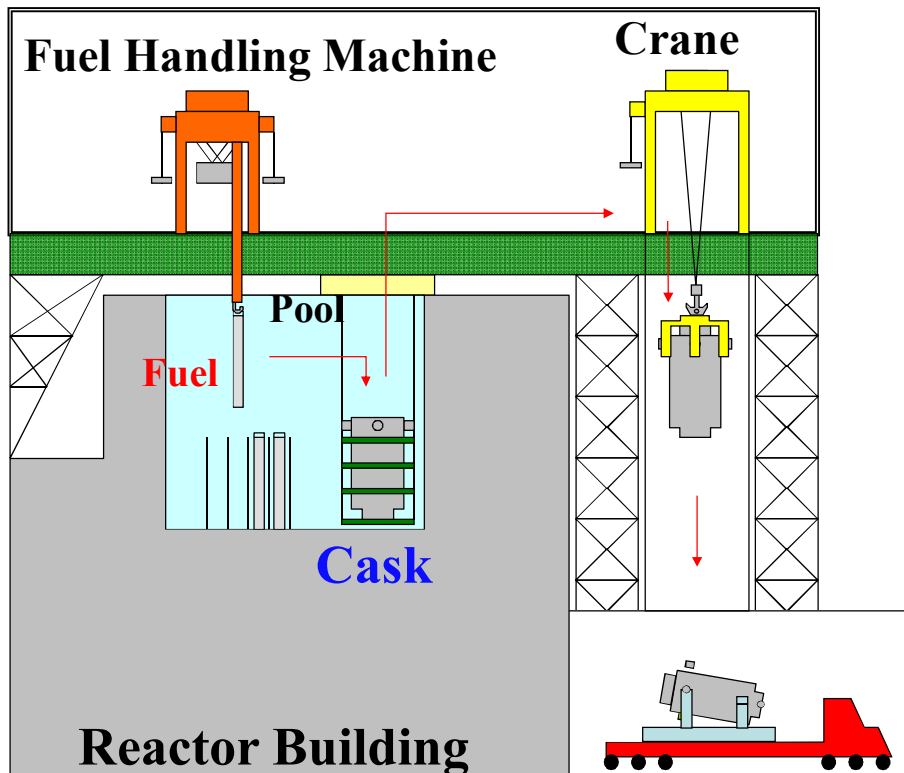
# Fuel Removal from Spent Fuel Pools



# What is spent fuel removal?

- After loading onto the fuel transfer cask, spent fuel is transported to the on-site common pool and stored in the fuel rack.

## Common pool



Site transfer  
  
 Store in fuel rack



# Completion of fuel removal at Unit 3 (Feb. 28, 2021)

- Since the upper part of the building was highly radioactive, most work including rubble removal and fuel removal was carried out via remote operation.
- Lessons and knowledge obtained from the work will be used in the removal at Units 1 & 2 and other projects.

## Rubble removal & Decontamination (from 2012 to 2016)

- Removal of rubble on the refueling floor
- Removal of rubble in the spent fuel pool
- Decontamination on the refueling floor
- Shielding on the refueling floor

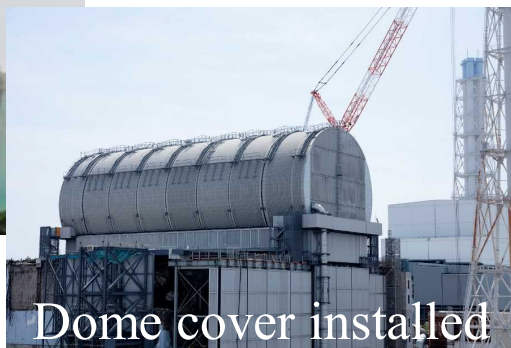
## Installation of fuel removal equipment (from 2017 to 2018)

- Fuel handling machine
- Dome cover

## Fuel removal (from 2019 to 2021)

## Storage / Transfer

### Renovation of Unit 3



### Transfer of the last fuel assembly from Unit 3





A control room with three operators at computer workstations. The operators are wearing white shirts and are seated at desks with multiple monitors. The room has a blue-tinted background. The text "Work toward Fuel Debris Retrieval" is overlaid in the center.

# Work toward Fuel Debris Retrieval

IRID has contributed to some work shown here

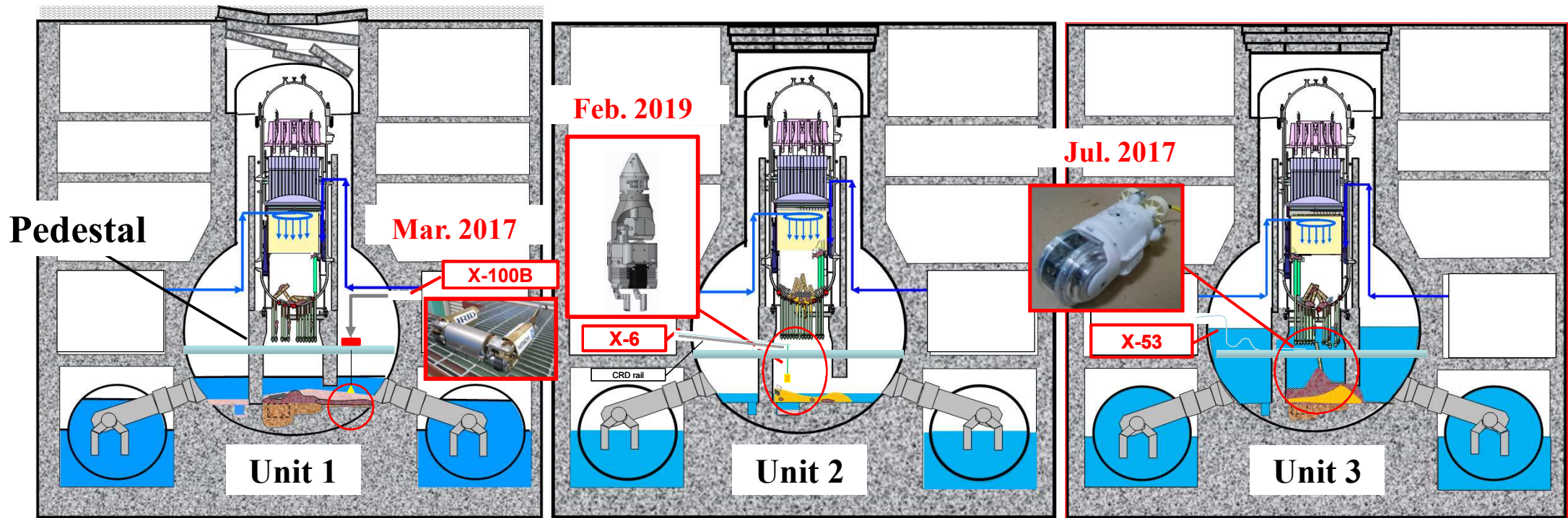


# Assumed distribution of fuel debris

Robotic exploration

Analysis of accident transient

Muon Survey

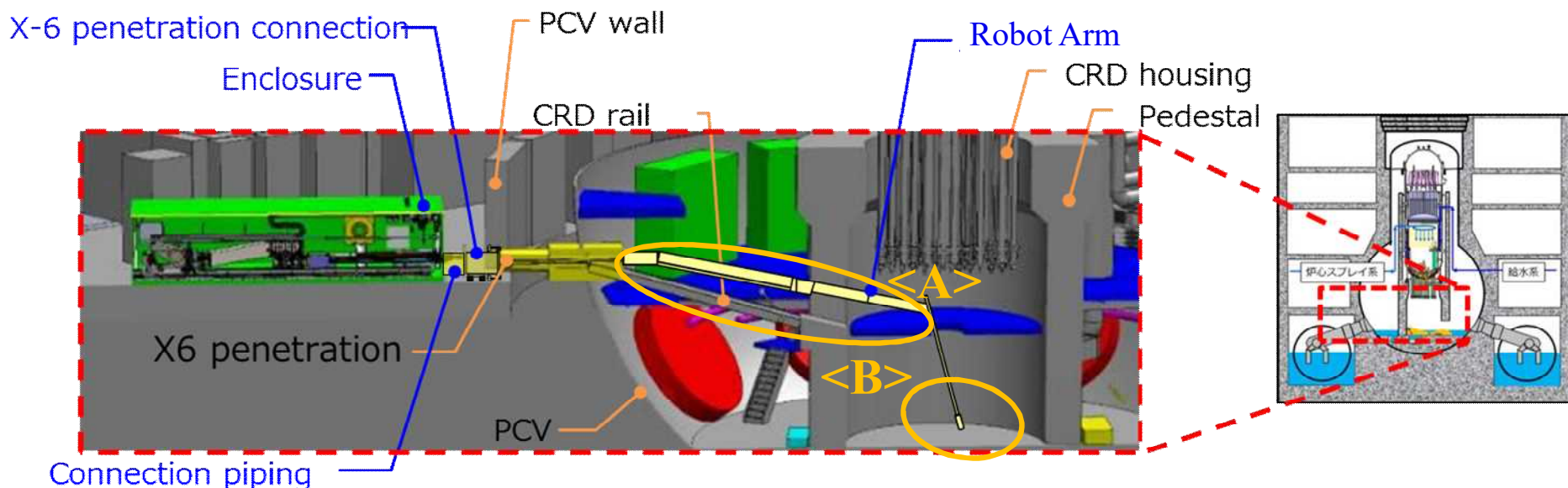


Trial retrieval to start at Unit 2 in 2022

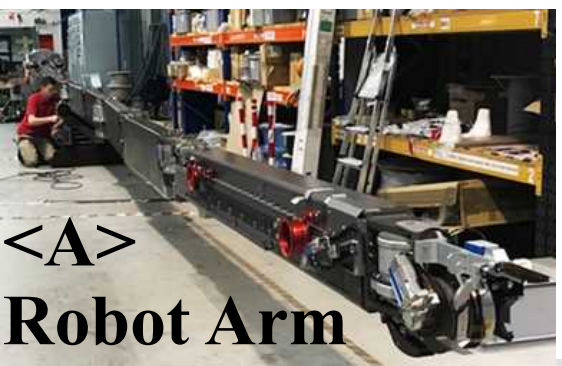


# Equipment to be used for fuel debris retrieval at Unit 2

- The first trial retrieval to be rescheduled for FY2022 due to the coronavirus in the U.K.
- Stepwise expansion of the retrieval scale to follow after the first trial.



## <B> Collection Equipment





# The equipment's arrival in Japan

at Kansai International Airport (Jul. 10)

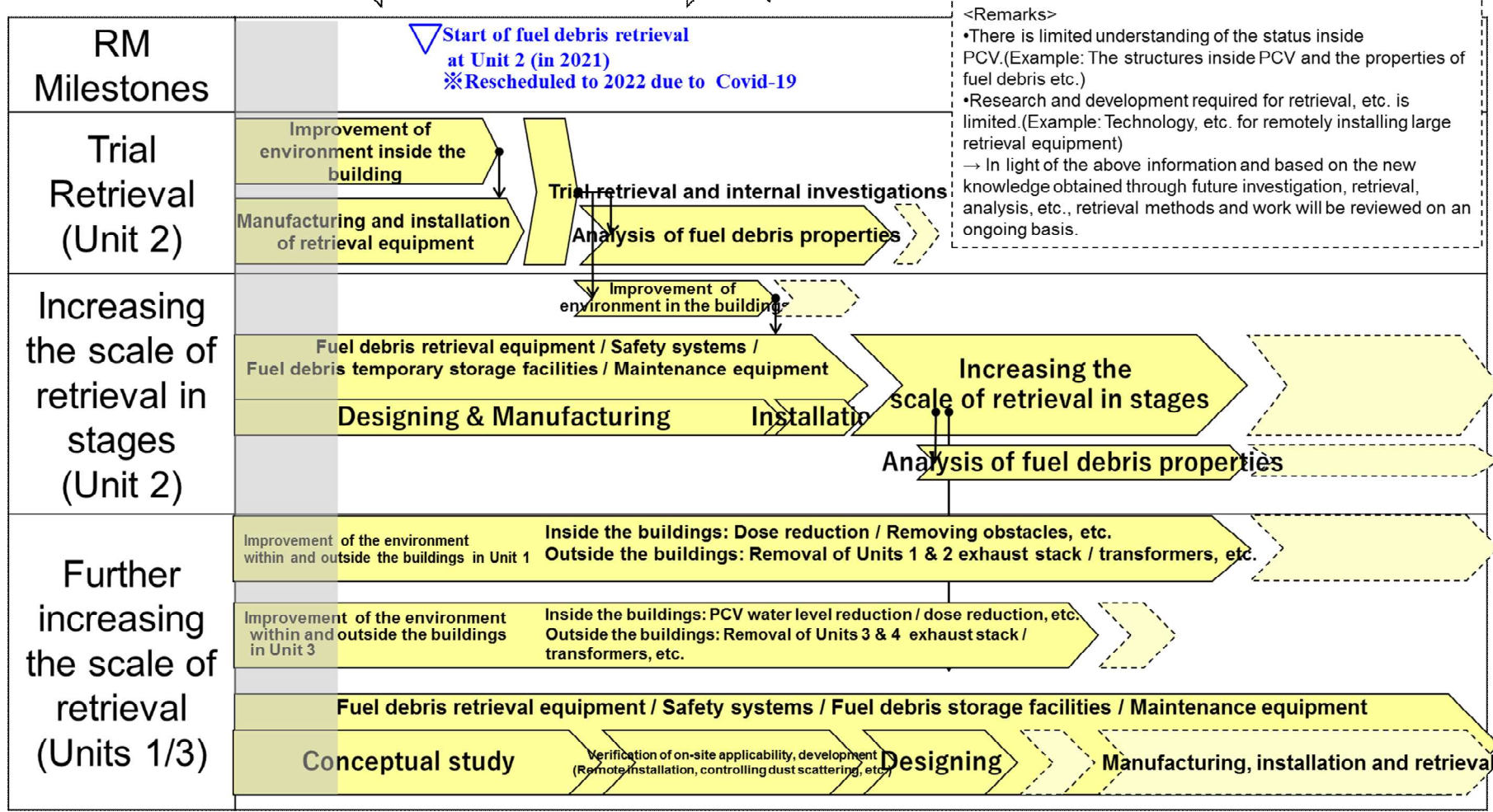
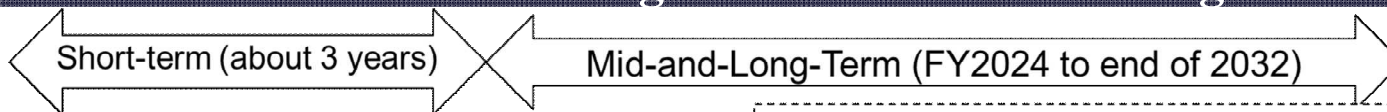


at a factory in Kobe (Jul. 12)





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





A group of people, including children and adults, are gathered around a large wooden drum. One person is using a mallet to strike the drum. The scene is outdoors, and the background shows other people and a banner with Japanese text. The overall atmosphere is one of a community event or festival.

# Fukushima Reconstruction through Decommissioning



- A firm based in Fukushima accomplished dismantlement of the exhaustive stack for Units 1 & 2.
- We held briefing sessions for local businesses as well as meetings between local firms and TEPCO's contractors.

## Dismantlement of the exhaustive stack for Units 1 & 2 ( by a local firm )



## Briefing on TEPCO's procurement plans for local firms



## Meeting between contractors and local firms





- **TEPCO is to set up and operate a factory in coastal areas in Fukushima to manufacture decommissioning-related products which have thus far been produced in other parts of Japan.**
- **Joint venture to be launched between TEPCO and manufactures which have a track record in the nuclear industry.**
- **Involvement of the local people is being considered.**





Thank you for your kind attention

TEPCO

