



2022 IAEA General Conference, Side Event

Fukushima Daiichi Decommissioning Current Status and Challenges

September 26, 2022

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Chief Decommissioning Officer

**President of Fukushima Daiichi Decontamination
and Decommissioning Engineering Company,**

Tokyo Electric Power Company Holdings, Inc.



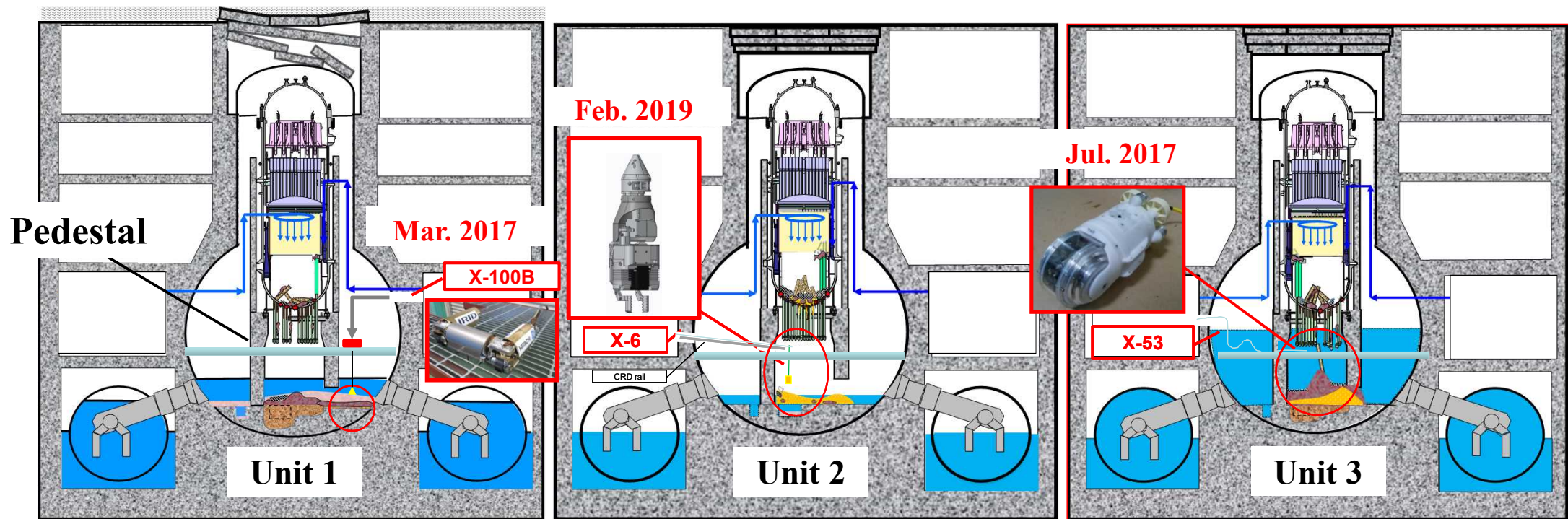
Work toward Fuel Debris Retrieval

IRID has contributed to some work shown here

Robotic exploration

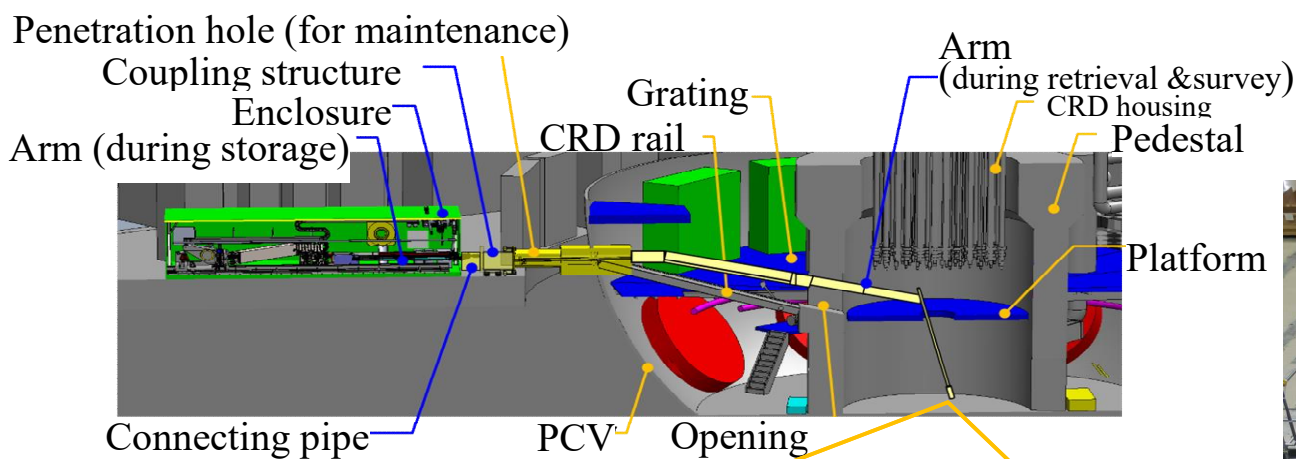
Analysis of
accident transient

Muon Survey

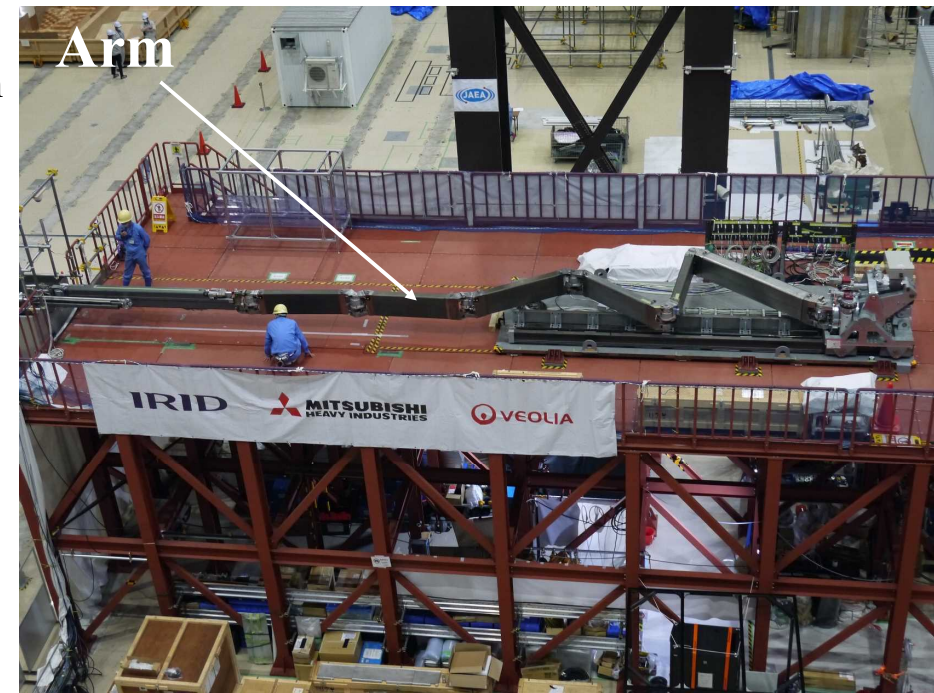


Trial retrieval to start at Unit 2 in the near future

■ The mock-up tests and trainings are being conducted using the actual equipment at “Naraha Center for Remote Control Technology Development” set up by JAEA.



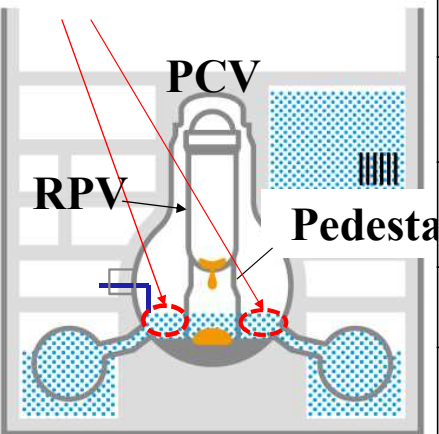
Investigation Item	Measuring devices to be mounted
Detailed vision	Pan-tilt camera
3D rendering	Airborne laser scanning equipment
Gamma ray dose rate	Gamma camera
Neutron flux	Neutron detector



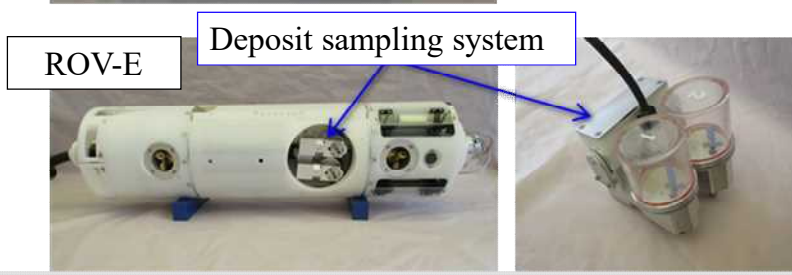
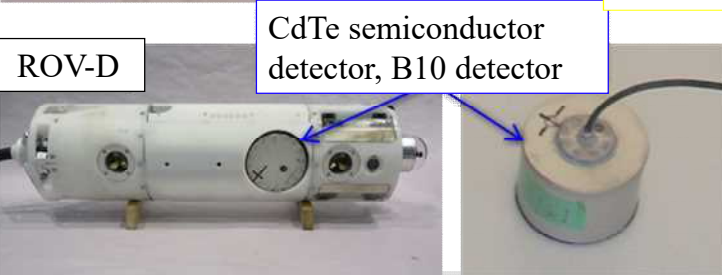
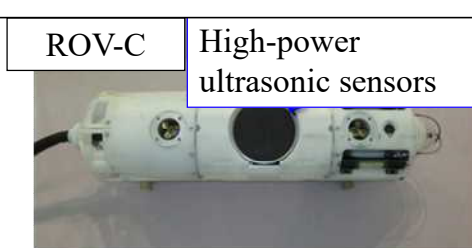
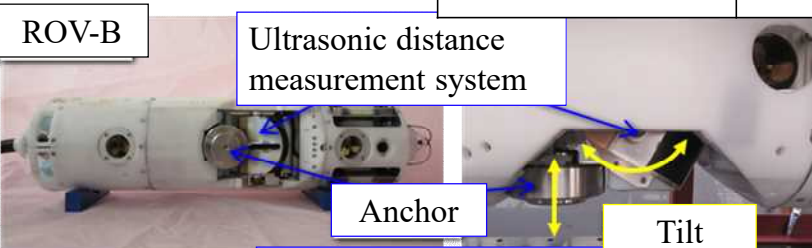
Source: IRID

Unit 1 internal investigation (from February 2022)

Main investigation areas



ROV category	Device	Purpose
ROV-A	Gamma ray detector	Setting the Guide ring
ROV-A2	Gamma ray and B10 detector	Getting detailed images to confirm the status
ROV-B	Ultrasonic distance measurement system	3D mapping of deposits
ROV-C	High-power ultrasonic sensors	Measuring the thickness of deposits
ROV-D	CdTe semiconductor detector, B10 detector	Measuring the neutron flux on the surface etc.
ROV-E	Suction type sampling device	Deposit sampling

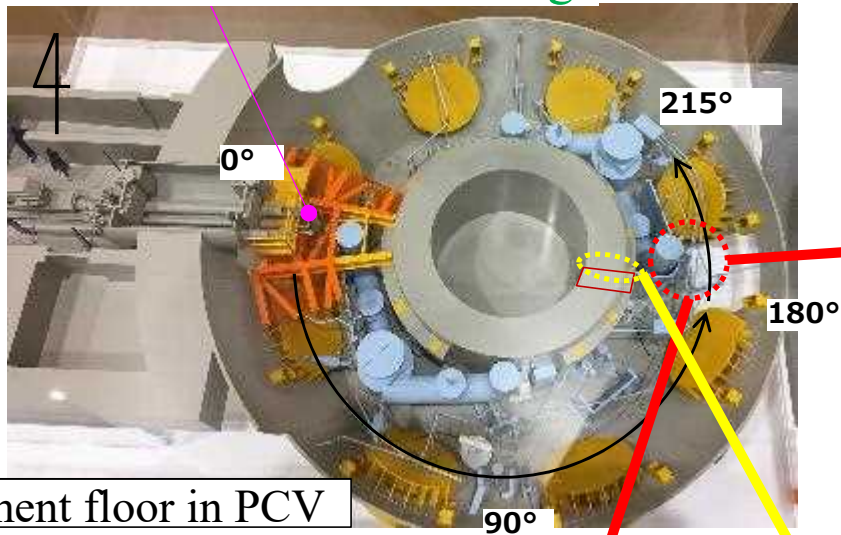


Note: ROVs to be submerged in the order of A, A2, C, D, E, B and A2.

Source: IRID

Photos taken during the internal investigation at Unit1

Area where the ROV was submerged



Jet Deflector

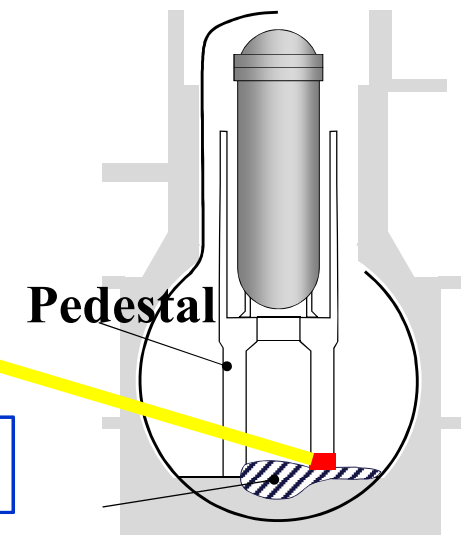
Layers of deposit



Jet Deflector



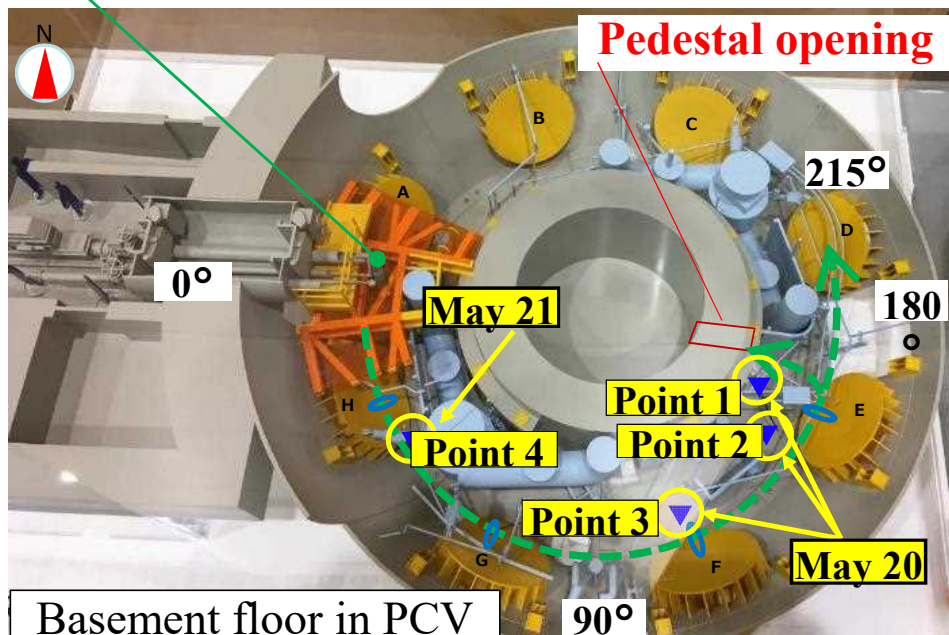
Reinforcing steel



Neutron flux measurements inside Unit 1

- Thermal neutron fluxes were detected at all measurement points. These can be attributed to the fuel debris.

Area where the ROV was submerged



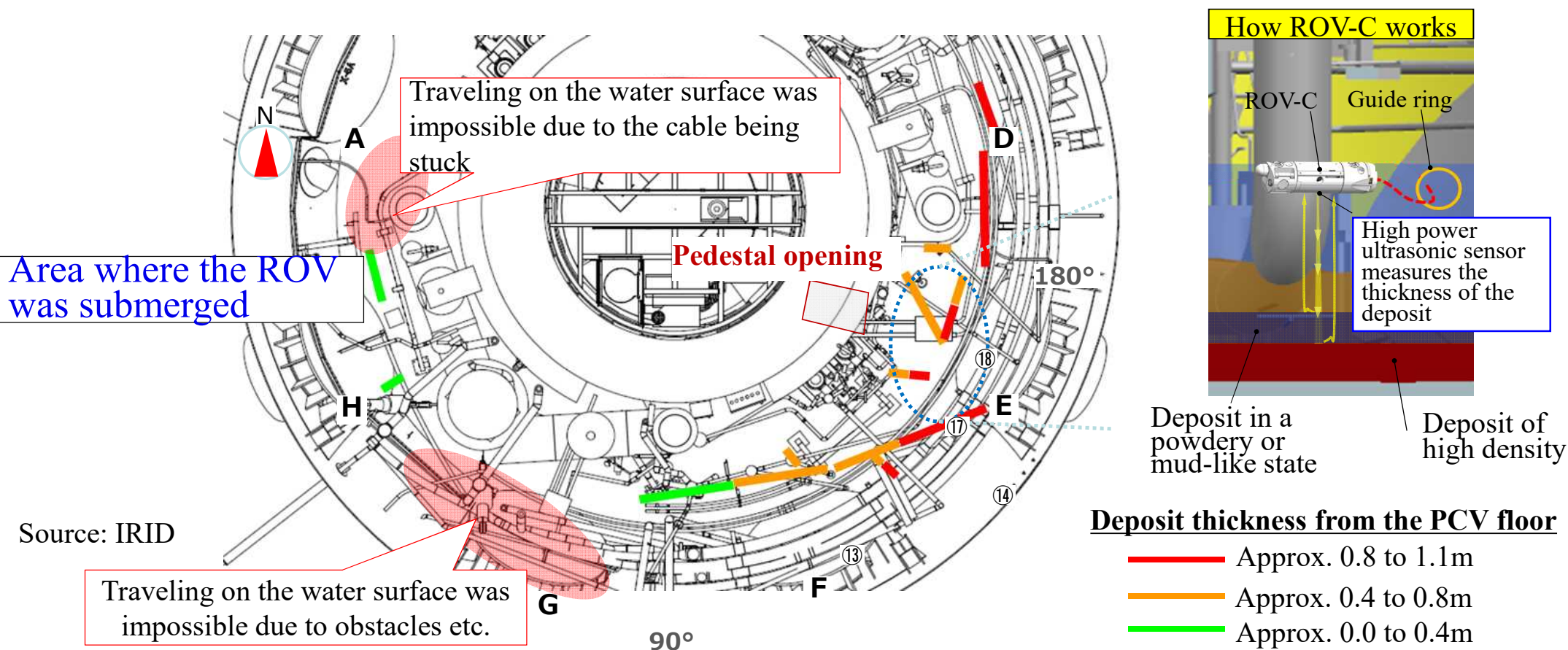
Neutron flux measurement results

Measurement points on deposits	Neutron flux [/ cm^2/s]
Point 1	48.0
Point 2	29.1
Point 3	50.2
Point 4	5.8

Source: IRID

Measurement of deposit thickness inside Unit 1

- It was confirmed that the deposit thickness was relatively high near the pedestal opening and became lower as the ROV moved away from the opening.



Handling of the ALPS Treated Water



Simple overview of water management at Fukushima Daiichi

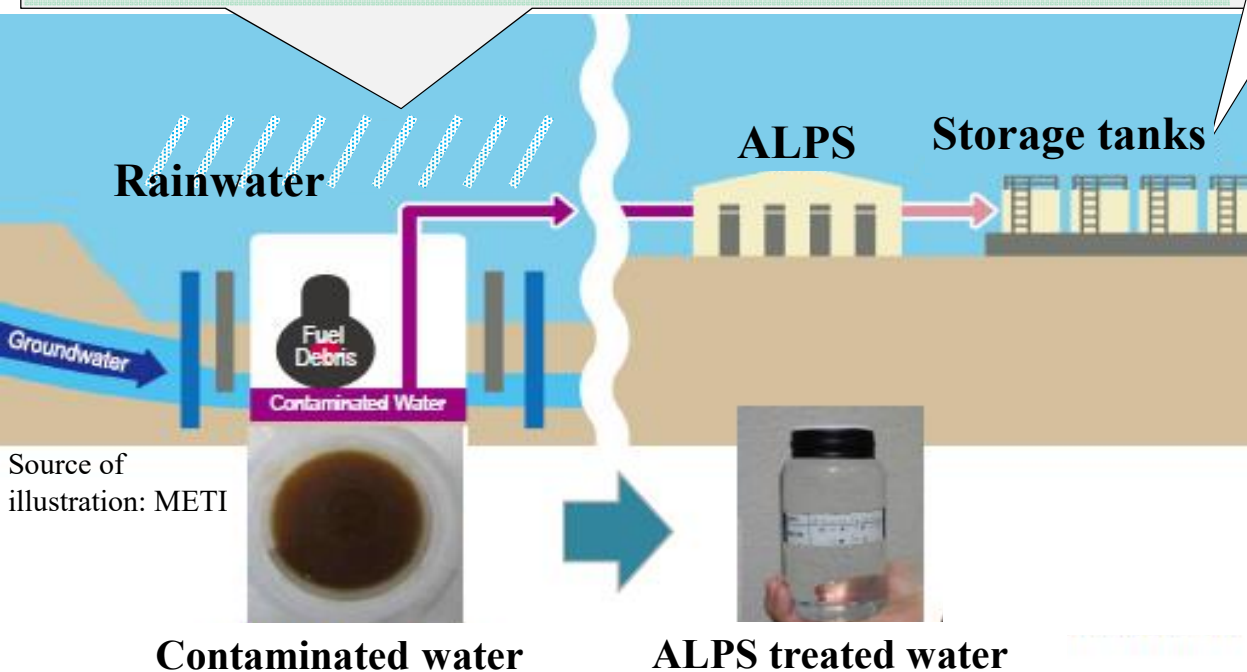
Contaminated water management

Redirect fresh water from contaminated areas

Contaminated water generation decreased to about 130m³/day in FY2021 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 1.31 million m ³ (as of early Sep. 2022)
Secured tank volume	About 1.37 million m ³ (1,047 tanks)
Generation rate of water stored in tanks	About 130 m ³ /day



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

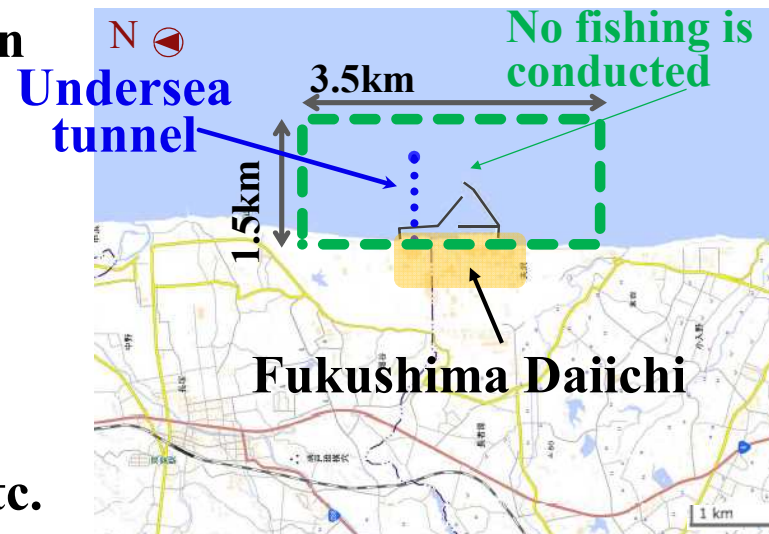
Seawater pumps
(to be installed for dedicated use)

Seawater for dilution

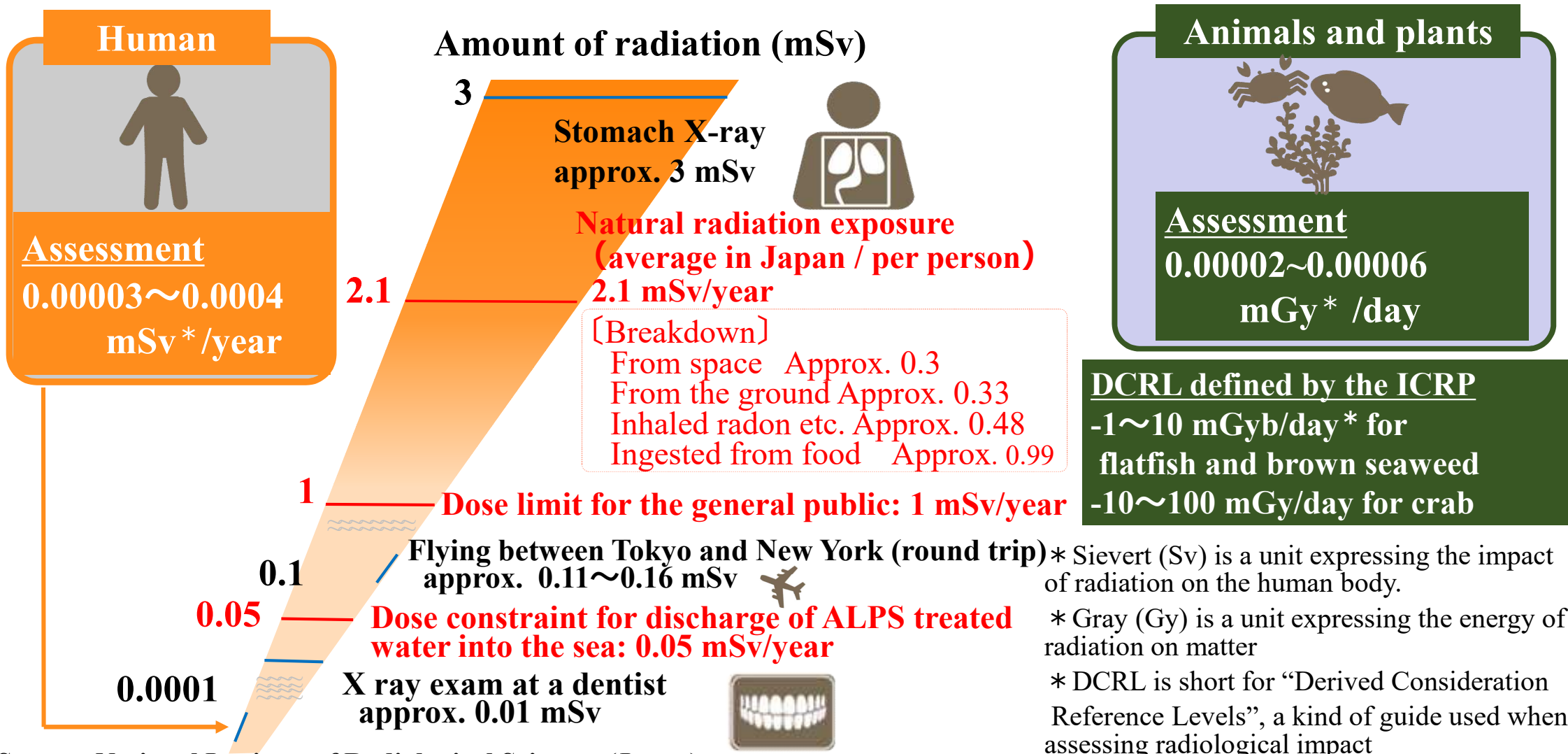
**Confirming that ALPS
treated water has mixed
with sea water and been
diluted before discharge**

Discharge to sea

**Undersea tunnel
(approx. 1km)**



Assessment of Radiological Impact on Public and Environment Regarding the Discharge of ALPS Treated Water into the Sea (Design stage)



Source: National Institute of Radiological Sciences (Japan)



Reconstruction through Decommissioning



So far

STEP 1 Involve local firms in de-commissioning

- Place orders with local firms as much as possible if they can handle the work themselves
- Create an environment for local firms to participate, or increase orders

Current Activities

- Briefing on procurement outlook
- Business meetings
- Consultation service center
- Networking parties

STEP 2 Help local firms improve capabilities

- Help improve managerial & technological capabilities so that local firms can expand into more advanced areas

- Visits to individual firms
- Tours of Fukushima Daiichi Site for local firms

From now on

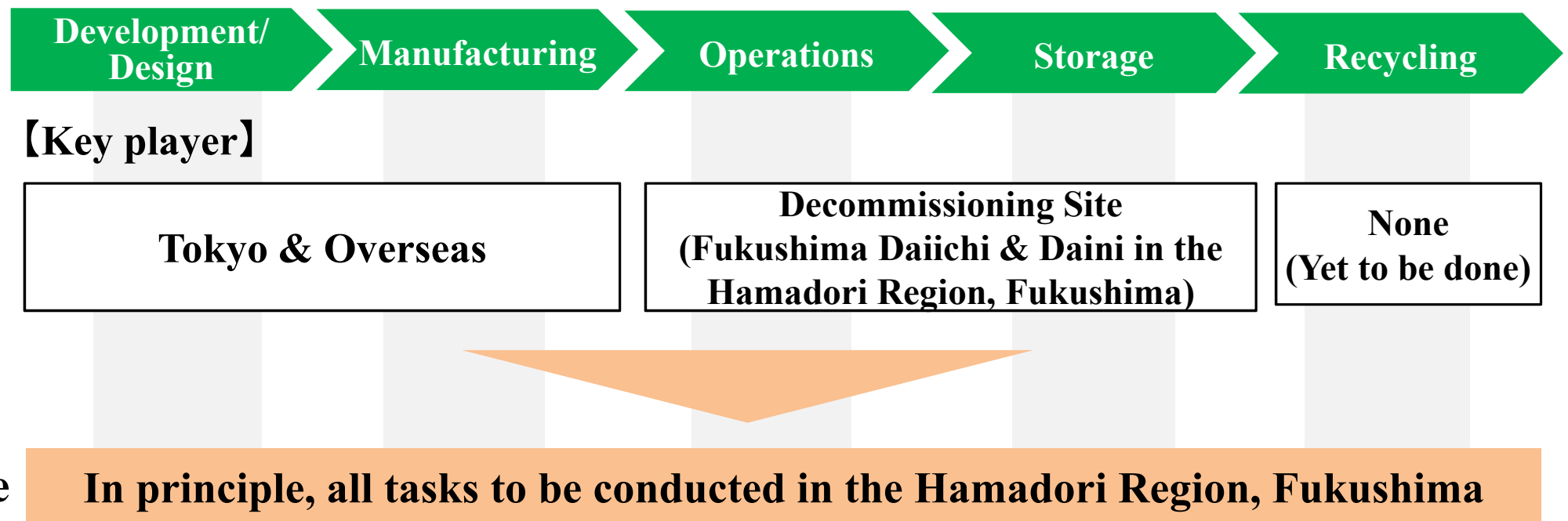
STEP 3 Create new industry in the Hamadori Region

- Create new facilities or entities that can develop & manufacture core products which have thus far been sourced from Tokyo and abroad

- Decommissioning-related products factory (Manufacturing casks for spent fuel & fuel debris storage containers)

- TEPCO would like to play a key role in inviting companies with cutting-edge technologies from outside Fukushima and contributing to employment, HR development and creation of industrial & economic base in the region.

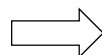
【Basic flow of the decommissioning project】



TEPCO HD

Fukushima Daiichi &
Fukushima Daini
Nuclear Power Stations

Order
placement



•
•
•

Order
placement

Other businesses



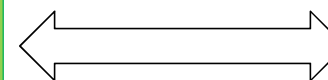
A new factory for decommissioning-related products

- JV between TEPCO & Hitachi Zosen
- Contribute to HR development & creation of economic base etc.

Example of product:
Casks for transport
& storage



- Collaboration
- Alignment
- Order placement



Local firms

Company	(Provisional title) Hamadori decommissioning-related products factory
Location	Naraha Town, Fukushima Prefecture (planned)
Representative	To be announced
Establishment	October 2022 (planned)
Capital Contribution Ratio	TEPCO HD: 2/3 Hitachi Zosen: 1/3
Number of employees	Dozens
Business outline	Manufacturing & sales of casks and fuel debris storage containers ※ For the time being, casks for Fukushima Daini Decommissioning Site to be produced

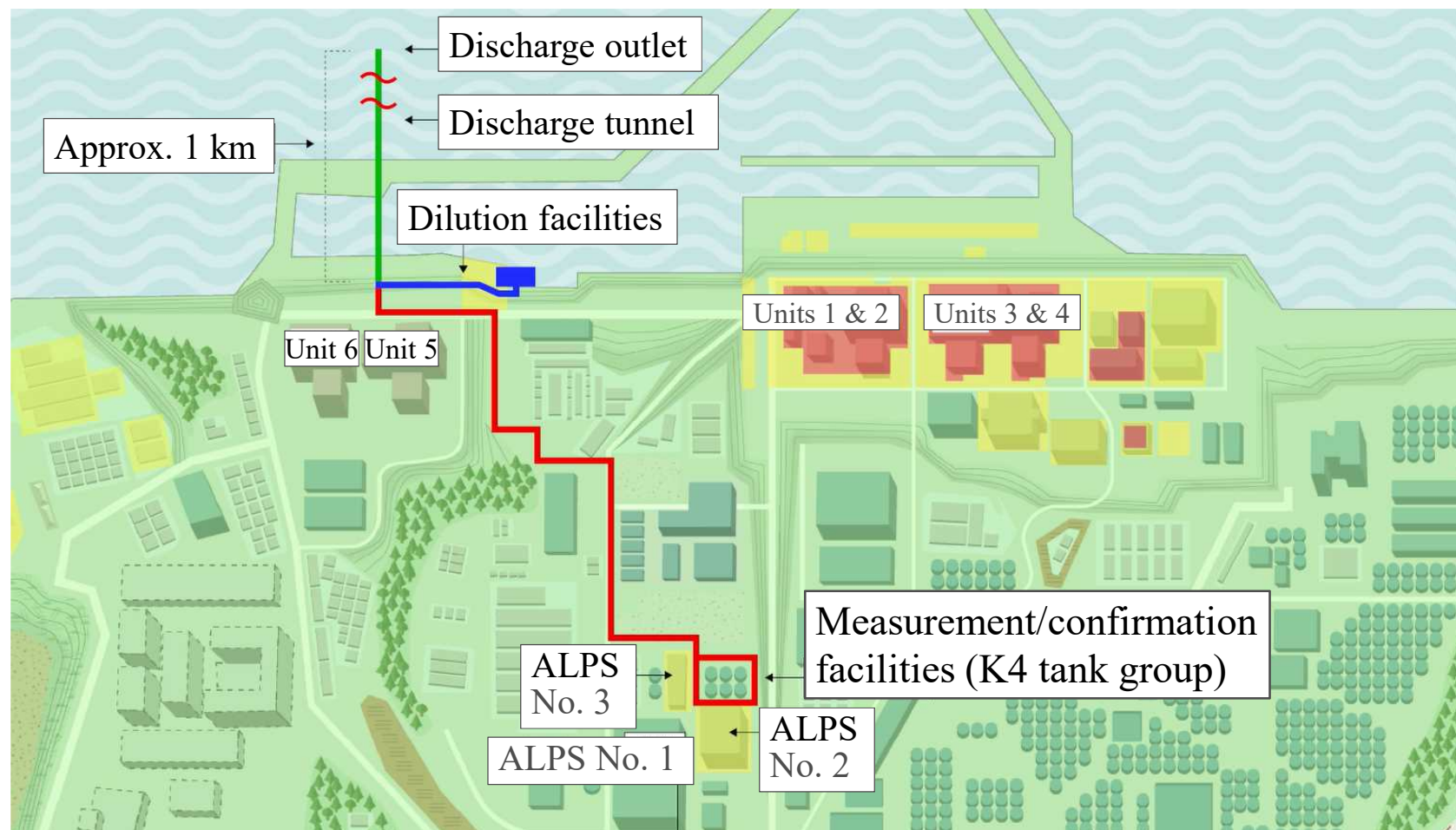
Thank you for your kind attention

TEPCO

A perspective view down a long, industrial tunnel. The tunnel is lined with large, curved metal segments. Several large, green-painted pipes run along the length of the tunnel, supported by metal brackets. The floor is made of metal grating. The lighting is dim, with a bright light source at the far end of the tunnel, creating a strong perspective effect. The word "Appendix" is overlaid in the center in a white, serif font.

Appendix

Transport route for ALPS Treated water



Caisson at the discharge outlet for ALPS Treated water



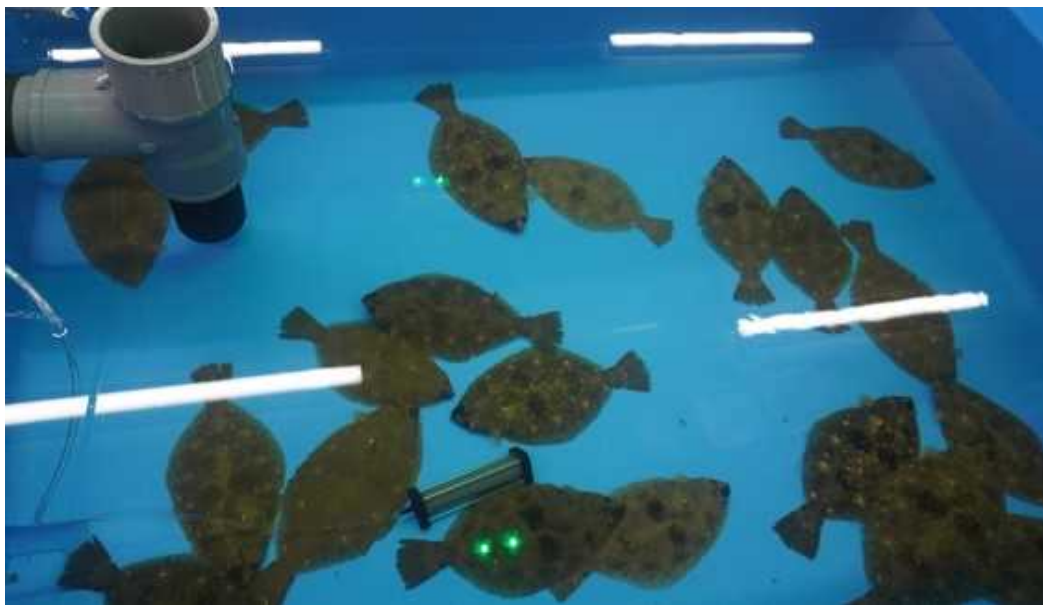
Unloading of a shield machine



Tunneling using a shield machine



Flounder



Abalone

