Japan's Side Event at the 69th IAEA General Conference

Strategic Plan of Fuel Debris Retrieval Method for the Decommissioning of the Fukushima Daiichi Nuclear Power Station (FDNPS)

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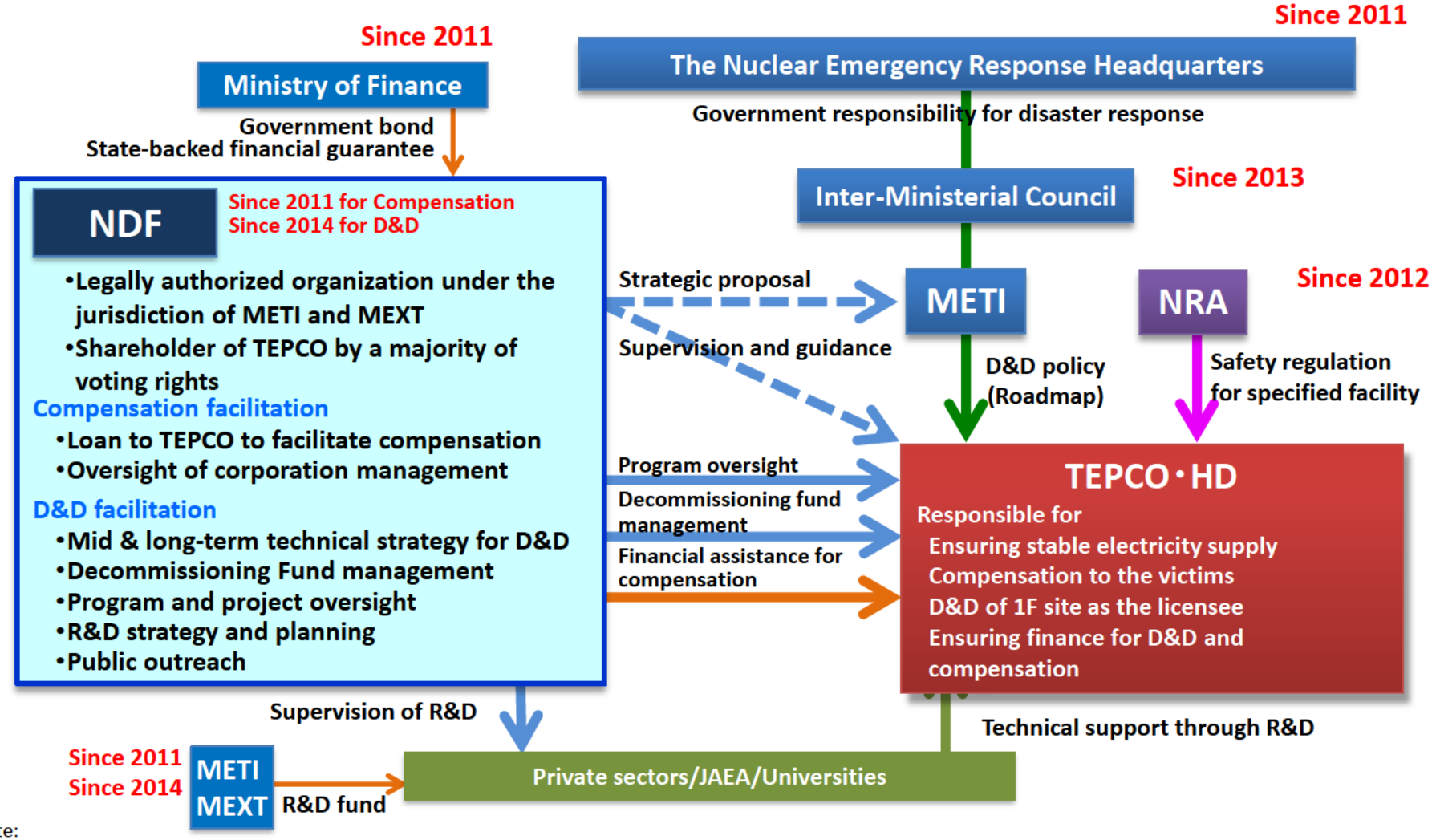
1. Introduction of NDF



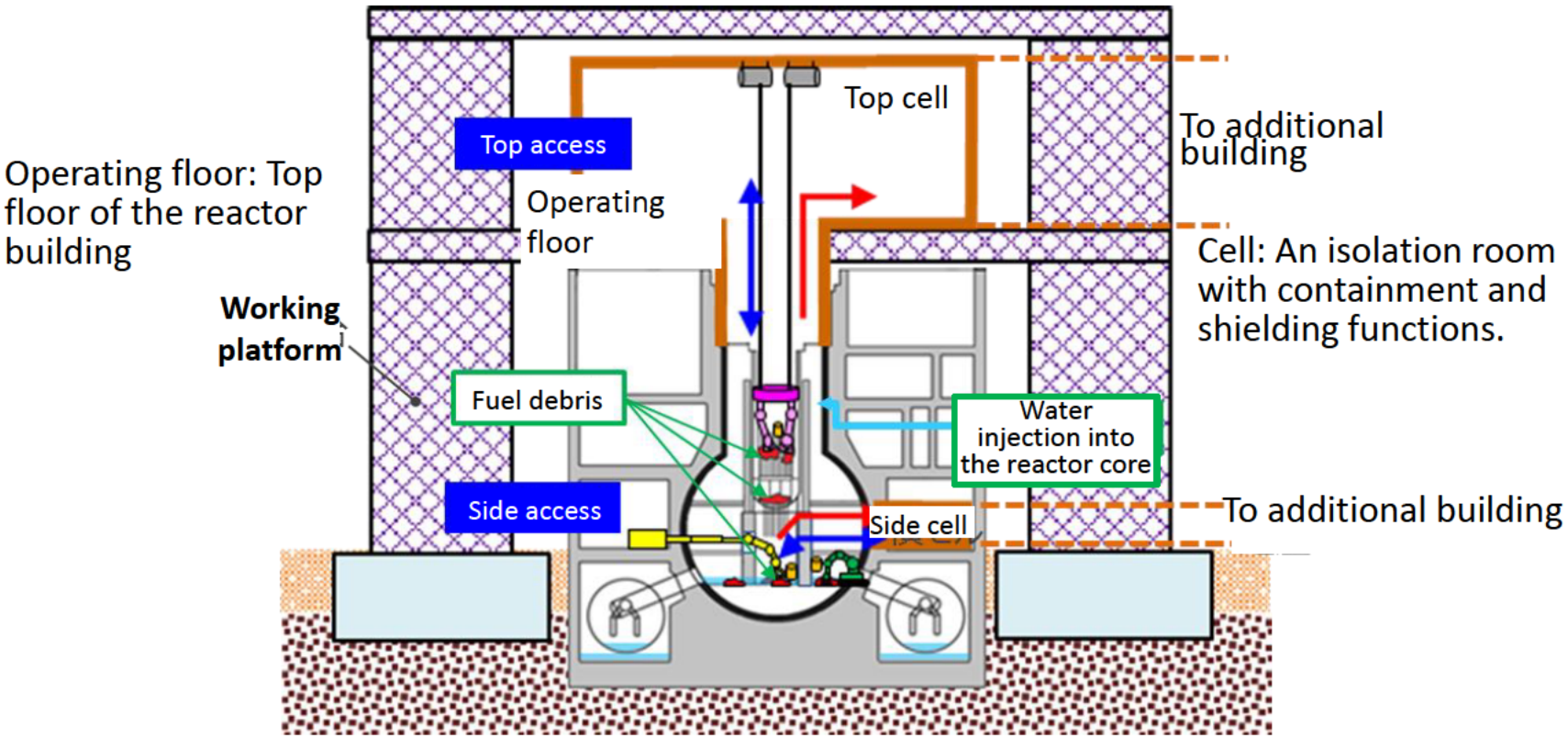
Note:
METI: Ministry of Economy, Trade and Industry
MEXT: Ministry of Education, Culture, Sports, Science and Technology
JAEA: Japan Atomic Energy Agency
TEPCO HD: Tokyo Electric Power Company Holdings, Inc.

2-1. Sub-Committee for the Fuel Debris Retrieval Method

- **NDF established the Sub-Committee for the Evaluation of Fuel Debris Retrieval Methods in March 2023. Mr. Toyoshi Fuketa was appointed as a Chairperson of the Sub-Committee, who is a former Chairperson of the Nuclear Regulatory Commission in Japan.**
- The Sub-Committee's tasks;
  - ✓Clarifying issues on each retrieval method
  - ✓Evaluating technical feasibilities of measures for the issues
  - ✓Comparative evaluation of each retrieval method
  - ✓Suggestions for next steps

2-1. Retrieval method selection

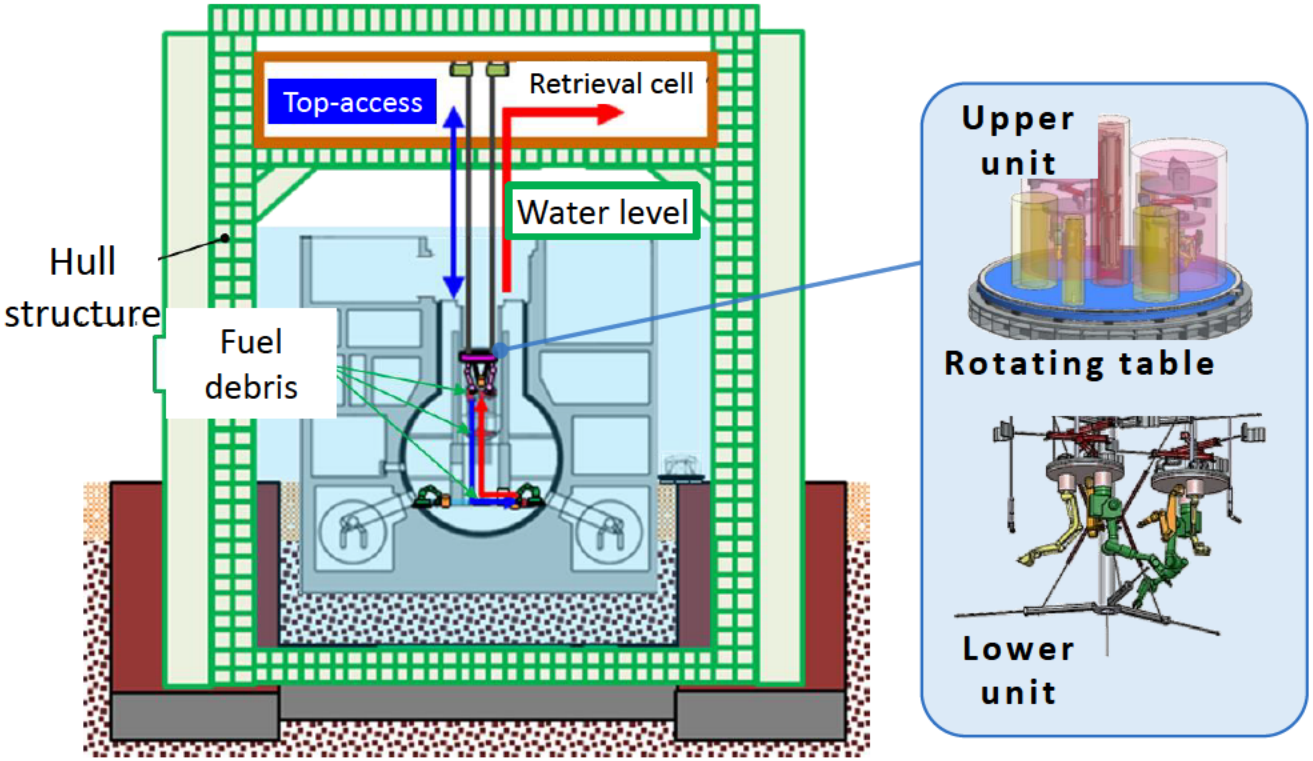
(1) Partial submersion method



The figure is provided by TEPCO

2-1. Retrieval method selection

(2) Submersion method



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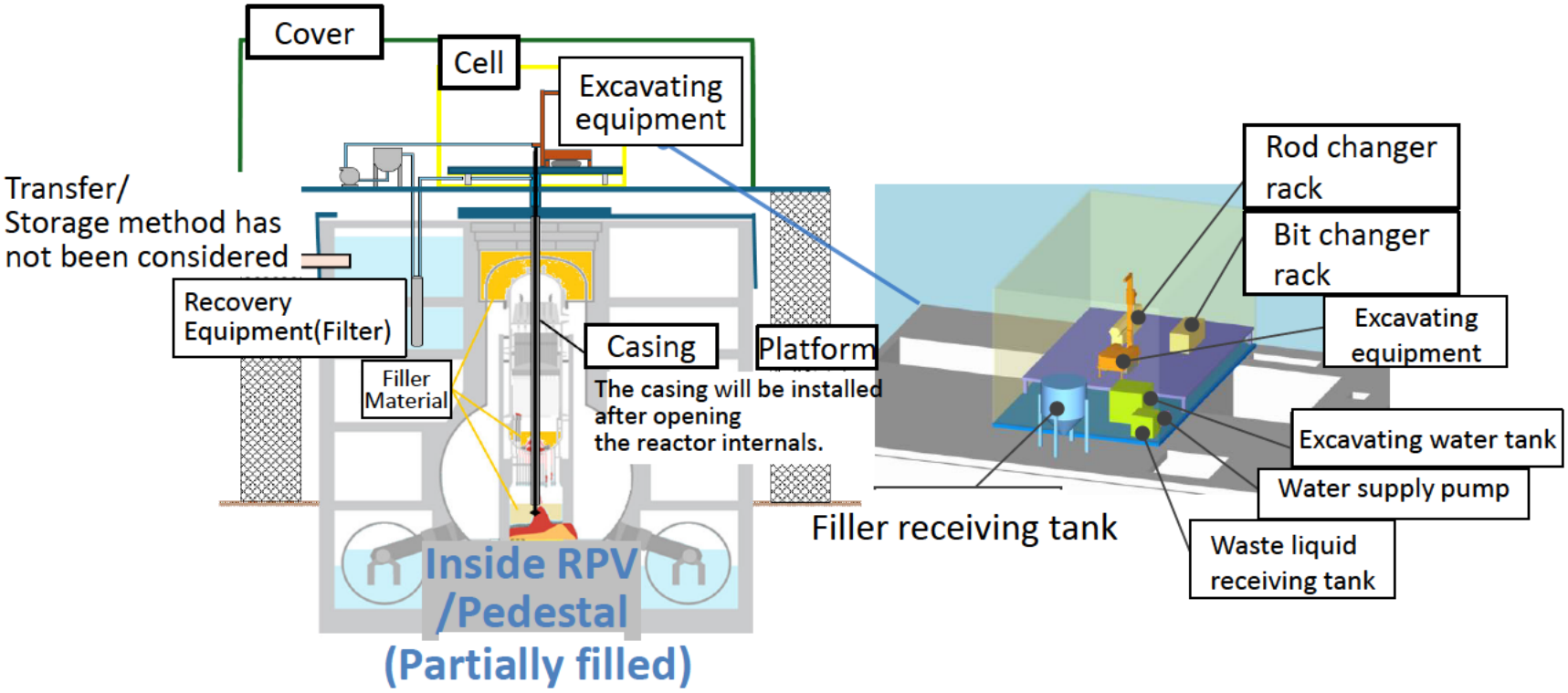
2-1. Retrieval method selection

(3) Filling and solidification method



2-1.Recommendations for retrieval method selection

Recommendations for retrieval method selection (March 2024)

- Regardless of the retrieval method selected, it is vital that effort be made to ascertain the conditions inside the reactor and to reflect this information in design and safety assurance.

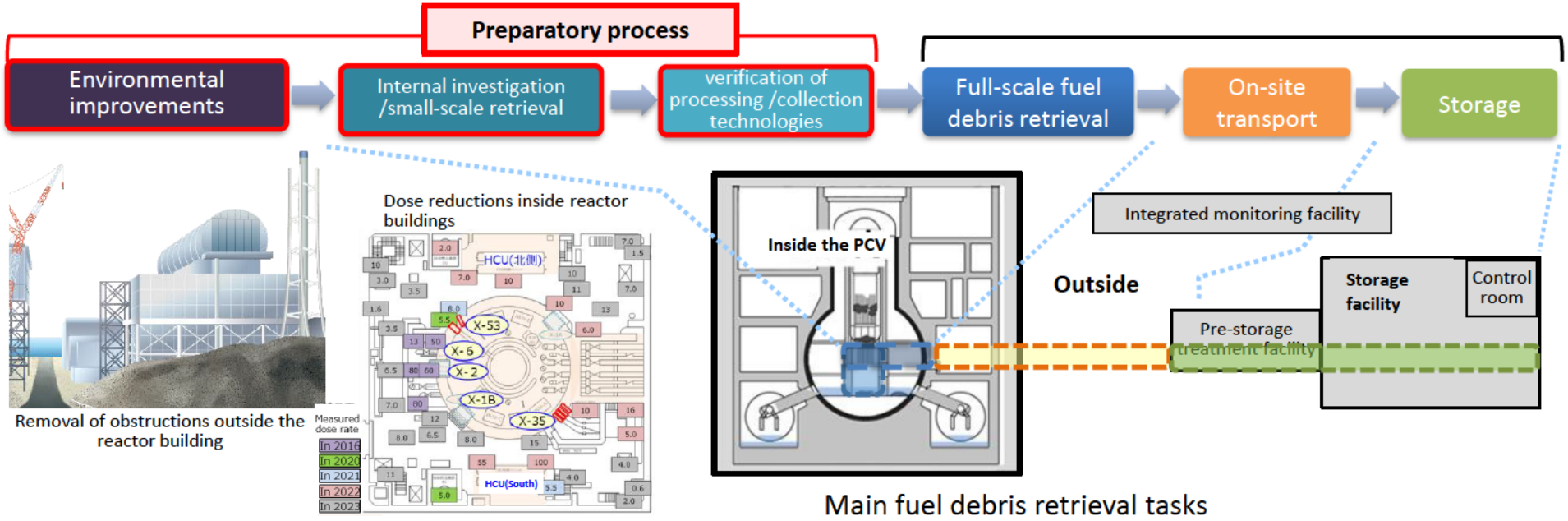
- **Begin design deliberation/R&D that combine the non-submerged method with its method options.**
- **At the same time, conduct small-scale internal investigations utilizing top access points.**

2-2.Current status of the Sub-Committee's discussions

- The Sub-Committee mainly discussed preparatory processes, such as internal investigations, small-scale retrieval, and the verification of processing/collection technologies, etc., as well as the schedule for doing so, because these issues can be presented with a certain degree technical basis after the fuel debris retrieval method has been established.

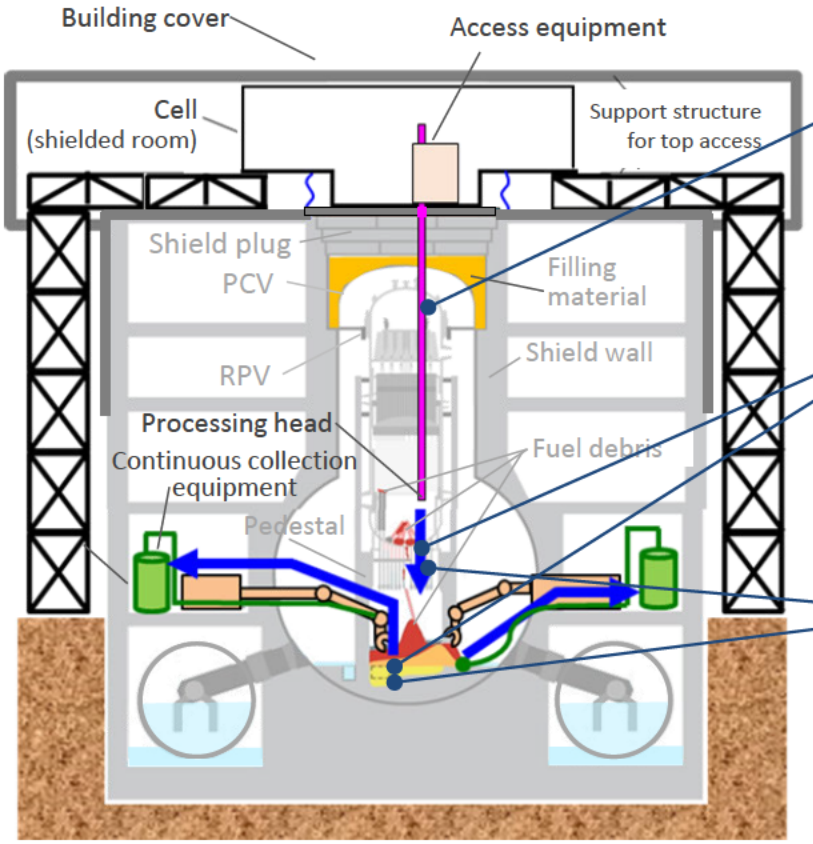
Only preparatory tasks and schedules can be presented with technical basis.

Review based on the information obtained during the preparatory process



Main fuel debris retrieval tasks

2-2. Retrieval method selection deliberation plan



Fuel debris retrieval route

Gain access through a small opening

- ✓ Use the shielding functions of the existing shield walls

⇒ Minimize the size of the cells to be added

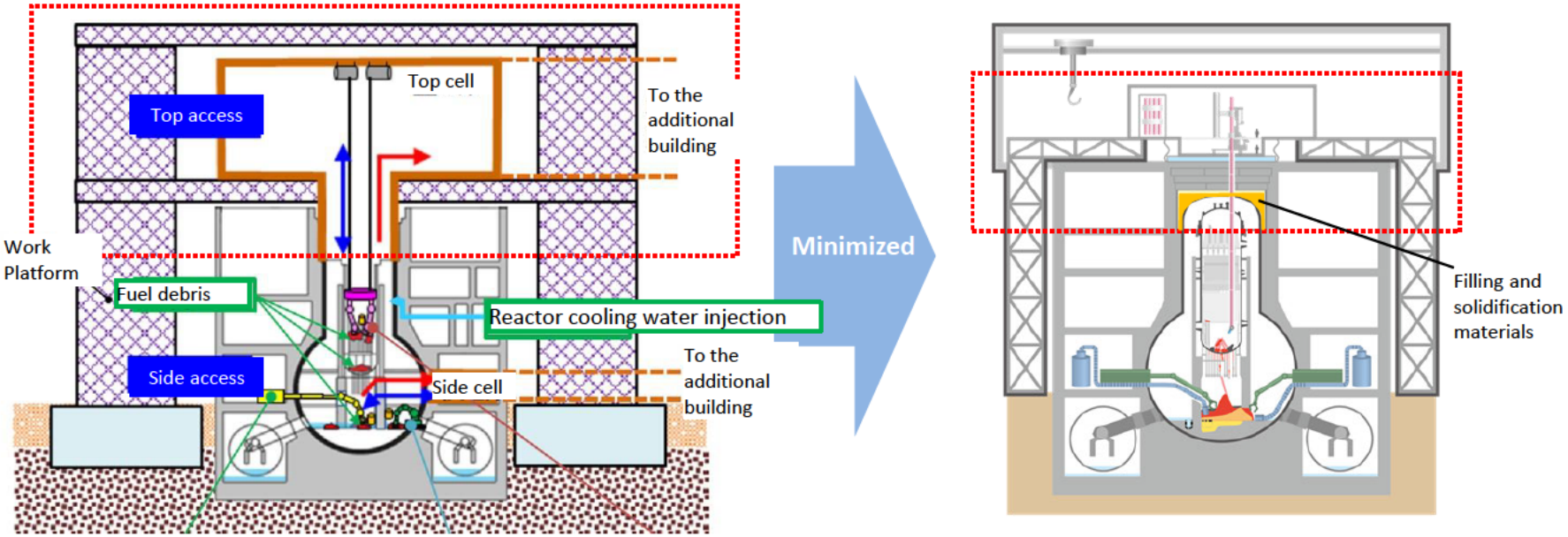
Standardize/simplify the handling of fuel debris (processing, collection, etc.)

- ✓ Process fuel debris into small pieces
- ✓ Continuously collect small pieces of fuel debris

Combine the use of top/side access openings

- ✓ Lower fuel debris processed by utilizing top access through an opening at the bottom of the RPV⇒ Continuous collection in combination with side access
- ✓ Enables continuous collection even with side access alone

2-2. Retrieval method selection deliberation plan



Non-submerged method
(Shared with sub-committee in March 2024)

Non-submerged method + non-submerged method options (filling and solidification method)
(shared with sub-committee in July 2025)

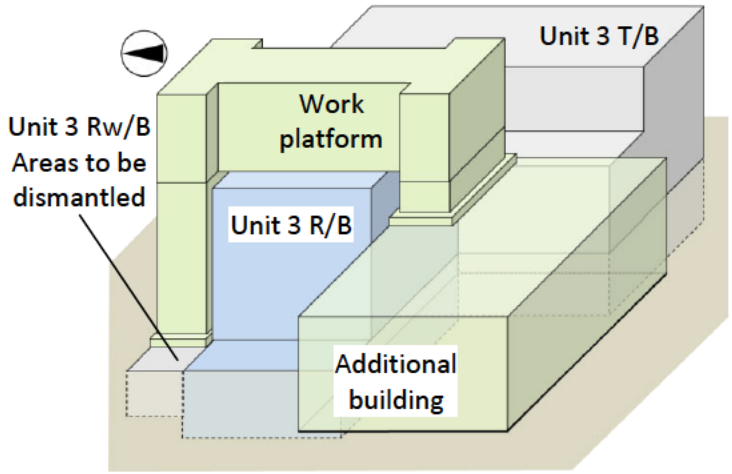
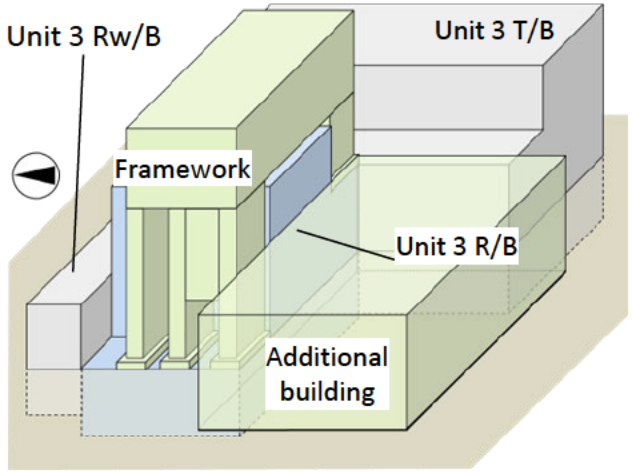
2-2. Promoting environmental improvements

Promoting environmental improvements

- ✓ Outside the reactor building, buildings and structures that interfere with the installation of new structures have been removed.
- ✓ Inside the reactor building, the focus was put on reducing dose levels.

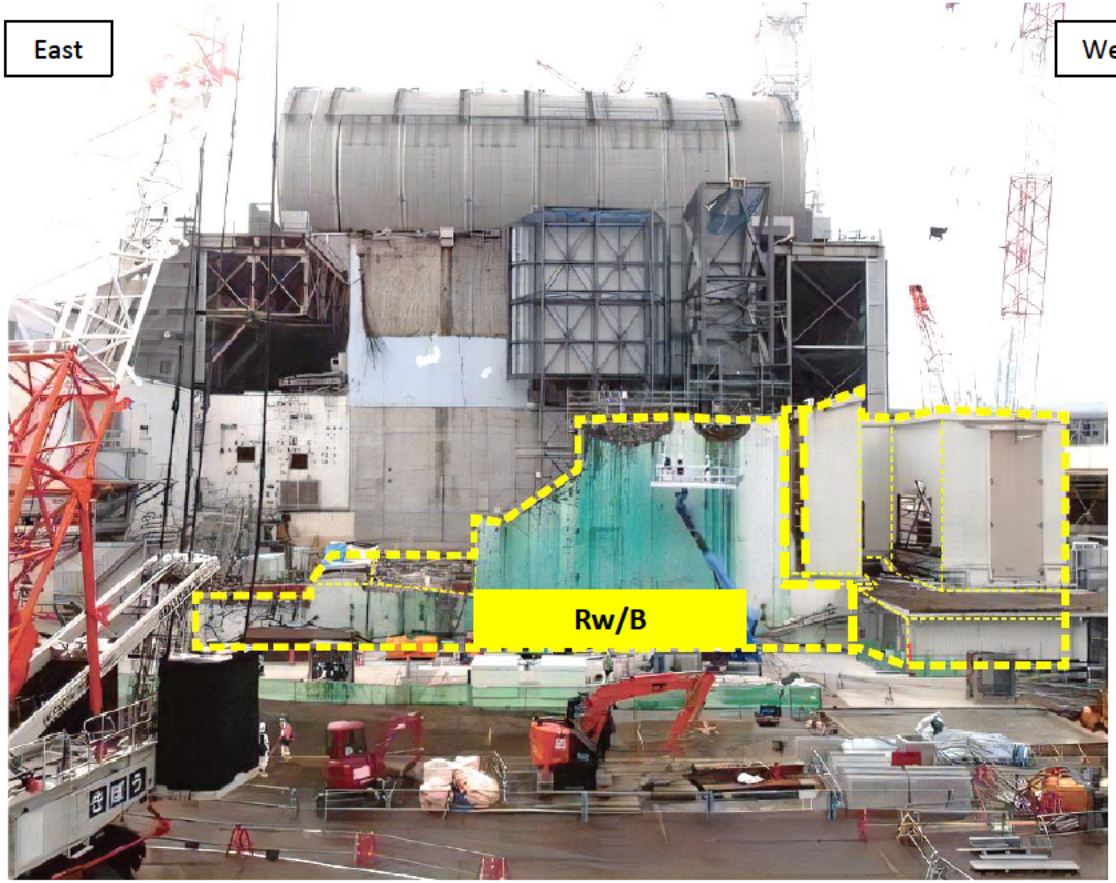
[Outside the reactor building]

■ Examples of newly installed structures (support structures for top access)

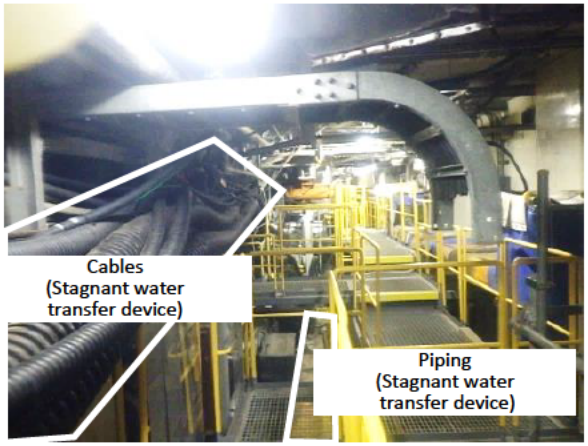
Example of deliberations	North-South work platform plan	East-West framework plan
Schematic diagram		
Expected major issues	■ Interference with Unit 3 radioactive waste treatment building (Rw/B)	■ Restrictions on the weight of installed equipment due to the load capacity of the reactor building

2-2. Promoting environmental improvements

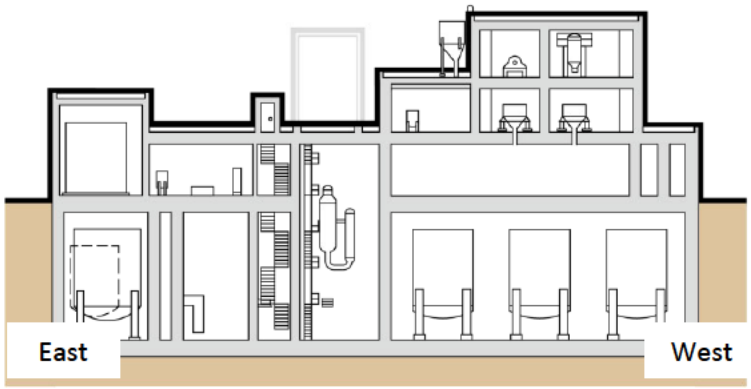
- The Unit 3 Rw/B is located on the north side of Unit 3 and used to treat radioactive waste liquids, gases, and solids from the reactor and turbine buildings. The building has tanks to store waste resin from the cleansing of reactor coolant during reactor operation.



Unit 3 Rw/B



Inside the Unit 3 Rw/B

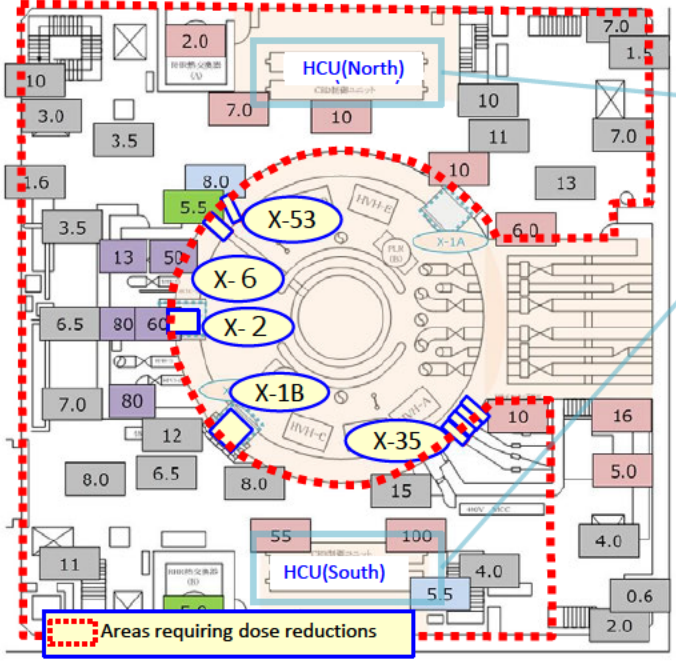


Cross section of Unit 3 Rw/B

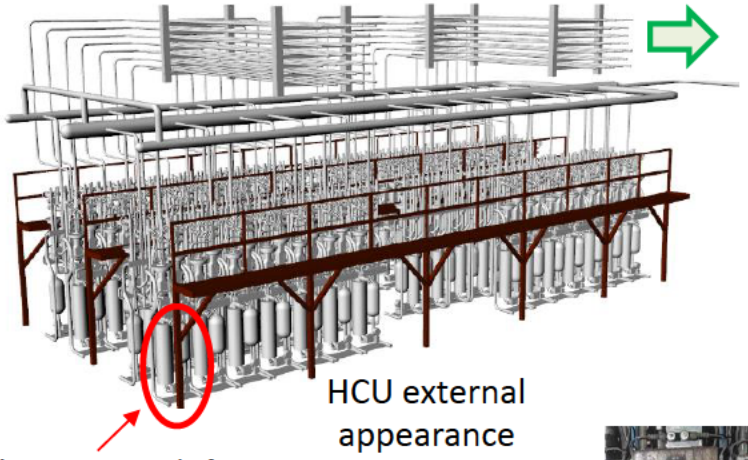
2-2. Promoting environmental improvements

[Inside the reactor building]

[First floor of the reactor building]
Areas where dose reductions are necessary

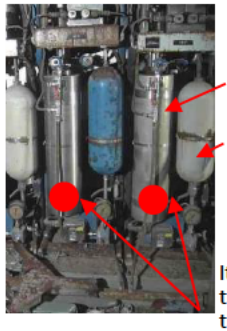


Connected to PCV



HCU external appearance

There are a total of 137 accumulators and nitrogen cylinders on the north and south sides.



It is estimated that there is a hot spot at the bottom of the accumulators.

【Major issues expected】

- **The radiation level on the first floor of the reactor building is generally high.**
  (Decontamination efforts to date have not been able to sufficiently reduce dose levels.)

【Major issues expected】

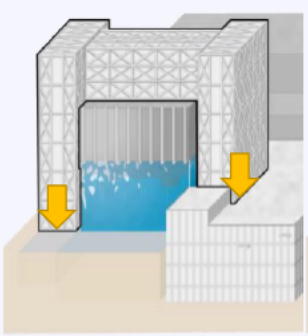
- **The HCU (CRD control unit) highly radioactive**
  ✓ There are 137 units on the north and south sides of the HCU, each requiring individual handling.

2-2. Issues requiring additional review

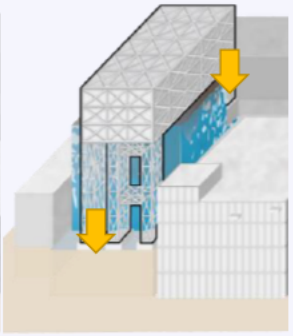
Issues requiring additional review during the preparatory process

Main assumption❶

The load margins of the work platform/framework are sufficient for installing top access equipment



North-South work platform plan



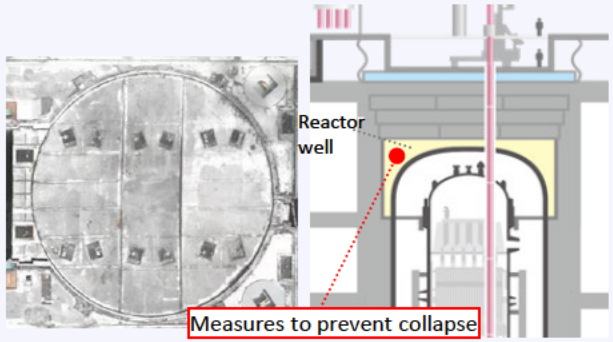
East-West framework plan

Issues to be reviewed in the future

[Design Verification]
Review of top access equipment
[On-site verification]
Survey of support structures for work platforms/framework (lower section and operating floor of the reactor building)

Main assumption❷

The shield plugs at the top of the PCV will not be removed during the preparatory stage



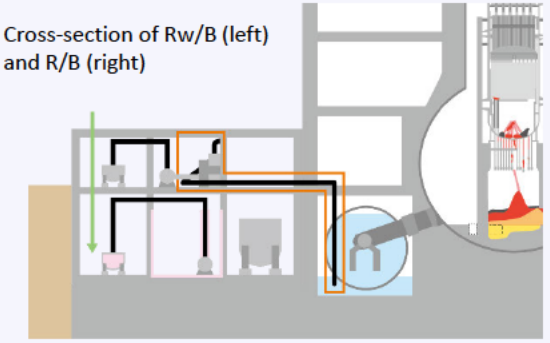
The shield plug at the top of the PCV is damaged, and measures to prevent collapse are necessary

Issues to be reviewed in the future

[On-site verification]
Survey of the scope of measures to prevent collapse (reactor well walls and spent fuel pool gates)

Main assumption❸

Other tasks can be performed during the demolition and removal of the Unit 3 Rw/B



It is necessary to remove equipment connected to the reactor building and recover highly radioactive waste.

Issues to be reviewed in the future

[On-site verification]
Examine how equipment to be removed interferes with other tasks, review subfloor doses, investigate the properties of highly radioactive resin

3. Dialogue with local communities on decommissioning

NDF has been conducting direct dialogues with residents in Fukushima Prefecture since fiscal 2024.

◆ Number of Events

Fiscal 2024: 29 meetings in 16 municipalities
Fiscal 2025: 32 meetings in 16 municipalities

< The questions from participants>

- What is the status of the completion of decommissioning?
- How is the removed fuel debris stored and disposed of?
- How safe are workers at the decommissioning site?
- How will the region be involved in decision-making on decommissioning?

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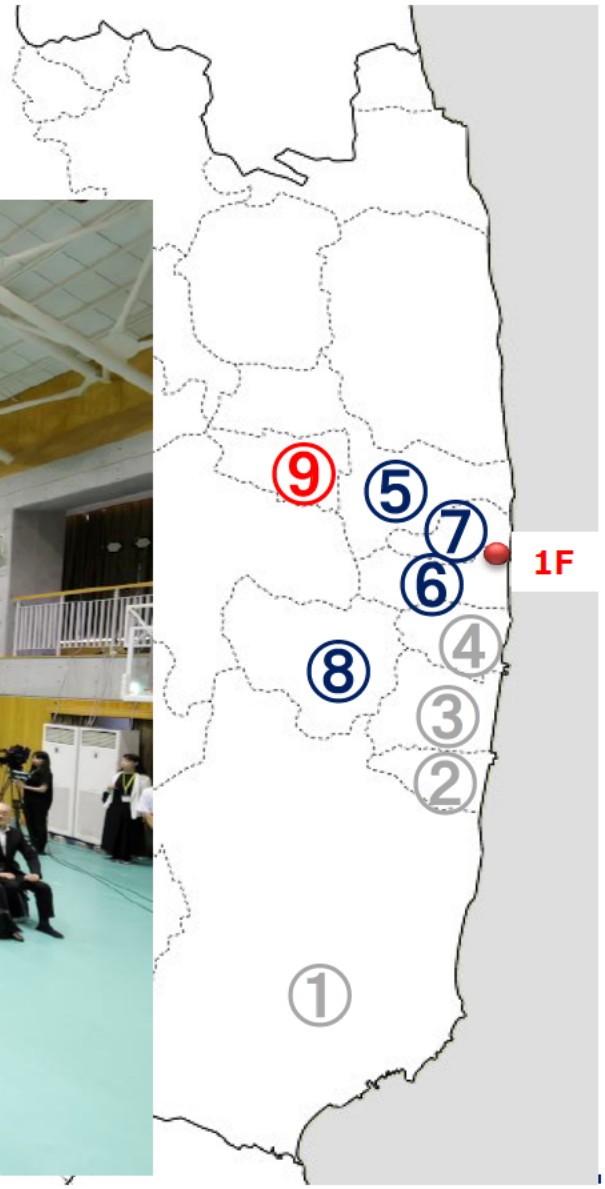
3. Dialogue with local communities on decommissioning

International Forum on the Decommissioning of the Fukushima Daiichi Nuclear Power Station

Katsurao-village Junior High School



3. Dialogue with local communities on decommissioning

Technical details were not discussed…

- Mixture of reconstruction and decommissioning
- The importance of dialogue and information sharing to help residents feel connected to decommissioning
- What can be done to pass this legacy on to future generations

These were the main topics discussed.

Thank you for the attention!