Phase: **Preparation**

Decommissioning Process **"Fuel Removal from SFP"**
Investigation Subject **"Understanding current status"**
Issue **"Understanding current status of SFP"**

Needs

1. Understanding current status of SFP

Desired state and reasons for it

- For fuel removal from the SFP, it is desirable to be able to understand the status of interfering obstacles, the working environment (target nuclides, dose equivalent rate, air density, surface density), and fuel in the SFP and the operation floor.
- These are important points for reducing worker exposure and contamination of survey equipment, and controlling dust dispersion during fuel and other material removal operations and preparation for such operations.

Current state against ideal

Unit 1

- In the Unit 1, the roof shingles, steel frames and other construction materials that constituted the upper part of the building, and overhead cranes collapsed as debris on the operation floor due to the hydrogen explosion. While residents are returning to their homes, from the viewpoint of further reducing the risk of dust dispersion, a change on removing fuel in the Unit 1 pool was made in December 2019 to a method of removing the rubbles and fuel from the pool inside the cover by covering the entire operating floor with a large cover.
- In preparation for the installation of the large cover and subsequent rubbles removal work, rubbles fall prevention and mitigation measures including the installation of overhead cranes and supports for fuel handling equipment to prevent any impact on the fuel in the pool and curing of the spent fuel pool were completed in November 2020, and removal of the interfering existing building cover (remaining portion)was completed in June 2021.
- As for the method of removing the overhead crane, a detailed investigation will be conducted after the roof slab is removed, because at this point there is limited information on the condition of the lower part of the roof slab. Depending on the results, there will be a risk that the crane dismantling process may be delayed. Therefore, work procedures, etc., should be drafted after extracting the necessary work for investigation and confirmation, etc. Overhead cranes, etc., should be investigated as soon as investigation becomes possible, and the investigation results, including risk cases, should be reflected in the safety assessment and debris removal plan.

Unit 2

- For the Unit 2 the method is adopted to access from a fuel removal platform to be installed on the south side of the reactor building, without dismantling the upper part of the operation floor from the perspective of further reducing the risk of dust dispersion as with Unit 1.
- TEPCO submitted an amended application in March 2022 to change the implementation plan for the fuel handling facilities, which was originally submitted in December 2020, by dividing the application into two parts: fuel removal platforms and fuel handling facilities considering the

status of the examination of the application of the new seismic design policy and the progress of the preparatory work. Furthermore, the installation of the fuel removal platform and the anteroom were completed in June 2024. Subsequently, following the installation of the openings to the reactor building and the runway gantry, the fuel-handling facilities were installed in May 2025, and standalone functional testing has been conducted since August 2025.

- In addition, based on the results of the dose survey conducted in 2021 inside the operation floor and on the well plugs, decontamination and installation of shields on the top of the wells, etc. were carried out in the operation floor, and the effect of dose reduction was confirmed again in May 2022. Preparation work for further decontamination and shielding, etc., as well as the relocation of existing handling facilities, is ongoing for the removal of fuel.
- In order to reduce radiation doses, decontamination and installation of shields are being carried out after completion of moving existing fuel handling machines, etc., installation of an opening on the south side of the operation floor after the decontamination is planned. Since there is a risk that the work area will be contaminated again, thorough measures should be taken to prevent dust scattering when the opening is installed.

Unit 3

- In the Unit 3, although all the fuel from Unit 3 was removed in February 2021, other high-dose equipment such as control rods, channel boxes, and filters are stored in the spent fuel pool. Although these do not require cooling, they need to be shielded, and there are still risks such as exposure of radiation sources in the pool in the event of pool water leakage. Therefore, from the viewpoint of risk reduction, it is necessary to proceed with the removal of these high-dose equipment following the removal of the fuel from the pool. In doing so, since it is efficient to use the equipment, etc. used for fuel and rubbles removal, the removal should be proceeded as soon as preparations for removal, such as securing a storage site (for the Unit 3, the existing site bunker is planned), are in place. Thereafter, the pool water can be excluded from the control by draining the pool.

Units 5 & 6

- For the Unit 5 and 6, it is a policy of carrying out fuel removal work to the extent that it does not affect the work for the Unit 1 and 2. First, for the Unit 6, transferring fuel from the spent fuel pool to the common pool was started in August 2022.
- In February 2024, all fuel transfer and storage of spent fuel from Unit 6 using dry cask confinement were completed, and the spare capacity in the common spent fuel pool was secured. Consequently, the transfer of spent fuel from the Unit 6 spent fuel pool to the common pool was resumed in May 2024 and completed in April 2025. Note that 198 assemblies remain in the Unit 6 spent fuel pool, and 230 assemblies remain in the new fuel storage facility. After securing the spare capacity in the common pool, the transfer from the Unit 5 spent fuel pool to the common pool began in July.

Issues to be resolved

- The spent fuel removal operations are underway at each Unit, and no major issues exist. It is expected that the current status of the spent fuel pools and operation floors will continue to be monitored in the future, though it is necessary to proceed paying attention to reducing the radiation exposure of the workers.

Relevant Issues

- SFP-201 “Understanding and preventing emission and leakage”
- SFP-202 “Ensuring structural integrity”

- SFP-301 “SF removal”
- FDR-210 “Understanding hydrogen generation behavior”
- FDR-213 “Fuel debris retrieval policy”
- FDR-214 “Establishing debris collection strategy”
- FDR-218 “Developing fuel debris retrieval equipment and devices”
- FDR-219 “Ensuring safety in processing fuel debris”
- FDR-301 “Fuel debris retrieval inside PCV”
- FDR-302 “Fuel debris retrieval inside RPV”