Phase: **Design**

Decommissioning Process **"Transport/Storing/Storage (including Wastes containing Alpha Nuclides originating from Fuels)"**
Investigation Subject **"Maintaining stabilized condition"**
Issue **"Developing storing container integrity evaluation and management technology"**

Needs

1. Investigating a long-term storage policy for water treatment secondary waste

Transport/Storing/Storage：【Long 2】

Desired state and reasons for it

- To store secondary waste generated from contaminated water treatment in long term and stably, it is desirable to investigate storage method considering not only the storage period and storage environment, but also on phenomena that occur during long-term storage, such as age-related deterioration.

Current state against ideal

- Regarding ALPS slurry and decontamination equipment sludge, which have high water content rate and are fluid, investigation will be given to the implementation of stabilization (dehydration) treatment, taking into account comments from the review of the implementation plan for specific nuclear facilities and other issues related to storing risk reduction and volume reduction, etc. for the former, and for the latter, it is scheduled that the material will be collected from the underground storage tank in the building, the current storage location, dehydrated, packaged, and transferred to a storing facility on higher ground from FY2027.
- In addition, a solidification policy for unstable materials such as water treatment waste should be established by FY2025. A transition to a more stable state (dehydration or solidification and storage in a facility with the necessary earthquake resistance) is indicated as a further goal to be achieved in the future.
- In addition, adsorption towers, which have particularly high radioactivity levels among secondary waste generated from contaminated water treatment, are scheduled to be stored in a large waste storage facility that is currently under construction. On the other hand, R&D is underway on evaluation of corrosion and measure against corrosion of storage container in Government-led R&D Program on Decommissioning and Contaminated Water Management.

Issues to be resolved

- It is necessary to identify phenomena and risks that may occur during storage and investigate the need for countermeasures considering the conditions prior to storage (e.g., dehydrated ALPS slurry), the subsequent storage period, and the storage environment.

2. Establishing an evaluation method required for safety assessment of the transfer and storing system

Transport/Storing/Storage：【Long 1】

Desired state and reasons for it

- To ensure the safety of the transfer and storage system, it is desirable that the scope and criteria of evaluation be clear.
- If an existing safety assessment method exists, it is desirable to use it after advancing and simplifying it as necessary.

Current state against ideal

- The transfer and storage systems are being investigated for solid waste, secondary waste generated from contaminated water treatment, and fuel debris, respectively.
- In particular, for fuel debris, basic specifications of storage canister including safety functions and safe transfer conditions are being investigated for gradual expansion of the scale of fuel debris retrieval.

Issues to be resolved

- It is considered necessary to organize guidelines for evaluation methods for each waste to be transferred and stored, or for all wastes.

3. Stabilizing wastes for a long term

Transport/Storing/Storage：【Long 2】

Desired state and reasons for it

- It is desirable that the properties and composition of wastes will be clarified and that long-term stabilization technologies will be developed for these wastes.

Current state against ideal

- Since it is necessary to sort solid waste and fuel debris rationally from the viewpoint of radioactive waste disposal, work for understanding each property is being proceeded.
- Since the test retrieval of fuel debris began in September 2024, information and knowledge on the properties of the fuel debris are expected to be updated as needed.

Issues to be resolved

- It is necessary to advance the understanding of the properties of fuel debris and waste, as well as the aging behavior of such wastes.

Relevant Issues

- TSR-101 “Characterization”
- TSR-202 “Understanding hydrogen generation behavior”
- TSR-204 “Design of canister specifications”
- TSR-205 “Criticality control”
- TSR-301 “Transport/storing/storage method investigation”