

Decommissioning Process “**Common Issues**”  
Investigation Subject “**Knowledge management**”

## Needs

### 1. Establishing a sustainable knowledge management system

#### Desired state and reasons for it

- In order to sustainably secure technologies and human resources for Fukushima Daiichi NPS decommissioning, it is desirable to establish a sustainable framework, including the way of knowledge management.
- Since the decommissioning of the Fukushima Daiichi Nuclear Power Plant is a national and social issue, it is important to establish an accessible system so that the organizations participating in R&D for decommissioning could effectively utilize R&D outcomes such as obtained knowledge, etc.
- It is required to optimize all decommissioning operations from a bird’s eye view in order to continue the project over a long period of time. It is thus essential to establish a system to ensure knowledge management and its review, which will serve as the basis for the optimization of decommissioning.
- The decommissioning of Fukushima Daiichi Nuclear Power Plant must be proceeded with the understanding of a wide range of people, including local residents. In particular, it is essential to gain a full understanding of the decommissioning project by ensuring a full understanding in terms of overall risk reduction efforts.

#### Current state against ideal

- The decommissioning of Fukushima Daiichi NPS is a difficult task that has never been experienced before and knowledge in various fields is required. Therefore, not only in the field of nuclear energy, but also in a wide range of other fields such as machinery, chemistry, civil engineering, and materials, technology development is being conducted by various entities (including universities, research institutes, domestic and foreign entities, and TEPCO Holdings, etc.) at each stage of basic research, applied research, and field application, and technical information is scattered.

#### Issues to be resolved

- It is necessary for the decommissioning of Fukushima Daiichi NPS required to challenge a long-term, difficult and highly uncertain issue like fuel debris retrieval to consolidate and accumulate a variety of knowledge and to systematically proceed with activities for resolving the issue from a medium- to long-term perspective.
- The issue is to consolidate and organize the knowledge of technologies, etc. that have been investigated and developed over the past 10 years, and to create a mechanism for the storing and management of knowledge based on the premise that the decommissioning of the Fukushima Daiichi NPS will continue for several decades.
- It is desirable to promote archiving from the perspective of information disclosure and knowledge sharing of outcomes related to R&D for decommissioning. It is an issue to organize

rules for the consolidation and sharing of archived materials, an archiving construction and management system, and management tools to be used.

- Since work under high radiation dose is required, it is desirable to promote efforts to prevent bias of exposure towards specific individuals, to reduce overall worker exposure, and to secure human resources from a long-term perspective. For this purpose, it is important to develop a database that can streamline work planning and exposure control.
- In order to gain understanding of the decommissioning project, it is important to set up a system for continuous monitoring of risks throughout the site and to communicate the status of risk reduction to the public in a way that is easy to understand for a wide range of people.

## 2. Operating knowledge management effectively and efficiently

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### Desired state and reasons for it

- In order to sustainably secure technologies and human resources for Fukushima Daiichi NPS decommissioning, it is desirable to operate the established knowledge management framework effectively and efficiently while updating it by organizing, utilizing, and providing feedback on previous work and other experience and information.

### Current state against ideal

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### Issues to be resolved

- It is necessary for the decommissioning of Fukushima Daiichi NPS required to challenge a long-term, difficult and highly uncertain issue like fuel debris retrieval to consolidate and accumulate a variety of technical knowledge and to systematically proceed with activities for resolving the issue from a medium- to long-term perspective.
- The formulated long-term plan should not be completely fixed and rigidly operated. In the concrete application of the long-term plan, it is even more important to set judgement points in advance at appropriate times when new knowledge can be obtained, to evaluate the progress of the work and the knowledge at such time, and then to investigate how to proceed afterwards, based on which operate the long-term plan revising with flexibility. In these investigations, it is necessary to establish a situation in which past knowledge and history can be checked in a timely manner.
- On the assumption that the decommissioning of Fukushima Daiichi NPS will continue for several decades, it is necessary to establish an efficient knowledge management operating method for realizing the storing and management of knowledge.
- For the high precision and efficiency of searches over accumulated knowledge, it is desirable to adopt the combination of large-scale language models (LLM) and Retrieval-Augmented Generation (RAG) whose technology innovation has been remarkable in recent years.

## Relevant Issues