

Behavior Diagram Analysis to Define Requirements on Site Clearance and Remediation

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1. Introduction

In the decommissioning of nuclear facilities, the final task of the project is clearance and remediation of the site. Behavior diagram was used to analyze the site clearance and remediation process, and designed the system environment using system engineering(SE) technology. Using the Nuclear Safety Act by the clearance and remediation of the site, decommissioning regulation, project performance and technical requirements, and criteria were derived.

2. Requirements definition for decommissioning activities

The decommissioning regulatory requirements extracted from the nuclear law were analyzed and simplification work was conducted as project requirements. The simplification was classified according to 19 major decommissioning activities. Requirements were defined through a method of identifying one clear project. In addition, by using the complement of the SE process, we have studied the application of the requirements-WBS-process and configured it to be used to define the missing requirements.

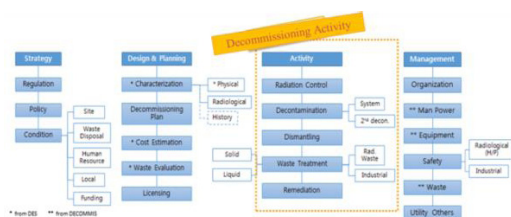


Fig. 1. The classification and scope of requirements management for decommissioning procedure.

2.1 Process analysis and behavior diagram

Decommissioning activity behavior diagram analysis refers to logically modeling the order of processes and inter-process interfaces when performing a specific decommissioning activity. The detailed activities of the decontamination and decommissioning module identified through the behavior diagram analysis ensure the requirements and traceability, and those complemented each other.

Process analysis and behavior diagramming purposes have four main purposes. First, it is to facilitate communication by reducing interpretation errors due to each background among stakeholders. Second, it can be added/refined the requirements as missing requirements is possible to identify through traceability between processes and requirements. Third, it can support WBS development that reflects the requirements of decommissioning procedure and major work process through ensuring traceability between process and WBS. Finally, the defined standard process can be used as a reference for defining the decommissioning detailed procedures of specific project.

3. Environment design and implementation to reflect scenario of SE for site clearance and remediation

3.1 Data collecting and definition of requirements on site clearance and remediation

The requirements related to the site clearance and remediation in decommissioning activity were

extracted from nuclear law and these are defined as the order of the decommissioning regulatory requirements → project performance requirements → technical requirements/technical standards. These requirements were defined by abroad documents as there is not much actual experience in the country. Figure 2 shows a schematic diagram of the implementation screen and references.



Fig. 2. Implementation examples of requirements definition scenario on site clearance and remediation.

3.2 Implementation examples of requirements definition scenario on site clearance and remediation

The project process related to clearance and remediation was schematized using Enhanced Function Flow Block Diagram(eFFBD). It was structured so that it can be extended from the parent process to the sub-process to confirm the detailed process. Figure 3 shows screens of the site remediation process behavior diagram.

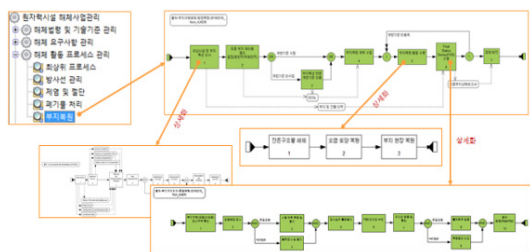


Fig. 3. Behavior diagram of site clearance and remediation.

3.3 Environment design and implementation to reflect scenario of SE for site clearance and remediation

WBS in site restoration field should be created to reflect SE scenarios in site clearance and remediation field. The WBS is based on ISDC [1] and is reflected in the master tree so that it can be easily searched.

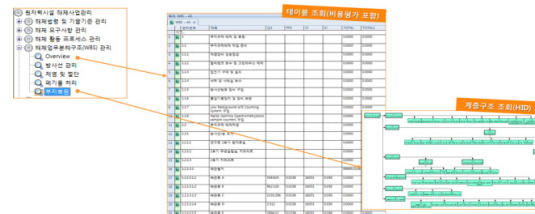


Fig. 4. WBS of site clearance and remediation.

4. Conclusion

It is possible to supplement the decommissioning requirements management database of the nuclear facilities decommissioning information management system through the behavior diagram analysis and the user interface implementation to define the decommissioning activity requirements. This means that WBS, processes and references can be entered into the decommissioning requirements management database to supplement the decommissioning requirements management database of the nuclear decommissioning information management system. The system designed through this study not only ensures traceability but also improves the reliability of nuclear decommissioning information data.

REFERENCES

[1] AEN, NEA. International Structure for Decommissioning Costing(ISDC) of Nuclear Installations, 2012.