Review of Project Management Areas in Nuclear Power Plant Decommissioning Projects

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1. Introduction

There might be various types of works to prepare during the transition phase to initiate decommissioning of nuclear facilities, such as approval of the final decommissioning plan, establishment of a dismantling and decontamination planning, and R&D of related technologies. However, among them, the establishment of project management approaches and processes to facilitate the management of decommissioning project will be one of the key tasks. Furthermore, if the licensee has no experience in decommissioning, the project management areas and the preparation of detailed procedures should be prepare as early as possible. Decommissioning may use some of the existing processes and procedures, such as construction and operational management, but it is also necessary to prepare a management plan that considers the characteristics of decommissioning only. Therefore, this study intends to review the international guidelines and experiences of decommissioning nuclear power plants in the areas of nuclear project management.

2. Methods and Results

This section reviews the project management areas of nuclear facilities suggested by IAEA documentation and describes the contents to be considered in overseas cases and literature.

2.1 Areas to be managed for nuclear projects

In carrying out the decommissioning project, a number of various areas are expected to be managed, and the responsibilities and roles of various organization are related. In general, as IAEA guidance, areas to be managed in general projects and areas to be considered in the decommissioning of nuclear facilities are presented.

Table I: Areas to be managed for nuclear projects [1]

Generic PM areas	Nuclear specific PM areas
▪ Integration ▪ Scope ▪ Time ▪ Cost ▪ Quality ▪ Human resources ▪ Communications ▪ Stakeholders and interested parties ▪ Risk ▪ Procurement ▪ Health, safety & environment ▪ Lessons learned and operating experience	▪ Radiation dose and radioactive waste management ▪ Licensing ▪ Emergency planning and response ▪ Security and safeguards

12 contents are suggested as general PM areas, and the management of risk, procurement, safety and health, etc. will be related to the contents of work procedures in the existing operation. Additionally, 4 contents are suggested as the areas to be managed in nuclear specific PM areas. In this aspect, for the management of the decommissioning project, it will be necessary to differentiate it from the general PM in radiation area access and dose control, tracking of decommissioning waste, and dismantling progress management.

2.2 PM areas in DecomExpert

As an overseas experience in decommissioning project management, we can refer to the scope of DecomExpert of the Trojan integrated cost and schedule control system. Comparing the management scope of the DecomExpert system and the PMBOK areas, it can be summarized as the table below. This management system was largely used for the scope of integration, scope, cost, human resources, communication, risk, and procurement, and it can be seen that there are several subdivided contents in particular in cost management.

Table II: Contents of DecomExpert system [2]

PMBOK	DecomExpert areas
Integration	▪ Support for cost analysis based on assumptions in the project planning phase ▪ Change requests can be integrated in the planning phase ▪ Use as a project information system
Scope	▪ Used as a data storage for WBS, OBS, and CES

	▪ Reduce labor costs with and cost-benefit analysis
Cost	▪ Provides detailed list of resources linked to unit cost factor ▪ Extract the time-consuming resources ▪ Reference when establishing cost estimating methodology ▪ Estimated, budgeted and actual cost reporting ▪ Provide cost management tool ▪ Possible to extract cost analysis data
Human resources	▪ Personnel allocation planning and maintenance management
Communication	▪ Central storage of project information ▪ Distribution of project information ▪ Performance reporting
Risk	▪ Cost analysis and risk assessment
Procurement	▪ Contract management

2.3 Areas managed in DECOMMIS

In Korea, there is experience of decommissioning research reactors, and DECOMMIS is the system introduced for the project information management. The system is composed of two functions: a decommissioning data input system (DDIS) and a decommissioning data processing and output system (DDPS). The table below summarizes the areas and related data managed by the system. It indicates that work details, manpower consumption, radiation protection, and waste management are major consideration in decommissioning project as important tasks. It can be seen that the management of data on the waste and radiation protection is important as it is the scope of works in the projects similar to other cases.

Table III: DECOMMIS work areas and data inputted [3]

Work areas	Daily generation data
▪ Work details (D&D)	▪ Name of project ▪ Summary and remarks ▪ Detail description of all activities
▪ Project	▪ Manpower consumption
▪ Radiation Protection	▪ Personal exposure dose ▪ Monitoring of working condition ▪ Surveillances of space activity
▪ Waste management	▪ Solid waste ▪ Liquid waste ▪ Ventilation system operation
▪ QC	▪ Qc activities
▪ Technical support	▪ Technical supporting activities
▪ Common	▪ Environment management ▪ Internal/external training

2.4 Decommissioning integration system

The study contents were reviewed as a systematic approach to project management for the decommissioning of nuclear power plants. Some of the areas to be considered include IAEA guideline or management areas of overseas cases. Therefore, the scope of considered as the areas to be managed in nuclear projects is as follows [4].

- Waste tracking management
- Organization & human resources
- Scope management
- Quality management
- Cost management
- Time (schedule) management
- Risk management
- Stakeholder management
- Safety culture

3. Conclusions

In Korea, decommissioning of nuclear power plants will be initiated in the near future. Accordingly the establishment of project management areas need to be determined through the projects undertaken in existing operations and construction or form the overseas experiences. The scope of works for various cases was different depending on the characteristics of each project and their internal procedures, but it was seen that there was also common areas for the nuclear decommissioning project management such as work progress and schedule, radiation protection, waste tracking, and D&D work control. Especially, the management of radioactive waste is the essential scope of work that should not be left out in the management of the decommissioning project. We hope that the contents reviewed in this study can be utilized as reference data to be considered while preparing for nuclear decommissioning project.

REFERENCES

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