

A Review on Integrated Management Procedure for NPP Decommissioning Project

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1. Introduction

The management of a nuclear facility project throughout the life cycle of construction to decommissioning has proved to be a challenging task, especially as a new area of the decommissioning in Korea. Given the specifics of nuclear technology, management of nuclear project is not just about delivering a facility and its associated physical infrastructure. It is also about delivering a sustainable solution that can be safely, securely and reliably managed throughout its life cycle. Therefore, the purpose of this study is to review a structured framework for the management of nuclear projects from their initiation to the end. In addition, information on the impact of stakeholders due to the decommissioning and related problems of the decommissioning project owner was analyzed and described.

2. A Project Management Approach to NPP

Project management is sometimes referred to as the process of ‘making sure everyone else is doing his or her job in a concerted manner’. This oversight and coordination role is referred to as project ‘integrated management’ [1]. Personnel working on projects need to manage a number of diverse areas and report to many different individuals and organizations.

This section describes the main items that are to be managed for the nuclear project and the tools available as shown in Fig.1.

Generic Project Management Area	Nuclear Project Management Area
Integration	Radiation effect & Radioactive waste management
Scope	Licensing
Time	Emergency planning
Cost	Security & safeguards
Quality	
Human resources	
Communications	
Stakeholder	
Risk	
Procurement	
Health, safety & environment	
Lessons learned	

Fig. 1 Generic Nuclear Project Areas

2.1 Implementation Plan

During the preliminary phase of a facility’s planning, it is not expected that the project planning would be very detailed. However, there will be gradual specific planning for controlled project progress. Therefore, it becomes more detailed as the project proceeds through the each stage.

Typical construction project plan is shown in Fig. 2. The same can be applied to decommissioning project, and not all the content are required. It is because changes are inevitable during any large project. Changes should not necessarily be seen as a cause for concern, but if effectively managed, as opportunities to improve the project.

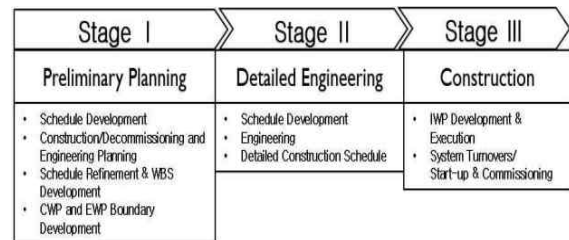


Fig. 2 Integrated construction project plan flow chart

It requires an effective flow of information from planning to construction. To do this, There is a need to focus on the specific boundaries and dependencies between various construction work packages (CWPs) and engineering work packages (EWPs).

2.2 PBS, WBS and CBS Preparation

In basic, the precise activities and deliverables to be provided by the project are typically documented and controlled through the use of a plant breakdown structure (PBS) and a work breakdown structure (WBS). The PBS is a breakdown structure of physical components of a project. A complete PBS helps ensure that all physical components of a project are accounted for within the project scope.

The particulars of any owner’s scope (work to be executed by the owner) and any detailed owner’s requirements for the project should be included.

Functionality should be included in the PBS to extend it to lower levels of breakdown as the project becomes defined in more detail. Fig. 3 illustrates how the PBS and typically physical room are linked in NPP.

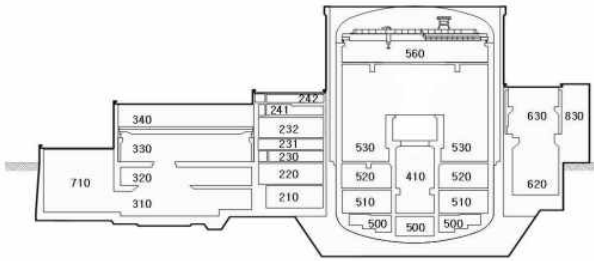


Fig. 3 Sample Physical Breakdown Structure (PBS) for NPP Project

The WBS is a tree structure that divides a project into phases, deliverables and work activities. It specifies what will be done, not when or how. As is the case with the PBS, the WBS should include the functionality to be extended to lower levels as the project is defined in more detail. Table 1 provides a sample simplified WBS for NPP project.

Table 1: Sample Work Breakdown Structure(WBS) for NPP Project

Index	Activity
1. Project management	<ul style="list-style-type: none"> • Project development • Project reporting • Project control • Project estimates
2. Engineering	<ul style="list-style-type: none"> • Mechanical • Electrical • I&C • Civil • Third party review
3. Regulatory affair	<ul style="list-style-type: none"> • Site preparation license • Construction license • Operation license • Conventional approvals • Progress reporting
4. Construction	<ul style="list-style-type: none"> • Site preparation • Nuclear island • Conventional island
5. Commissioning	<ul style="list-style-type: none"> • Civil • Mechanical • Electrical • I&C • Plant start-up tests
6. Procurement	<ul style="list-style-type: none"> • Long lead • Construction material • Contracts

These are normally defined as ‘activity specifications’ or a ‘WBS dictionary’. The project schedule, budget and resource plans can become more improved as these specifications become known for all of the WBS elements.

Cost breakdown structure (CBS) is a hierarchical definition of the key cost elements of a project. These include labor, materials and other direct and indirect costs. For a complex project there is many sublevels of

these major elements below the high level divisions. The CBS allows for the tracking of project costs and helps to evaluate the effectiveness of the estimate versus the work in place, remaining work and overall costs.

2.3 Stakeholders Relevant to the decommissioning process

Under the experienced overseas, Facility owners starting a decommissioning project have also found it useful to distinguish among various segments of their stakeholders [2]. Within each category the areas of interest and concern specific for stakeholders involved can be identified, as shown in Fig. 4.

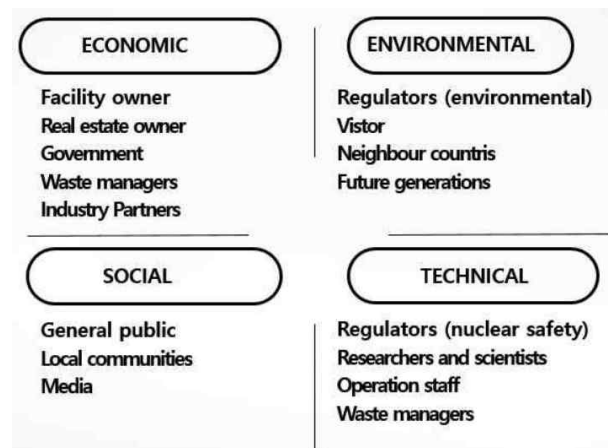


Fig. 4 Stakeholder Primary Area of Interest or Concern.

3. Conclusions

Development of integrated project processes for activities in decommissioning phase is a lengthy process. A key role of the owner is to ensure that all of the required resources are available to support these activities when they become needed. Therefore, at the beginning of decommissioning phase, even while preparing for the decommissioning process, the licensee needs to begin developing the expertise to support dismantling activities.

The concept of PBS, WBS and CBS can be used as inputs to the planning for new decommissioning project, and can help to understand or reduce risks or time.

These efforts will help to get a new decommissioning NPP project started.

REFERENCES

- [1] IAEA, Organization and Management for Decommissioning of Large Nuclear Facilities, Technical Reports Series No. 399, International Atomic Energy Agency, VIENNA, 2001.
- [2] IAEA, An Overview of Stakeholder Involvement in Decommissioning, Technical Reports Series No. NW-T-2.5, International Atomic Energy Agency, VIENNA, 2009.