Preliminary Study on Virtual Waste Package Concept Associated With Consolidated Configuration Management for Decommissioning of Nuclear Power Plant

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1. Introduction

Configuration management (CM) in nuclear power plants (NPP), is process of ensure that the construction, operation and maintenance in NPP comply with design standards for safe opearation. CM has been emphasized minimizing a nuclear accident, such as nuclear breakdown, corruption and the problem of the complement system in the meantime in Korea. However, the CM that intended to pursue in Korea does not consider decommissioning of NPP. IAEA recommands that CM of NPP is important not only for the operation but also for the decommissioning. Therefore, this study proposed the concept of Consolidated CM and the concept of Virtual Waste Package that considers from design to decommissioning for safe operation and decommissioning of nuclear power plant.

2. Configuration Management of Decommissioning

2.1 Application of Configuration Management in Nuclear Power Plant (IAEA)

IAEA specifies the goal of CM is to understand and maintain the design basis consistent with licensing basis. In addition, decommissioning plan should be created based on the design and operational requirements at that time. Consequently, it is important to track the information through CM from the time it was first designed to the point of decommissioning.

2.2 Concept of Consolidated Configration Management

Operator of NPPs, KHNP Co., Ltd in Korea is being construct CM system. EMD is managed as part of CM, and is managed by 7 items as shown in Table 1 below. Each item is divided into detailed items, all of which are tracked for safe operation of the NPP.

Table 1. Contents of Equipment Master Data (EMD)

Information		Basic information management items
1. Basic	→	1.1. Feature Location
2. Quality		1.2. Feature importance decision
3. Production		
4. Department		1.3. Location
5. Size		1.4. Radiation Location Information
6. BOM		1.5. Blue print
7. Etc.		1.6. Maintenance

The IAEA recommends that the CM of NPP be maintained from design to decommissioning. However, CM for decommissioning is different from that of operation management in that it is

specified as a special challenge. Items to be managed for disposal as radioactive waste in EMD management items are not considered. Items to be managed to dispose of radioactive waste are physical, chemical, and radiological information and can be identified through the Waste Acceptance Criteria. There is a need to consolidate the CM list for operation management and the CM list for disposal waste management for complete CM, and present it as a concept of consolidated CM.

3. Virtual Waste Package Concept

If the physical, chemical, and radiological characteristics of the NPP are analyzed in addition to the EMD, the decommissioning waste inventory can be estimated more accurately when the NPP is dismantled. Therefore, concept of virtual waste package (VWP) is proposed in this study. The concept of VWP can consider of decommissioning at the design and operation stage. It analyzes the design data of NPP to predict the amount of radioactive waste generated during decommissioning. When using VWP concept, it is possible to predict radionuclides inventory either by using data from FSAR or code modeling. In order to apply VWP more practically in decommissioning, CM should be performed well in operation stage. Moreover, if the data is continuously maintained, more safe and economical decommissioning will be possible.

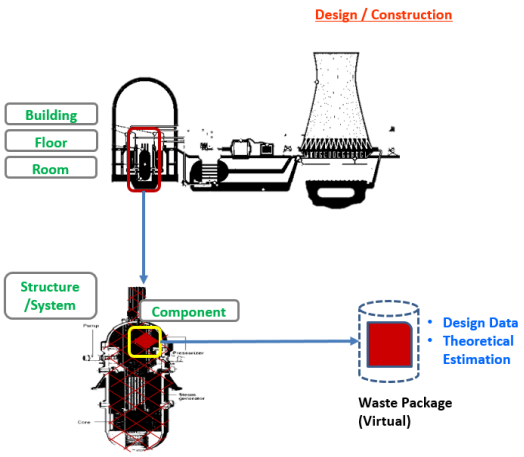

Fig. 1. Virtual Waste Package Concept.

4. Conclusion

In order to apply efficient consolidated CM, it is necessary to decide when to apply configuration management for disposal waste management, and determine the level of depth to apply CM. It is also necessary to determine the extent of application of disposal waste management. Through the VWP concept in this study, the decommissioning planning through design and operation information will be more accurate.

REFERENCES

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