Analysis of International Standards and Guidelines for Optimal Management of Decommissioning Waste and Its Implication

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1. Introduction

June 2017, as the first commercial Nuclear Power Plant(NPP) Kori Unit 1 is permanently suspended, it is expected that the preparation for the decommissioning of NPPs in Korea will needed. KHNP is proposing a challenging goal of disposing 14,500 drums per Unit through minimization of Decommissioning Waste(DW).

Nuclear-related institutions and national regulatory agencies are establishing regulation for optimal managements of DW and responsible for ensuring that the needs of the operator can meet legal requirements through rules and guidelines. Therefore, this study proposes measures to facilitate decommissioning by researching and analyzing the regulations of 8 institutions and countries for optimal management of DW from generation to disposal.

2. Analysis of Relevant Regulations

In this study, prior research of the optimal regulatory management of DW by major institutions and countries were investigated and analyzed them in three categories. The state of application of each institutions and countries is shown in Table 1 below and in Korea, regulations are managed to the same level as the IAEA's recommendation on DW through laws and regulatory agencies [1][2].

Table 1. The State of Application for Institutions/Countries

	IAEA	EC	WENRA	USA	UK	FR	JP	KR
RW Source Reduction	○	○	○	○	○	○	○	○
Prevention of Contamination Spread	○	○	○	○	○			○
Recycle and Reuse	○	○			○	○	○	○

2.1 Radioactive Waste(RW) Source Reduction

Minimizing waste generation means minimizing the generation of radioactive waste during operation and decommissioning phase through proper design and operation. All 8 institutions and countries surveyed have specified the minimization of waste generation through guidelines and recommendations

2.2 Prevention of Contamination Spread

Prevention of contamination spread is to prevent the spread of radioactive contamination, thereby reducing the needs for decontamination and minimizing the generation of secondary wastes including byproducts from treatment process. As shown in Table 1, 6 out of 8 institutions and countries specify the prevention of contamination spread.

2.3 Recycle and Reuse

6 Institutions and countries, including IAEA,

specify recycling and reusing in their guidelines and recommendations, and suggest that recycling and reusing through characterization is one of the most important strategy in terms of minimizing DW. In the case of France and Japan in particular, it aims for restrict recycling and reusing in the nuclear industry.

3. Results and Discussion

3.1 DW Management Flow Chart

Based on the DW management flow chart proposed by the optimal regulation management for each institution and country, this study propose a flow chart for DW management considering the domestic situation, and some of them are shown in Figure 1 [3].

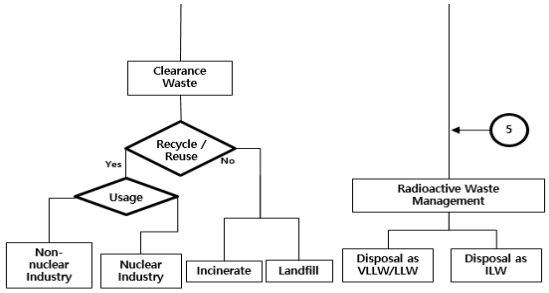

Fig. 1. DW Management Flow Chart (Extract).

3.2 History Management System linked with Configuration Management(CM)

To ensure facilitate of decommissioning, history management is required from the design and operation stage to characterize the DW. KHNP carries out CM through Equipment Master Data of material and equipment IT system to ensure safe operation of NPP and prevent irregularities, it is considered that some of the CM items managed during operation can be utilized in the history management system for DW at the decommissioning stage.

4. Conclusion

This study investigates and analyzes the regulations of eight institutions and countries for the optimal management of DW and proposes the methods to improve the facilitate of decommissioning as a flow chart of DW management for minimizing wastes and a history management system for DW that linked with CM for the efficient waste characterization.

On the other hand, there is case where asphalt using materials below the clearance levels is removed (Songpa-gu, Seoul) and controversy over the recycling of Non-RW to road paving foundations (Uiwang, Pocheon). Therefore, it is necessary to consider way of recycling the items with low average frequency of exposure to the public through recycling in the nuclear industry considering public acceptance.

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REFERENCES

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