

Potential Management Options of Radioactive Large Metallic Components From NPPs in Operation and Decommissioning

Jin-ho Park, Jae hak Cheong*, and Joo-ho Hwang

KyungHee University, 1732, Deogyong-daero, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea

*jhcheong@khu.ac.kr

1. Introduction

Today, in Korea, large component generated by replacement during operation from nuclear power plant is stored in the temporary storage facility. Also, as the dismantling of the nuclear power plant progresses, a larger amount of metal radwaste will be generated. However, the management option of large component generated in this way has not been decided. Therefore, it is necessary to derive a transport scenario for selecting the optimum treatment/disposal plan.

2. Management scenario

2.1 Current state of treatment/disposal of large component

The domestic steam generator generated by the replacements during the operation, although there are transporting experiences inside the NPP, it is actually not yet transported outside.

There is a case that has been brought the original form to the disposal facility if overseas, and there were cases in which large component was temporarily stored/disposed after cutting or melting treatment. The method of treatment/disposing of international large component can be seen by seeing Table 1 below.

Table 1. Current state of treatment/disposal of large component abroad

Country	Material	Radwaste form	Transport mode
U.S.A	RPV	Original shape, Cutting	Truck+barge, Truck+Rail
	SG		
	PZ		
Germany	RPV	Original shape, Cutting, Melting	Truck+rail, Private ship
	SG		
	PZ		
Sweden	SG	Melting	Private ship

2.2 Scenario selection factor for large component transport

2.2.1 Transport method. Transport methods can basically be distinguished as land and marine. In the case of land, it can be divided into railroads, trucks and the like. In the case of sea, it can be classified as dedicated vessel or barge.

2.2.2 Transport form and treatment facility. Large component is bulky and heavy, so it can be transported in its original shape, but it may take a lot of restrictions. Depending on the situation, the shape can be deformed through work such as cutting or melting through the treatment facility, and the volume can be reduced or the weight can be reduced and conveyed.

2.3 Large component transport scenario

In the transport scenario of large component, it

was divided into two routes, land and sea. Truck in the case of land transport, only the method using the private ship on the sea was considered.

2.3.1 Transport form and treatment facility.

Schematic diagrams of land and sea scenarios are the same as in Fig. 1 below. In the case of the treatment facility, it was classified into the on-site facilities of NPP and off-site facilities of NPP, and selected for transport to the disposal site.

2.3.2 Transport form and treatment facility.

The transport scenario was the same as in Fig. 2, and a total of 11 scenarios were selected, separated by land and sea.

3. Conclusion

In this paper, we selected a scenario for

treatment/disposing of large component. Based on this scenario, we expect to be able to derive the optimal scenario for large-scale metal waste disposal/disposal when risk assessment and economic analysis etc. are additionally executed.

REFERENCES

- [1] Consultation on the Site for Interim Storage of ILW - Supporting Information on RPVs and RPV store, Nov., 2014.
- [2] AEN NEA, The management of large components from decommissioning to storage and disposal, 2012.
- [3] Disposal of steam Generators from Decommissioning of PWR Nuclear Power Plants, IYNC 2008.

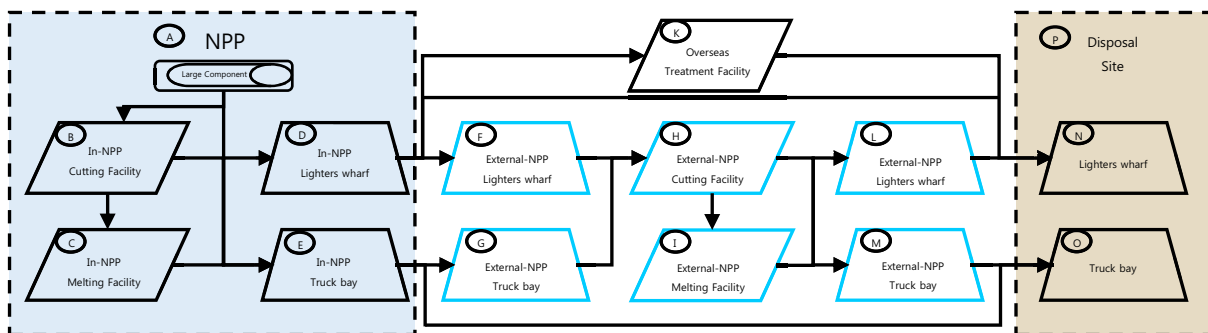


Fig. 1. Schematic diagrams of land and sea scenarios.

Scenario #	Overland transport	Scenario #	Marine transportation
#1	A → E → O → P	#6	A → D → N → P
#2	A → B → E → O → P	#7	A → B → D → N → P
#3	A → B → C → E → O → P	#8	A → B → C → D → N → P
#4	A → E → G → H → M → O → P	#9	A → D → F → H → L → N → P
#5	A → E → G → H → I → M → O → P	#10	A → D → F → H → I → L → N → P
		#11	A → D → K → N → P

Fig. 2. Transport scenario.