Comparison of Radioactive Waste Generation in Various Nuclear Fuel Cycles

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ABSTRACT

This study was focused on radioactive waste volume generated in various fuel cycles, which could be one of measures of effectiveness of the waste management, and then their radioactive waste disposition costs were estimated. A total of five fuel cycle options including DUPIC fuel cycle, PWR once-through cycle and HWR(Heavy Water Reactor) once-through cycle were considered in this study. It found from the radioactive waste volume estimation that the DUPIC fuel cycle could have lower volumes for milling tailings, low level waste and spent fuel than those of other fuel cycle options. However, for intermediate level waste, the DUPIUC fuel cycle option has a little higher waste volume than that of the PWR once-through but lower than that of thermal recycling(PWR-MOX) option. From the results of the disposition cost analysis, this study found that the DUPIC waste disposition cost was the lowest among fuel cycle options. It means that if the total waste disposition cost is used as a proxy for quantifying the easiness or difficulty in managing wastes, the DUPIC option actually make waste management more easy.