Contribution ID: **34** Type: **Oral**

Reduction of geological disposal area by introducing partitioning technologies under conditions of high burn-up operation and high content vitrified waste

Thursday, 27 June 2019 12:20 (20 minutes)

In the geological disposal of high-level radioactive waste, the amount and properties of waste buried deep underground depends on various process conditions, starting with nuclear fuel. To reduce the environmental load of geological disposal, we evaluated the effects on vitrified waste heat generation of fuel burn-up, spent fuel cooling period, separation of heat-generating nuclides, and waste loading of vitrified waste, which are closely related to the design of the repository. The timing of the appearance of the maximum temperature of the buffer material in the repository depends on the heat-generating nuclides, including short-lived nuclides Cs and Sr and their daughter nuclides and long-lived minor actinides contained in vitrified waste. The generation and accumulation of these nuclides is related to the fuel burn-up and the cooling period of the spent fuel. We examined the effect of the minor actinide separation ratio, which is related to the spent fuel cooling period, on the waste-occupied area in repository to reduce the amount of vitrified waste with high loading, assuming that molybdenum and platinum group metals were separated. Based on these results, the idea of cross-sectoral and integrated research on spent fuel, nuclide separation, vitrified waste, and geological disposal was examined to present technical options that contribute to load reduction in geological disposal.

Do you wish to enter the YGE SFM19 Challenge?

Yes

Country or International Organization

Japan

Primary author: OKAMURA, Tomohiro

Co-authors: MINARI, Eriko; NAKASE, Masahiko; ASANO, Hidekazu (RWMC/TokyoTech); TAKESHITA, Kenji (Laboratory for Advanced Nuclear Energy, Tokyo Institute of Technology)

Presenter: OKAMURA, Tomohiro

Session Classification: Session 5.2

Track Classification: Track 5: Impacts of advanced nuclear energy systems on the back-end of the fuel cycle