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Radioactive Waste Management, its Global Implication on Societies, and Political Impact

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Reprocessing plant in Rokkasho, Japan is under commissioning at the end of 2008, and it starts soon to reprocess about 800 Mt of spent fuel per annum, which have been stored at each nuclear power plant sites in Japan. Fission products together with minor actinides separated from uranium and plutonium in the spent fuel contain almost all radioactivity of it and will be vitrified with glass matrix, which then will fill the canisters. The canisters with the high level radioactive waste (HLW) are so hot in both thermal and radiological meanings that they have to be cooled off for decades before bringing out to any destination. Where is the final destination for HLW in Japan, which is located at the rim of the Pacific Ocean with volcanoes? Although geological formation in Japan is not so static and rather active as the other parts of the planet, experts concluded with some intensive studies and researches that there will be a lot of variety of geological formations even in Japan which can host the HLW for so long times of more than million years. Then an organization to implement HLW disposal program was set up and started to campaign for volunteers to accept the survey on geological suitability for HLW disposal. Some local governments wanted to apply, but were crashed down by local and neighbor governments and residents. The above development is not peculiar only to Japan, but generally speaking more or less common for those with radioactive waste programs. This is why the radioactive waste management is not any more science and technology issue but socio-political one. It does not mean further R&D on geological disposal is not any more necessary, but rather we, each of us, should face much more sincerely the societal and political issues caused by the development of the science and technology. Second topic might be how effective partitioning and transformation technology may be to reduce the burden of waste disposal and denature the waste toxicity? The third one might be the proposal of international nuclear fuel centers which supply nuclear fuel to the nuclear power plants in the region and take back spent fuel which will be reprocessed to recover useful energy resources of uranium and plutonium. This may help non proliferation issue due to world nuclear development beyond renaissance.