Spent Fuel Management and Storage in Korea

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Currently, Korea's nuclear power program has twenty operating power plants consisted of four CANDU and sixteen pressurized-water reactors (PWR). And 8 plants are under construction. At the end of 2009, the total amount of spent fuels accumulated at these reactor sites was up to about 11,000tHM. According to the Governmental Long-Term Plan for Electric Power Demand and Supply, total 32 NPPs will be in operation by 2022.

Such an active nuclear energy program, however, has inevitably produced significant quantities of spent fuel. The amount of spent fuel generated in Korea is sharply increasing with time and the cumulative amount of spent fuels, which is expected to increase up to 20,000 ton by 2020. Of those, CANDU spent fuel accounts for more than 60% of total amounts.

National policy for radioactive waste management is determined by Atomic Energy Commission(AEC). According to 253th AEC's decision, spent fuels will be stored at plant sites until 2016. Future national policy for spent fuel management will be decided through public participation taking into consideration of national/international trends on policy and technology development.

At present, all spent fuels are stored in temporary storages at plant sites. All these storage pools currently in operation are expected to reach their full capacity in several years. To resolve the insufficient storage capacity at the plant sites, the storage capacity have been expanded by re-racking and transshipment between the storage pools as short-term solutions. In case of CANDU, spent fuels had been stored in the dry concrete silo since 1991. During the past 15 years, 300 silos were constructed and ~3,200 ton of spent fuels are stored now. New dry storage facility MACSTOR/KN-400 is in operation early 2009.

In addition to these short-term solutions, the government is also laying-out a long-term plan to resolve this issue with the involvement of researchers as well as the public.

In order to resolve the fundamental problem for long-term spent fuel management, Korea started a national R&D program for the development of spent fuel storage technology in 2009. The technology development of the spent fuel dry storage is funded by the radioactive waste management fund which established in Jan.1st of 2009, of which purpose is to develop the key technologies commercially available in the operation of spent fuel dry storage facility to be installed around 2016.

This paper represents the current status of spent fuel management in Korea and introduces the R&D activities for spent fuel storage. Some important characteristics of the spent fuel generated from the Korean nuclear power plant and the Data Base program will included in the presentation.