NUCLEAR OPTION IN KOREA

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Abstract

With sixteen(16) operating nuclear units in Korea, the share of nuclear power generation reached 41% of the total electric power generation as of December 2000. A prediction is that it would further increase to 44.5% by year 2015 according to the national long term power development plan. Four units are currently under construction with 6 more units in order. With little domestic energy resource and increasing energy demand to support national economic growth, Korea has chosen nuclear power as one of the major energy sources to ensure stable power supply and to promote energy self-sufficiency. It has been recognized that nuclear power in Korea is not a selective option but rather a necessity.

The Korean nuclear power development started with construction of a 600 MWe size reactor that was designed and constructed by foreign vendors. As the national grid capacity became larger, the size of nuclear units increased to 1000 MWe class. In the mean time, the need for nuclear technology self-reliance grew not only in operation and maintenance but also in construction, manufacturing and design. For this, a nuclear technology self-reliance program has been embarked with the support of the Government and utility, and the 1000 MWe class KSNP(Korean Standard Nuclear Power Plant) has been developed. The KSNPs are currently being designed, manufactured, constructed and operated by relevant Korean entities themselves.

To fit into a larger capacity national grid and also to improve nuclear economic competitiveness, the 1400 MWe class KNGR(Korean Next Generation Reactor) design has been developed uprating the 1000 MWe KSNP design. Its construction project is currently under contract negotiation, and is planned to be finished by 2010. In the mean time, to be ready for future electric power market deregulation, the 600 MWe class small KSNP design is being developed downsizing the KSNP. A modular small size reactor, SMART(System Integrated Modular Advanced Reactor) is also being developed, that can be utilized for

desalination and electric power production purposes.

The Korean nuclear power program has significantly contributed to Korean economic growth. Other contributions by the program that also need to be recognized are :

- diversity of energy resources for energy security
- energy self-sufficiency
- technology self-reliance
- establishment of industrial infrastructure
- reduction of environmental impact such as CO_2 gas emission.

To further promote the nuclear power program in Korea, the following challenges should be properly taken care of:

- economic competitiveness compared to non-nuclear resources
- waste management
- public acceptance
- maintaining young engineers.

Key words

energy option, technology self-reliance, nuclear power program