

Korean Views on Needs for International Cooperation in Development and Deployment of Advanced Nuclear Power Systems

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Korea is implementing a major nuclear power development programme because nuclear power offers major advantages such as lessening its dependence on imported oil, diversification of energy sources, stability of supply, economic viability and environmental protection. After Chernobyl accident in Russia and recent democratization in Korea, however, nuclear power is increasingly becoming a public acceptance issue. Hence development and deployment of safer and more reliable Advanced Nuclear Power System (ANPS) have been recognized as necessary efforts to enhance public acceptance.

Korea methodology and experience in international cooperation in the fields of construction and operation of NPP, safety regulations and licensing, and R&D are also presented. International cooperation may be classified into two categories, (a) commercial and proprietary cooperation for utility companies and related industries, and (b) open/public sectors cooperation for safety-related research institutes and government agencies.

Korea's Atomic Energy Commission (AEC) is the highest-level policy-decision and coordination body concerning the peaceful use of atomic energy. AEC's main activities are related to nuclear energy utilization, regulations and licensing, allocation of R&D expenditures for nuclear energy related organizations, coordination of nuclear energy utilization activities of related organizations, etc.

KEPCO which is the government-controlled utility is presently sponsoring "Korea's Development of ANPR" and is responsible for this project management. Korea Power Engineering Company (KOEPC), Korea Atomic Energy Research Institute (KAERI) and Center for Advanced Reactor Research (CARR; inter-university collaborative research organization) are jointly collaborating in the ANPR development work. Korea Institute of Nuclear Safety (KINS) is responsible for studying new regulatory and licensing requirements for ANPR development and deployment.

There are two-levels coordinating committees, one being a manager level and the other a working group level. Korea Heavy Industry Company is a supplier of NPP components and equipment.

In 1991 Korean government selected "Development of Advanced Nuclear Power Reactor (ANPR)" as one of top-priority national R&D projects. This near-term development project is presently implemented by industry-university-research institute collaboration under KEPCO's management and funding. The first phase of the Korea's ANPS development project is to improve the standard plant design through incorporating advanced design features. The second phase is to develop an ANPS with the ultimate goal to complete its design by 2001. The first unit of ANPS using this advanced design is expected to be on line after the year of 2007.

For the long-term prospect Korea is expected to develop an Advanced Liquid Metal Reactor (ALMR) that is safe, capable of economic fuel recycle with non-proliferation secured. Based on assessment of the world uranium resources, FBR's economics, trends of foreign countries' R&D programmes, Korea is expected to be in need of ALMR in Korea after 2025.

For most countries with ongoing nuclear power programmes, the needs for international cooperation are different based on the degree of their self sufficiencies in required resources and infrastructures, depending on their country specific requirements. Korea, however, would like to see that a workable international cooperation scheme for ANPS development and demonstration by sharing the cost and risks for such new ventures be set up in order to assure timely development of ANPS.

In the near-term IAEA is expected to play an important role as a promoter as well as a coordinator for development and deployment of ALWR evolutionary and passive NPS by holding IAEA's various technical meetings, symposiums and conferences and establishing safety principles and criteria for ANPS designs.

In the long-term Korea is expected to be in need of an Advanced Liquid Metal Reactor(ALMR) with inherent safety and non-proliferation fuel recycle characteristics. It is proposed that the finishing task for realizing ALMR be undertaken as a major OECD/NEA and/or IAEA project like the Nuclear Fusion development project ITER in addition to IAEA's role for development of ALWR plants as mentioned above.
