Next Generation CANDU© Technology

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The modern CANDU pressurized heavy water reactor is the result of more than 55 years of nuclear technology development in Canada. More than 30 CANDU reactors have been built or are under construction in 7 different countries. However, the CANDU system, like all high technology products, is continuing to evolve to meet the requirements of the coming century.

The high-level strategy for developing the next generation CANDU reactors consists of three main thrusts:

- Cost reductions via plant optimization and simplification
- Safety enhancements with an emphasis on passive safety
- Enhanced Plant Operation using "Smart CANDU" concepts

To achieve the goals associated with the above strategy, advanced knowledge is required from virtually every area of science and engineering that comprises CANDU technology. At the same time, we will preserve the unique CANDU features that provide flexibility for the future, including modular design, high neutron economy, on-power fueling, simple fuel design, and effective passive safety. One example of this flexibility is the ability to use advanced fuel cycles, thus obviating any need to develop new reactor types in the future to deal with the depletion of uranium resources.

The impact of applying new knowledge to the CANDU system will be significant. For example, the cost reductions that result from optimization and simplification would significantly expand the applicability of nuclear power, particularly in emerging markets where the cost of capital is a major factor. This, in turn, would have a major impact on the reduction of environmental emissions (especially greenhouse gases) over the coming decades.

For reasons including the above considerations, we believe that CANDU is the technology of the future. This presentation will examine some of the advanced technologies that will become part of future CANDU designs. It will also explore what we believe to be the full potential for CANDU technology development over the next 25 years.