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The new ACR-700 design

by

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ABSTRACT

AECL has developed the new ACR-700™, to meet market requirements for low cost, reliable energy supplies. The objective was to achieve a capital cost such that the ACR-700 plant will be competitive with alternative options for large-scale base-load electricity supply. Key customer requirements, including enhanced safety, low-operating costs and reliable performance, are being addressed as being equally important as design requirements. This paper discusses the design characteristics of the ACR-700 reference design.

The ACR-700 is an evolutionary extension of the proven CANDU lineage, both the eight units in operation in four countries around the world and the three units currently under construction. These provide a sound basis for projecting highly reliable performance, low project risk and assured costs for the ACR-700. The program includes development and qualification activities that address the new features and design extensions in the advanced plant. For product development and performance assurance, the design features parameters have been carefully reviewed and deliberately selected so as to be well founded on the existing CANDU knowledge base. Planned research and development activities are required only to provide confirmation of the projected performance within a modest extension of the established database. Necessary qualification tests will be carried out within the timeframe of the basic engineering program, to establish a proven design prior to the start of a construction project. This development support work coupled with ongoing AECL programs to support and enhance the performance and reliability of the existing CANDU plants will provide sound assurance that the ACR-700 design will meet customer expectations.

Not only is the specific capital cost of \$1000/kW overnight achievable with the new design, but projected generating costs are competitive with natural gas. In addition extensive use of modern design and construction technology ensures a short project schedule. Enhanced safety is through the provision of increased safety margins and the use of improved and more passive safety systems.

The paper describes both the design and licensing, and the approach to successful deployment in competitive power markets.