

Electric Utility Deregulation - A Nuclear Opportunity

J. R. DeMella
Nuclear Power Economics
Glastonbury Connecticut, USA



XA0203735

The implications of electric deregulation are and will continue to be pervasive and significant. Not only will the fundamental monopoly regulatory concepts of managing electric utilities change but deregulation will have a profound and dramatic impact on the way electric generating plants are managed and operated.

In the past, under the various approaches to financial regulation, the economic benefits normally attributed to competition or that would have otherwise been derived from competitive or open market forces, were assumed to be embodied in and inherent to the various processes, methods and principles of financial oversight of utility companies by regional, state and municipal regulatory authorities.

Traditionally, under the various forms of regulated monopolies, a utility company, in exchange for an exclusive franchise to produce and sell electricity in a particular region, was obligated to provide an adequate supply to all consumers wanting it, at a price that was “just and reasonable”. The determination of adequate supply and reasonable price was a matter of interpretation by utility companies and their regulators. In essence, the ultimate economic benefits, normally attributed to price equilibrium, in balance with supply, demand and other market forces, were expected to be achieved through a complex, political process of financial regulatory oversight, in which utility companies were usually reimbursed for all annual expenses or their “cost of service” and additionally allowed to earn a “reasonable” rate of return on plant investments.

The result was often escalating electric prices, over supplies of electric capacity, by justifying unnecessarily high reserve margins based on long planning horizons (typically 20 years or greater) with extrapolated demand requirements that were generally in excess of what actually occurred over time.

Although the regulatory process varied from country or country and region-to-region, the fundamental principles, which influenced and ultimately determined the price or tariffs for electricity to customers, were generally the same. Utilities revenue requirements were founded upon complex “cost of service” formulas which emphasized and allowed the recovery of all “reasonable” costs including operating expenses, taxes, depreciation of investments and additionally assured a reasonable rate or return on all outstanding investments.

The consequence was that, through regulation of electric rate design, the ultimate price of electricity was determined by the aggregate of costs to produce it, independent of the forces of supply and demand.

Through the examination of the major principles and features of regulated compared to unregulated electric markets such as the “obligation to serve” and the “cost of service”, this presentation will address and discuss the economic opportunities and risks associated with nuclear power plants operating in deregulated, competitive electric generation markets.

In transitioning to competitive markets, a number of key economic questions will be raised that will emphasize nuclear plant economic requirements for a profitable enterprise, addressing factors such as, plant operating performance, market conditions, energy price, key economic measures, investment opportunities, nuclear asset valuation and plant life extension.

An economic analysis of a recent nuclear power plant valuation study will be presented including a discussion of key input variables, financial assumptions, economic results (see Fig. 1) and a brief demonstration of an interactive, PC based computer model used for the analysis. A similar model, is currently being considered by the IAEA to evaluate the economics of nuclear power plant life extension along with alternative generation approaches.

In closing, a number of short and long term prospects for the future of nuclear power will be discussed including plant life extension and the prognostication of a new electric generation business model concept.

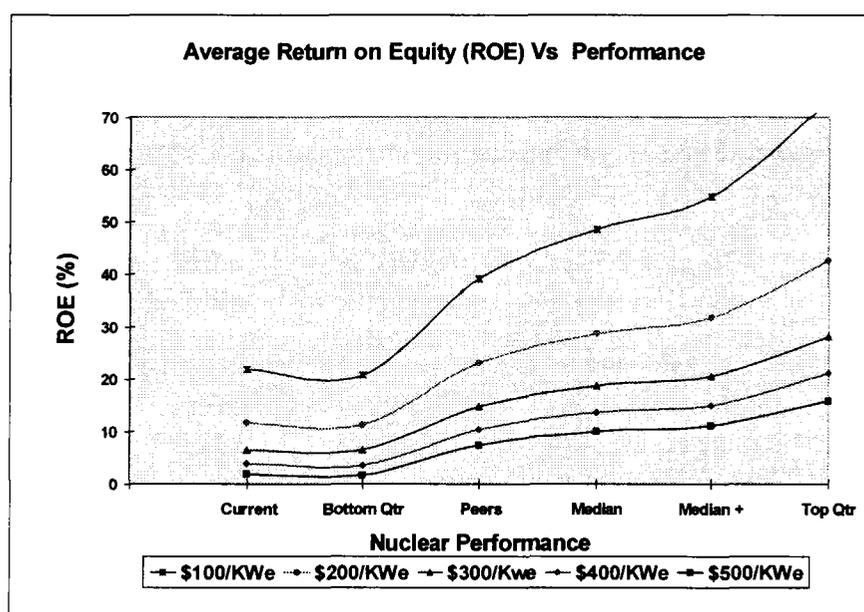


Fig. 1. Nuclear plant investment opportunity, as measured by Return on Investment, for varying levels of plant performance and investment.