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A Nuclear Renaissance?



Just this past weekend, British Energy announced that it is drawing up plans to build future nuclear power plants to replace seven aging advanced gas-cooled reactors (see news story on page 2). British Energy said that rising natural gas costs and worries about future supplies from the North Sea have made nuclear energy more attractive. Is this just the beginning of what may become a global nuclear renaissance, or just premature jubilation?

Over the past few years, the nuclear industry has been rescued from the brink of extinction in the U.S., turning into a prosperous business that has resulted in a competitive market for used nuclear power plants. In three years, the price of used nuclear power plants has increased a hundredfold. As the electricity industry continues to unbundle and consolidate into a new competitive marketplace, the value of nuclear energy will become more apparent. Additionally, license renewal efforts are moving forward at a faster clip and at lower costs than previously anticipated. This results from the fact that the industry has been able to demonstrate that plants do not need to be overhauled to run an additional 20 years due to good maintenance and safety practices.

Now with the existing challenges of the California power crisis, escalating fossil fuel prices and global warming, the market for used and new nuclear power plants are increasing. In discussions about a comprehensive national energy strategy being developed by the Bush White House, nuclear power is being increasingly mentioned. The U.S. nuclear industry is also looking at future subsidies under a bill recently proposed by U.S. Senator Frank Murkowski (R-Ak).

Today, nuclear power plants are certainly

With electricity demand increasing worldwide, nuclear energy is certainly positioning itself to remain an integral part of the future energy mix. Until recently, the U.S. Energy Information Administration (EIA) was projecting U.S. domestic power demand would rise 1.3 percent per year through 2020. But in late November, it increased its forecast by 38 percent, to an annual growth rate of 1.8 percent, citing higher-than projected economic growth and a "re-evaluation of the potential for growth in electricity use for a variety of residential and commercial appliances and equipment, including personal computers." Some experts have said that computers used to power the Internet alone now consume between 8 and 13 percent of all electricity in the U.S. EIA projects electricity usage from PC's in residences to grow 2.8 percent a year and PC usage in offices about 5.1 percent a year.

One of the least understood benefits of nuclear energy by the general public is its ability to meet enormous energy demand while delivering zero-emissions. Because of nuclear power's great generating capability, the cost of replacing nuclear energy with renewable energy sources would be monumental. The ability for nuclear to provide base load capacity and environmental advantages from only a small quantity of fuel is important to meet future increased energy needs without increasing global CO2 levels. Furthermore, the public's concern for cleaner air will continue to grow in the future, making fossil-driven plants less competitive, causing utilities to reconsider nuclear as a competitive option.

While the huge capital investment necessary to build new nuclear plants has kept many utilities from even considering the idea, improvements in technology are fostering a new generation of nuclear reactors that are

operating more efficiently, whereas 20 years ago they were shut-ting down almost as frequently as they were running. The majority of nuclear plants are now operating at ca-pacity factors of 80 percent or higher and have reduced their refueling outages from several months to as little as three weeks. This, in turn, has led to lower electricity production costs. In fact, according to figures from the Utility Data Institute, production costs from U.S. nuclear power plants fell below coal-fired, oil-fired, and natural gas plants in 1999. Nuclear power plants averaged 1.83 cents per kilowatt-hour (kWh) in 1999, compared to 2.07 cents for coal-fired plants, 3.18 cents for oil-fired plants and 3.52 cents for natural gas plants. Average production costs for nuclear power plants have not been this low since the mid-1980's, when mandatory safety improvements caused nuclear to lose its competitive ad-vantage in the U.S.



already becoming available and promise to be quite competitive with newer generations of fossil-based sources. Westinghouse's AP600, a smaller, modular version of the PWR would be cheaper than existing de-signs and take less time to construct. The AP600's capital cost for a twin unit station is expected to be about 15% less than for conventional twin 600 MWe unit sta-tions. Projected operating and maintenance costs are 35% less than the current industry average.

Meanwhile, Eskom's development of the Pebble Bed Modular Reactor (PBMR) has already attracted attention from BNFL in the U.K. and Exelon in the U.S. The PBMR, a 110-megawatt helium-cooled reactor, has a modular design that would give utilities the flexibility to add reactors to sites incrementally as needed. With re-gards to construction, a utility would need to make a \$120 million investment decision instead of a \$2 billion to \$3 billion decision. The PBMR could also be con-structed in 18-36 months instead of around 5+ years with a larger plant. Additionally, the PBMR will have a thermal efficiency of about 40-42 percent, compared with current LWR's at around 28-30 percent. Exelon has already met with the U.S. Nuclear Regulatory Commission regarding potential licensing issues. A de-tailed feasibility study on the PBMR is scheduled for completion in June 2001.

Regardless of whether a "nuclear renaissance" is deemed premature, it is obvious that nuclear energy should remain a vital part of our global energy future. Nuclear power is a strong component of our overall en-ergy mix and more importantly is environmentally friendly. Maintaining existing nuclear generation should be paramount, and expanding it with newer, safer, af-fordable technology should be encouraged.

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