NUCLEAR POWER GENERATION UPDATE

by
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We have a new administration and a new congress coming to Washington and they have a new view of the role of nuclear energy in America's energy mix. The new administration has aggressive goals to reduce our greenhouse gas emissions. Since nuclear generation does not have carbon dioxide as a waste product, nuclear has a place in the energy mix. However, expansion is probably not going to be pursued until the issue of where to store the nuclear waste is addressed.

The U.S. Department of Energy plans to store the spent fuel at Yucca Mountain, Nevada (Figure 1). However, there is opposition, and the project has faced delays. President-elect Barack Obama does not believe that Yucca Mountain is a suitable site and it is unlikely that nuclear expansion will be pursued until another long-term disposal solution is found. Radioactive waste is currently being stored at reactor sites. The security of the nuclear fuel and waste including tracking, controlling and accounting for spent fuel at nuclear power plants are also areas that need to be resolved.

Figure 1. Planned Nuclear Waste Repository

Source: Energy Information Administration

There are 104 licensed nuclear reactors in the U.S. About 20% of the electricity produced in the U.S. comes from nuclear generation. In Louisiana, about 8% of the electricity is produced from nuclear generation.

Nuclear generation has been used in the U.S. for over 30 years and during that time there have been efficiency improvements such that the capacity factor for nuclear power plants has increased from 60% to 90%. However, no new reactors have been ordered since the 1970s. Cost overruns and increased regulatory oversight following the Three Mile Island accident were factors in ending construction of new nuclear facilities. The Three Mile Island Nuclear Station, Unit 2 (TMI-2) accident in 1979 was the most serious in U.S. commercial power plant history.[1] The TMI-2 reactor

[1] The Chernobyl accident in 1986 in the former Soviet Union was the most severe nuclear reactor accident to occur in any country.

is shut down and defueled; however, the accident did not kill or injure anyone inside the plant or in the surrounding community. The regulation of the industry increased after the accident and the nuclear industry in the U.S. has had an excellent safety record since then.

Louisiana has two operating nuclear reactors. River Bend Station is owned by Entergy Gulf States Inc. It is a boiling water reactor, manufactured by General Electric (turbine generator manufactured by General Electric) with a 966 megawatt capacity. Waterford 3 is owned by Entergy Louisiana Inc. It is a pressurized water reactor, manufactured by Combustion Engineering (turbine generator manufactured by Westinghouse) with a 1,157 megawatt capacity.

There are currently 19 potential new commercial nuclear reactor projects in the United States.[2] These projects meet the following criteria.

1. publicly notified the Nuclear Regulatory Commission (NRC) of interest in applying for a combined operating license (COL) to build and operate new commercial nuclear reactors
2. issued one or more press releases or initiated a pre-application meeting at the NRC
3. selected a specific site for the reactor
4. selected a specific reactor design for the project

Entergy Nuclear has two of those 19 potential projects. The application for a combined operating license (COL) for Grand Gulf, MS was submitted in February 2008. In September 2008, a COL application was filed for River Bend, LA. The applications are currently under review by the NRC. Entergy has ordered long lead-time components for use at either Grand Gulf or River Bend. Entergy is seeking the licenses to keep the nuclear option open for the future and has made no commitment to construct a new reactor.

The Energy Policy Act of 2005 includes federal subsidies that will go to the first plants to be built. In particular it provides for loan guarantees up to 80 percent of the project cost. There is some concern that the new Congress will make changes to those loan guarantee provisions. Weak credit markets and higher cost estimates mean that the new reactors may not get built if these incentives are removed. Nuclear projects take approximately 7 to 10 years to construct and the financial risks are an impediment.

Our nation's need for safe, clean, and economical electricity generation continues to grow. There is renewed interest in nuclear power generation resulting from increased demand for electricity, global warming, and concerns over the security of our current energy supply from foreign sources but even though the groundwork for nuclear expansion is underway the financial risk remains an obstacle.

More information on nuclear power generation can be obtained from the following sources:

- Nuclear Regulatory Commission (URL: http://www.nrc.gov/)
- World Nuclear Organization (URL: http://www.world-nuclear.org/info/inf09.html)
- Energy Information Administration (URL: http://www.eia.doe.gov/fuelnuclear.html)

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[2] Energy Information Administration (http://www.eia.doe.gov/cneaf/nuclear/page/nuc_reactors/reactorcom.html accessed 1/6/2009)