Industry Gets Ready to Build New Nuclear Power Plants

by Marsha Freeman

In anticipation of orders from electric utilities for new power plants, the nuclear industry is beginning to make the investments necessary for this coming nuclear renaissance. Although a U.S. utility has yet to order a new power plant, the industry recognizes it must be ready to hit the ground running when orders come in.

Similarly, when President John F. Kennedy announced, on May 25, 1961, that the United States would go to the Moon within the decade of the 1960s, the aerospace industry, in anticipation of participating in this great project, began expanding its facilities months before the space agency had the money to pay them for doing so.

A nuclear renaissance will require reconstituting facilities to manufacture nuclear plant components, facilities that have been idle for more than a decade; expanding currently operating factories that service existing plants; creating the engineering and design centers for the new generation of nuclear plants; and creating the new manufacturing capacity to build standardized plants that will be assembled from modular components. Some of the modular components, industry experts agree, could be produced in the increasingly idle auto and machine tool factories, a concept proposed by Lyndon LaRouche.

Investments must be made to the physical infrastructure of the manufacturing and construction industry, and in parallel, to re-create the manpower needed to design, manufacture, and operate new plants. Already, universities are seeing an increased interest among students to study nuclear science and engineering.

Back in Business

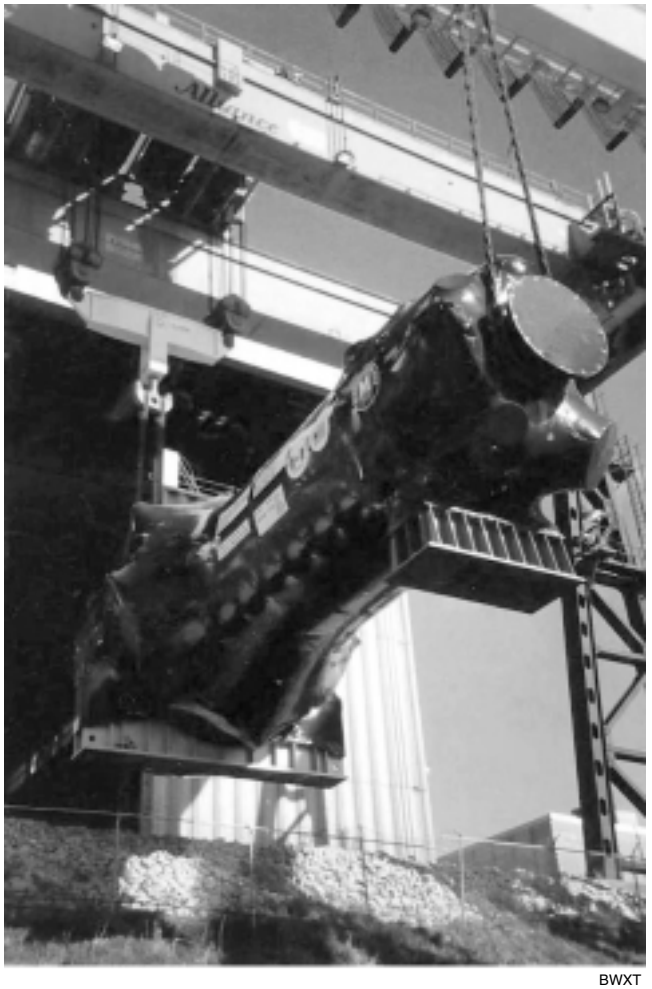
More than 100 years ago, the Babcock & Wilcox company began fabricating boilers for industry, and then for power plants. During the Second World War, B&W designed and delivered 4,100 marine boilers for combat and merchant ships. It provided components, including a 214-ton pressure vessel, for tests during the wartime Manhattan Project, and was awarded the first contract to develop nuclear propulsion systems for the U.S. Navy.

Babcock & Wilcox designed and fabricated reactor systems for the first American commercial nuclear power plant in 1962, at Indian Point in New York, and in its Mount Vernon Works in Indiana and Barberton Plant in Ohio, pressure vessels, steam generators, and other multi-ton power components were fabricated. The Mount Vernon plant, which dates to the 1960s, has been in "standby" mode since the late 1970s, after the collapse in orders for new nuclear power plants.

BWXT, the former Babcock & Wilcox, which is now a subsidiary of McDermott International, had elected in the

BWXT

The only company in the U.S able to build pressure vessels for nuclear reactors, BWXT, formerly Babcock & Wilcox, has refurbished its Mount Vernon, Indiana factory to restart production. Here, a 190-ton pressure vessel is supported by a frame, and can be lifted with one of two 500-ton capacity overhead cranes.



BWXT

A nuclear power plant steam generator is lifted with overhead cranes from the shop floor onto a barge for shipment.

1990s not to renew its nuclear accreditation, which had expired, because the industry had no new orders. But the company has recently decided to make the investments necessary to become accredited for nuclear manufacturing, a necessary step to reenter the nuclear business.

BWXT Nuclear Equipment Division Vice President J. Rod Woolsey remarked in April, when the accreditation was received: "The U.S. commercial nuclear industry is gaining momentum. As the only domestic manufacturer of large, heavy pressure vessels, we look forward to being an active participant in the industry's comeback."

The Next Generation

Although it is necessary to reconstitute the manufacturing facilities that the nuclear industry relied upon to build the 103 nuclear power plants that are in operation today, the reactors that will be built in the future will be standardized, less complex, less fragile, and easier to manufacture, operate, and maintain. All of the major nuclear vendors have designed what are described as Generation III+ reactor systems. Now they must get ready to build them.

In March, Westinghouse Electric Company announced that it was planning to identify, within a year, a new site to house nuclear engineers and technicians, for its expansion into the new nuclear plant market. In 2005, Westinghouse hired 800 people, and it is planning to hire 500 more this year. At least an additional 2,000 will be hired over the next five years, as production of its AP-1000 plant gets under way.

Westinghouse is the only nuclear supplier so far which has had its Generation III+ design certified by the Nuclear Regulatory Commission. A new modular approach and more advanced construction technology will make it possible to build a new plant in 36 months, from the time the concrete is poured, to the loading of the fuel. This faster construction schedule has already been achieved in Japan, and will be possible here, with the new NRC procedures that precertify the design, so the plant cannot be challenged (and thereby delayed) when it is under construction. Such anti-nuclear challenges had stretched out construction times to ten years and more in the past.

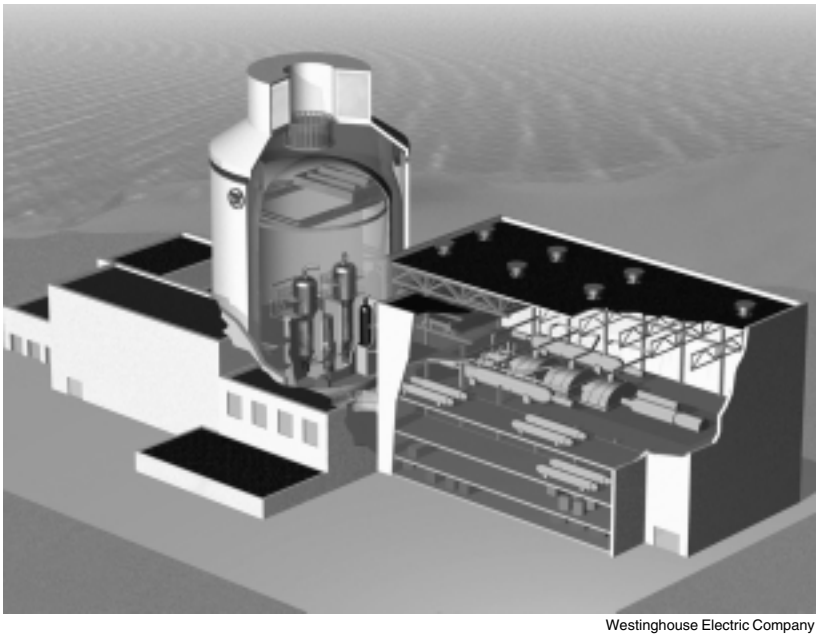
The Westinghouse pressurized water reactors are the most common type of reactor in operation globally, and the company plans to compete for international orders for its AP-1000, including in Great Britain, which recently announced plans to build new nuclear power plants.

The other U.S.-based nuclear vendor, General Electric, is also getting ready for advanced power plant production. GE announced in May that it is expanding its nuclear operations headquarters in Wilmington, North Carolina, with construction of a two-story 40,000-square-foot research and development facility to design its new, Generation III+ Advanced Boiling Water Reactor. After completion this November, at full staffing, the facility will house more than 200 engineers, project managers, and support staff. GE and the state of North Carolina combined are spending $77 million to expand and consolidate nuclear activities at the site.

Recently, GE acquired Ionics Nuclear Fabricated Products, which manufactures spent fuel cannisters and replacement equipment for pressurized water reactors, to add breadth to its capabilities, and it has signed an agreement with Silex Systems of Australia to develop an advanced laser isotope separation process for enriching uranium for use in commercial reactors.

Competition From Abroad

Over the next 12 months, utility and industry consortia will begin submitting construction and operating license applications to the Nuclear Regulatory Commission. They will have an array of more advanced nuclear reactor power plant designs to choose from. How much of the hardware for these new plants will be able to be manufactured in the United States will depend upon how quickly there is a gear-up to reconstitute the U.S. nuclear industry.



Westinghouse Electric Company

The Westinghouse Advanced Pressurized reactor, the AP-1000, will be built using a modular design, and some of its components could be built and assembled in idled auto plants.

There is already intense competition among vendors internationally for the round of orders that is expected over the next few years. European-based Areva and Japanese-based Mitsubishi Heavy Industries are hoping to sell their own Generation III+ reactors here.

Although Areva does not yet have an NRC license to build an Evolutionary Power Reactor (EPR) in the United States, it is the only company that is actually building a Generation III+ plant anywhere in the world: The 1,600-megawatt Olkiluoto-3 reactor in Finland is scheduled to be in operation in 2010.

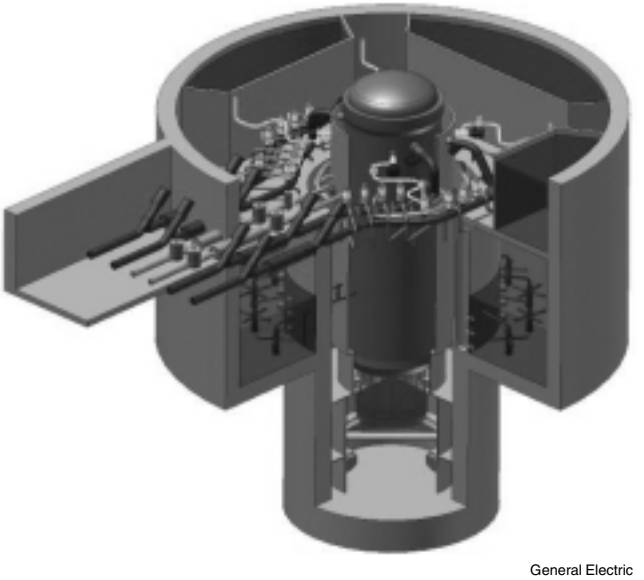
Areva is in the process of preparing its application for design certification with the Nuclear Regulatory Commission, and expects its EPR to be licensed and ready for operation at a U.S. site in 2015. The company operates in 40 locations around the United States, employing 5,300 people, and in more than 100 countries. The recent announcement by the British government that its energy program will include the building of new nuclear power plants, led to an announcement July 10 that Areva will also seek a permit for its EPR there.

The scope of manufacturing capabilities of Japan's Mitsubishi Heavy Industries is extensive. MHI builds nuclear power plants, ships, chemical plants, industrial machinery, aircraft, and rockets. On July 3, MHI Nuclear Energy Systems opened a new office in Washington, D.C., to position itself for sales of an American version of its Advanced Pressurized Water Reactor, or APWR. Mitsubishi Heavy Industries already holds 40% of the U.S. market in the replacement of large nuclear power plant components. It has provided 15 reactor vessel heads, 6 steam generators, and a pressurizer for operating U.S. reactors.

The Mitsubishi APWR is undergoing permit review for the construction of two units at the Tsuruga Power Station of the Japan Atomic Power Company, each of which is 1,538 megawatts. For the U.S. version, MHI plans to increase the power output to 1,700 megawatts by increasing the efficiency of the steam turbine. Of the heat produced by the nuclear reactor, 39% will be extracted and produce electricity, compared to 34% for today's average system. In addition, MHI will design a larger steam generator, and lengthen the fuel rods from 12 to 14 feet for the U.S.-APWR.

MHI expects to receive certification for the U.S.-APWR from the Nuclear Regulatory Commission by 2011, and has begun discussions with the Commission in a pre-application review. The MHI Nuclear Energy Systems Washington office, which is starting off with a staff of 12, will be handling not only the technical process of NRC certification, but activities to attract orders for the U.S.-APWR from U.S. electric utilities.

Looking ahead, the opportunities for U.S. industry are vast: As *EIR* has documented, it will take a full-scale emergency economic mobilization to expand the nuclear industry and construct the needed number of nuclear plants to bring living standards of the developing sector to Western levels.



General Electric

In order to design its next-generation Advanced Boiling Water Reactor, seen in this diagram, General Electric is expanding its nuclear operations in North Carolina.