

insight99

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Unicom, PECO Create Nuclear Powerhouse

Financial Analysts Call Merger a Positive Move for Industry

The consolidation of the nuclear energy industry took a giant step forward last month with the announced merger of Unicom and PECO Energy.

And financial analysts like what they're seeing. "This is the direction the country is going—bringing more nuclear plants under the control of strong operators," says Steven Fetter, Fitch IBCA managing director.

Between them, Unicom's Commonwealth Edison and PECO Energy operate 14 nuclear units. Peach Bottom and Limerick—PECO's nuclear plants—have a legacy of consistently strong performance in terms of capacity factors and economics, says James Asselstine, managing director at Lehman Brothers. Last year, Peach Bottom's average capacity factor—the measure of a plant's actual electrical output vs. its potential output—was 85.3 percent; Limerick's was 84.8 percent. The industry average was 79.6 percent.

Combine PECO's track

record with "the success of Oliver Kingsley—Unicom's chief nuclear officer—in really addressing nuclear

to \$2.60. The reason? For the first eight months of the year, "the company's nuclear capacity factor has averaged

said the investment bank in a monthly newsletter. The average production cost for the nation's 103 nuclear plants in 1998 was 2.13 cents/kWh.

PECO and Unicom are experienced nuclear plant operators, said Corbin McNeill, PECO Energy's chairman, president and CEO.

The two companies already have a strong commitment to nuclear, says Barry Abramson, PaineWebber managing director. "The merger is likely to strengthen it."

Continued on page 2



performance weaknesses at Unicom," says Asselstine, and the result is a "strong and well-positioned nuclear organization going forward." Kingsley was hired from Tennessee Valley Authority in 1997 to turn around the nuclear plants run by Unicom's Commonwealth Edison.

There's no question that Kingsley succeeded. Citing the company's "blow-out nuclear performance" this year, Morgan Stanley Dean Witter raised its 1999 estimate of the company's earnings per share from \$2.50

88.3 percent with average production costs of only [1.53 cents per kilowatt-hour]."

Ongoing Consolidation

Two recent developments—AmerGen Energy's bid for the Oyster Creek nuclear plant and Northeast Utilities' divestiture plan for its nuclear assets—reflect the ongoing consolidation of the U.S. nuclear industry. Nuclear plants are proving their mettle as competi-

tive assets in a restructured electricity market. At the same time, a number of qualified, responsible and experienced companies are expanding their nuclear energy holdings to achieve economies of scale and operating efficiencies.

See AmerGen story on page 6

MERGER from page 1

The new holding company—yet to be named—will command a power generation portfolio of 22,500 megawatts, including nearly 14,000 megawatts of nuclear capacity. That generation is located in two very attractive, competitive markets—the Chicago market in the Midwest and the Pennsylvania-New Jersey-Maryland Interconnection market in the mid-Atlantic, says Lehman Brothers' Asselstine. "Both companies have... either completed, or are well along in marking their nuclear assets to market," he says. In the course of restructuring, companies are valuing their assets at the market value, not the original book value. "As a result," says Asselstine, "the two companies should have a very large component of very low-cost, baseload generating capacity in those two markets—which should translate into strong and stable cash flows."

In turn, that will enhance the company's ability to assume the business risk of acquiring additional nuclear plants, says PaineWebber's Abramson.

SHOPPING FOR PLANTS

The company intends to continue buying nuclear plants, according to Kingsley, who has been named the new chief nuclear officer.

Through AmerGen Energy—its joint venture with British Energy—PECO Energy has already agreed to purchase four nuclear plants and is on the lookout for others. The AmerGen partnership will continue, with the holding company taking PECO's place, said McNeill at a news conference announcing the merger. "This isn't the last merger you'll see," he added.

No question about that,

says Asselstine. But because of the amount of nuclear generation they control, these two companies "will be way out in front in terms of the scale of operation," he says.

Consolidation offers multiple benefits, says Asselstine. One is greater efficiency because of economies of scale. Another is the strong

career paths provided for personnel. And there's also the ability to share best practices within a larger organization. The Unicom-PECO Energy merger will take advantage of all these benefits, he adds.

But success isn't a given. The new company's major competitive edge "will come

from running its nuclear units well," says Fitch IBCA's Fetter. That's a challenge PECO Energy's McNeill and John Rowe, Unicom chairman, president and CEO, are willing to meet head on.

"We intend to be the premier nuclear operator in the nation," says McNeill. ■

TMI 1: A World-Record Plant

How's this for vital statistics?

Three Mile Island Unit 1:

- set a world record for continuous operations of light water reactors—668 days—before it shut down for a refueling and maintenance outage Sept. 10

- achieved a capacity factor—the measure of a plant's actual electrical output vs. its potential output—of 100.2 percent during its last operating cycle
- has had an average capacity factor of 92.4 percent over the past 10 years
- has produced more than 100 million megawatt-hours of electricity since it began operating.

Just What the Doctor Ordered

3-D Model for Radiation Treatment Planning

Meet Virtual Person: a computer-based, 3-D model of the human body. Although it cannot walk or talk, Virtual Person has a far more useful talent. It can become a stand-in for treatment planning for any patient who needs radiation therapy to treat cancer or another disease. Such therapy uses radiation from a linear accelerator or cobalt-60 unit to target a tumor or diseased tissue.

Virtual Person is extremely adept at simulating the effects of radiation on areas of the body—skin, eye lens, bone marrow—that are highly susceptible to radiation. That makes it invaluable in determining effective and safe radiation doses for patients, says Xie George Xu, the creator of Virtual Person.

This is how it will work. Doctors will couple a patient's CT scans and MRI images with a computer simulation program like Virtual Person to develop more accurate treatment planning for diseases that require radiation therapy, says Xu, assistant professor of nuclear engineering and engineering physics at Rensselaer Polytechnic Institute.



Researchers like Xie George Xu are improving the accuracy of radiation treatment planning.

The model itself is very detailed, Xu says. "Most patient images—such as conventional CT scans or MRIs—don't have such detailed information."

Xu expects hospitals to begin using the methodology in the next two to three years. ■

Safe Port in a Storm

Southeast Nuclear Plants Stand Up to Floyd

When Hurricane Floyd roared up the East Coast last month, the nuclear power plants in its path were ready.

"If my house were as well prepared and fortified as the St. Lucie nuclear plant, I wouldn't be worried about my house," Florida Power & Light's Janice Brady said. St. Lucie, located on a barrier island on Florida's east coast, is designed to withstand a Category 5 hurricane with sustained winds of 195 miles an hour.

To prepare, the plant reduced power to 33 percent—which would make it easier to shut down completely if that were necessary. In fact, Floyd dealt St. Lucie a feint, turning north toward the Carolinas—and Carolina Power & Light's Brunswick nuclear plant.

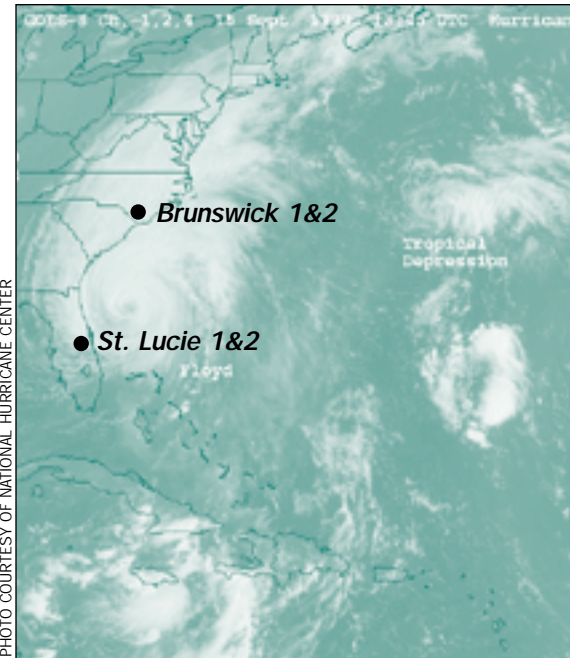
BRUNSWICK TAKES THE BRUNT Brunswick sits at the mouth of the Cape Fear River in North Carolina, and well before the hurricane hit the area, the plant had teams in place to monitor Floyd's progress, staff key functions and ensure an evacuation path was available to the public if needed.

When hurricane force winds were

about two hours away, operators shut down the plant, as required by federal regulation. As Floyd screamed in at speeds of more than 120 miles an hour, it ripped a piece of aluminum siding off the turbine building—but caused no damage to the two reinforced concrete-and-steel containment structures protecting the reactors, which are designed to withstand winds of 150 miles an hour.

In its wake, however, Floyd left severe flooding. As a result, many plant employees couldn't get to work. "So we got creative," said Ann Mary Carley, communications manager. Brunswick contacted the National Guard, explained the situation, and soon Humvees were ferrying plant staffers to the site.

Another East Coast plant—Florida Power & Light's Turkey Point south of Miami—took a direct hit from a Category 4 hurricane, Andrew, seven years ago. The eye of the storm, with sustained winds of up to 145 miles an hour and gusts up to 175 miles an hour, passed over the plant site. Although the plant sustained much external damage, including loss of its communication systems, its safety-related systems were



The nation's nuclear power plants are designed to withstand natural disasters, including powerful hurricanes.

unaffected. The plant is designed to withstand a Category 5 hurricane with winds of up to 225 miles an hour.

In a hurricane, a nuclear power plant is one of the safest places to be. ■

Nuclear Energy Output Soars

The nation's nuclear plants are turning in a stellar performance. Nuclear output was up 9.5 percent for the first six months of 1999, compared with the same period last year. Nuclear plants produced 347.4 billion kilowatt-hours of electricity between January and

June, compared with 317.3 billion kWh for the same period in 1998. If the trend continues, nuclear energy will account for more than 22 percent of all U.S. utility-generated electricity this year. ■

	Nuclear output Jan.-June 1999 (in billion kWh)	Nuclear output Jan.-June 1998 (in billion kWh)	Increase (in percent)	Share of 1999 utility production (in percent)	Share of 1998 utility production (in percent)
U.S. Total	347.4	317.3	9.5	22.3	20.5

Source: Energy Department's Energy Information Administration/Electric Power Monthly, September 1999

A Millennium Retrospective:

The Man Behind the Law That Jump-Started the Nuclear Energy Industry

It was January 1953, and George Norris—nuclear physicist and lawyer—was frustrated. On one hand, he could see the possibilities of the United States generating electricity with a brand new technology called “atomic energy.” On the other hand, he could see the effort stalled, because the federal government maintained absolute control of this exciting new field.

Norris wrote his congressman a letter—attached to a 31-page legal memorandum outlining what he perceived to be the structural obstacles to a vibrant atomic energy program. His congressman happened to be Sterling Cole (R-N.Y.), chairman of the powerful but now-disbanded Joint Committee on Atomic Energy. Norris hoped to combine his two professional loves, while helping move the

nascent industry forward. Six months later, he was on his way to Washington, D.C., as counsel to the Joint Committee.

A year later, Congress passed the Atomic Energy Act of 1954, which permitted private ownership of plant facilities and opened the way for the development of commercial nuclear energy.

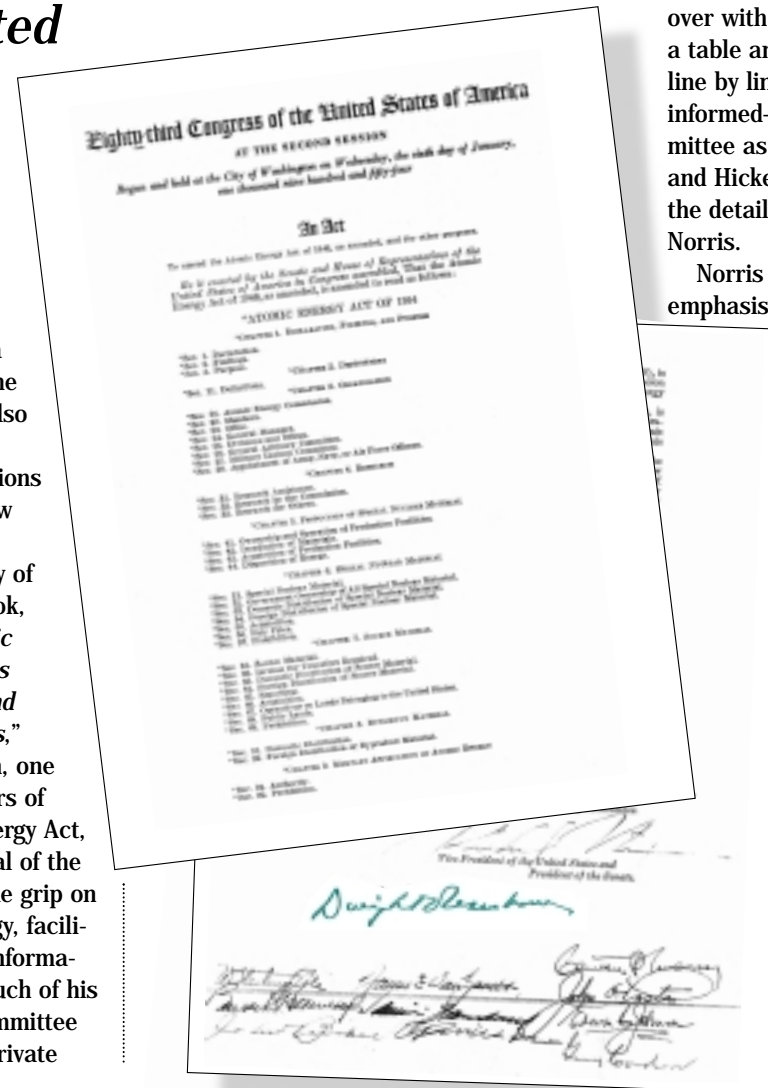
MAN BEHIND THE CURTAIN Although Cole and Sen. Bourke Hickenlooper (R-Iowa)—the vice-chairman of the Joint Committee—are considered the intellectual fathers of the Atomic Energy Act, Norris was the man “behind the curtain.”

On the act’s 45th anniversary, *Nuclear Energy Insight* spoke with Norris, who actually crafted the legislation.

Norris said his memorandum—originally prepared for

his employer, the president of Nuclear Development Associates—became a template for the new legislation. He kept a copy on his desk as he drafted the bill. He also kept a copy of the Federal Communications Act of 1934, and drew from it heavily.

“I also kept a copy of James Newman’s book, *The Control of Atomic Energy: A Study of Its Social, Economic, and Political Implications*,” Norris said. Newman, one of the original authors of the 1946 Atomic Energy Act, was extremely critical of the government’s vice-like grip on all nuclear technology, facilities, materials and information. Norris spent much of his time at the Joint Committee trying to introduce private



enterprise into atomic energy development.

“I drafted the act, which Cole and Hickenlooper went over with me. We sat around a table and went through it line by line. They were well-informed—as was the committee as a whole—but Cole and Hickenlooper knew all the details of the bill,” said Norris.

Norris was not alone in his emphasis on private enterprise. Both Cole and Hickenlooper were weary of a nuclear energy industry dependent on government appropriations. The Eisenhower administration also was adamant about reducing government spending. Combined with what one author termed Norris’ “near dogmatism on the matter of private enterprise,” the stage was set

for crafting legislation that valued economic competition. For Norris, that meant assuring that companies investing in atomic energy earned patent rights that could be a source of future revenue and leverage to attract future capital.

PATENT RIGHTS AT ISSUE The standard practice was to assign compulsory licensing rights to the government for a number of years if the patented invention was the product of a government-funded program. Otherwise, large firms already involved in atomic energy research would supposedly monopolize the market.

But Norris’ logic was also clear. Small firms would not be able to raise investment capital for research and development if investors had little prospect of reaping profits from new discoveries. The issue divided along party lines; Republicans in Congress tended to support Norris, while the Democrats tended to support compulsory licensing.

“Sterling Cole, in particular, accepted my position on requiring normal patent

rights throughout the industry, but the issue was controversial,” said Norris. In an effort to overcome resistance, Norris, Cole and Hickenlooper included an antitrust provision in the legislation aimed at preventing monopoly control of atomic energy.

When the Democrats took control of Congress in 1954, the antitrust provision remained, but the compulsory licensing of patents replaced the Norris patent effort. The legislation called for the patent issue to be revisited in five years, but a Democratic Congress never conducted the review.

INSURANCE INDEMNITY Norris also believed strongly that private companies willing to invest in nuclear energy needed an insurance indemnity to protect their investment in case of an accident. In 1957, under the guidance of committee Vice Chairman Sen. Clinton Anderson (D-N.M.) and Rep. Melvin Price (D-Ill.), Norris drafted the Price-Anderson Act. The act indemnified licensees and suppliers for insurance coverage of \$500

million over what was available on the private market.

After five years with the committee, Norris joined Cole in private law practice in New York. But before long, he was back in Washington as counsel to the Seapower Subcommittee of the House Armed Services Committee. The nuclear Navy was under way, and Norris could combine his two professional loves again.

Now retired in Florida, Norris is fond of sharing tales of his frequent interactions with Adm. Hyman Rickover, the legendary and celebrated father of the nuclear Navy. He laughs when he recounts receiving a telephone call one early Saturday morning. “What have you done for your country today?” came Rickover’s easily identifiable voice.

Despite an impressive record of achievement and service, one suspects that Norris was too modest to answer. ■

DOE’s Nuclear Programs Receive Strong Bipartisan Support in Congressional Funding Bill

The Energy Department’s nuclear energy research and development programs received a bipartisan thumbs-up from lawmakers last month, when Congress approved \$22.5 million for the Nuclear Energy Research Initiative and \$5 million for the Nuclear Energy Plant Optimization program.

The appropriations were part of a \$21.7 billion Energy and Water funding bill that includes nearly \$289 million for DOE’s nuclear energy programs.

More than 20 projects were selected earlier this month for funding under the Nuclear Energy Plant Optimization program, which seeks to develop key technologies, in cooperation with industry, that can help ensure the long-term via-

bility of America’s nuclear power plants.

Earlier this year, DOE honored the grant recipients for the first 45 projects under NERI. The program, launched last year with a \$19 million appropriation, funds research in support of advanced nuclear power plants and nuclear fuel.

HIGH-LEVEL WASTE PROGRAM Congress approved \$352.5 million for high-level radioactive waste management, a compromise between the \$355 million recommended by the Senate and the \$281 million voted by the House. DOE had said that funding at the House level would have seriously delayed a decision on the suitability of Yucca Mountain, the Nevada site of a proposed

nuclear waste repository. The approved funding will let DOE make a decision on site suitability in 2001. “We hope that the submission of a license application to the Nuclear Regulatory Commission will not be delayed,” said Marvin Fertel, NEI senior vice president, nuclear infrastructure support and international programs.

Of the \$352.5 million approved by Congress, \$240.5 million will come from the Nuclear Waste Fund—financed by consumers of nuclear-generated electricity—and \$112 million from the defense nuclear waste disposal account. Consumers are expected to contribute at least \$630 million to the waste fund in 1999.

OTHER DOE PROGRAMS

The funding bill also includes \$9 million for accelerator transmutation of waste. Congress funded this program—intended to produce a plan for developing such technology—at \$4 million last year when it was launched. The aim is to use the technology to reduce the volume and half-life of radioactive wastes by transforming them into less hazardous substances.

For its International Nuclear Safety and Cooperation Program, which supports improvements to the physical condition and operational safety of Soviet-designed nuclear power plants, DOE will receive \$15 million, less than half its request. The agency is to use the funding

“only for activities in support of completing the upgrades to [these] reactors,” said the conferees. “No funds are provided to initiate new programs in fiscal year 2000 or to expand new programs initiated in fiscal year 1999.”

THE NUCLEAR REGULATORY COMMISSION

Congress essentially held the line on the Nuclear Regulatory Commission’s budget, approving \$470 million, which includes \$5 million for the agency’s Inspector General. Last year, lawmakers appropriated \$471.4 million for the NRC, which included \$6 million for the Inspector General. ■

AmerGen To Buy Fourth Nuclear Plant

When AmerGen Energy came calling, Oyster Creek was ready. The nuclear plant in southeast New Jersey had been preparing for a buyer since the spring of 1997, when AmerGen was just a joint-venture twinkle in the eye of PECO Energy and British Energy.

Under the agreement reached last month between AmerGen and Oyster Creek operator GPU Inc., the single-unit 650-megawatt boiling water reactor will be purchased for \$10 million. GPU will buy all of Oyster Creek's electricity at a fixed price for three years and will provide AmerGen with a \$430 million decommissioning trust. The trust has been paid for by GPU electricity consumers.

Barry Abramson, PaineWebber managing director, sees the sale as a good fit for AmerGen, whose U.S. base is "next door" in Philadelphia. "It's the combination of financial resources, depth of organization and geographic proximity," he explains.

Merging Oyster Creek "into a very large nuclear organization with a lot of resources in the same general region" is also the way to make it economical, says Abramson.

GPU's decision to sell was driven in part by the plant's costs, Fred Hafner, GPU president and chief operating officer, said in 1997. Oyster Creek's electricity cost the company about 1.5 cents more per kilowatt-hour than the market price at that time, he said.

The sale is the final major step in GPU's strategy to exit the generating business, paving the way for the company to concentrate on its core business of transmission, distribution and related energy services. AmerGen agreed to buy another GPU nuclear plant—Three Mile Island Unit 1 in Pennsylvania—last year.

MILLSTONE UNITS FOR SALE

In a related development, Northeast Utilities has announced that it, too, is exiting the generation business. The company intends to sell its share of the Millstone plant owned by its subsidiaries, Connecticut Light and Power

and Western Massachusetts Electric Co.

The sale will include CL&P's 81 percent share of Millstone Unit 2 and its 53 percent share of Unit 3. Also included are Western Massachusetts' 19 percent and 12 percent interests, respectively. Unit 1 is being decommissioned.

The 36 percent share of the Seabrook nuclear plant in New Hampshire—

owned by Northeast Utilities' subsidiary North Atlantic Energy Corp.—will be put up for public auction separately.

Bruce Kenyon, president of Northeast Utilities' generation group, noted that to be a successful nuclear operator in a deregulated electricity market requires a significant fleet of plants to obtain economies of scale. ■

An Open Letter to a Concerned Senator: Nuclear Plants Set To Complete Y2K Work

The Honorable Robert Bennett
United States Senator
Chairman, Senate Special Committee on the Year 2000 Technology Problem

Dear Senator Bennett:

In reports on last month's Senate hearing on electric utility Year 2000 readiness, the media portrayed you as being concerned about outstanding Y2K issues at 20 of the nation's nuclear power plants. We thought some information on the status of the nuclear industry's readiness might help to ease any concerns you may have.

First, all Y2K safety-related work has been completed at all 103 nuclear plants—a fact confirmed by the Nuclear Regulatory Commission following audits at each plant.

As *Insight* went to press, 96 reactors had completed all remediation work and were Y2K ready. Of the seven reactors with work remaining (it was 20 when the hearing was held), three report they are only remediating site support systems that don't affect reactor operations. Five reactors are remediating plant operating or plant support systems. Only nine items remain open, and each has a firm completion date scheduled.

Details on the status of all open items, updated frequently, are available on the Nuclear Energy Institute's public Web site—
<http://www.nei.org/library/y2k_arch.html>.

Sincerely,

The Nuclear Energy Institute



'GREEN' AWARD FOR BULGARIA'S NUCLEAR POWER PLANT

The Bulgarian Green Party has chosen the country's Kozloduy nuclear power



plant as the first winner of its annual ecology award.

The award officially recognizes the safety upgrades carried out at the plant in recent years, as well as the plant's role in reducing overall carbon dioxide emissions as a non-emitting producer of electricity.

Kozloduy consists of six Soviet-designed units—four older 440-megawatt units and two newer 1000-MW units. Units 1-4 have undergone extensive upgrading with help from the European Union and members of the Group of 24 industrialized nations. Bulgaria has funded work by Western companies to improve the operational and safety reliability of units 5 and 6.

NUCLEAR PLANT LOWERS ROMANIAN FUEL BILLS

Thanks to Romania's Cernavoda nuclear power plant, the country is expected to save \$80 million on imported fossil fuels this winter.



The 700-megawatt Canadian-built reactor, which began operating in 1996, generated more than 10 percent of Romania's electricity last year. Cernavoda has saved the country the equivalent of \$100 million on imported fuel every year since it went on line.

NEW SLOVAK UNIT READIES FOR START-UP

The second unit at Slovakia's Mochovce nuclear plant should be on line by the end of the year. Work is ahead of schedule, according to utility officials.

Like its sister unit, which began operating last year, Unit 2 is a Soviet-designed 440-megawatt pressurized water reactor that has been extensively modified under a program financed by the European Commission. The modifications, based on safety analyses, include seismic upgrades, fire safety improvements, demonstration of the integrity of the plant's containment system, and a new emergency steam generator feedwater system.



TAIWAN PLANTS UNSHAKEN BY QUAKE

The 7.3 magnitude earthquake that struck Taiwan last month caused major damage—but did not affect the country's three nuclear power plants.

The plants, which supply about one-third of the country's electricity, are built to withstand quakes with a magnitude of more than 8, said a spokesman for plant operator Taipower. According to Taiwan's central weather bureau, the quake's magnitude was about 3 at the plant sites. The Kuoshen and Chinshan plants, located in the north, shut down to protect plant systems. The third plant, Maanshan—sited on the southern tip of the country—



reduced power but continued to operate.

Within four days of the quake, the plants were back on line.

MORE GERMAN YOUTH SAY 'JA' TO NUCLEAR

Members of Germany's Generation X don't spring to mind as obvious supporters of nuclear energy, but a growing number of young people in the country see nuclear power plants as an important source of electricity.

During the 1990s, the percentage of Germans in all age groups opposed to nuclear energy has fallen. But the decline among young people between the ages of 14 and 29 has been the greatest—from 29 percent opposed in 1990 to 17 percent this year.

The survey was conducted by the Allensbach Institute for Opinion Research for the Informationskreis Kernenergie, a Bonn-based information organization.

Asked about the German coalition government's plan to phase out nuclear energy, 64 percent of Germans of all ages said that nuclear energy would be needed for "many years." Forty-two percent of Germans also thought that nuclear energy will play a major role in meeting electricity demand over the next 20-30 years.

KEEP NUCLEAR IN U.K. ENERGY MIX
A cross-section of Britons—including members of Parlia-



ment, representatives of industry and the general public—believes nuclear energy should remain part of the nation's energy mix.

This view was among those received by the British government's Department of Trade and Industry in response to a consultation paper on new and renewable energy sources. The department issued an analysis of the more than 250 responses to its paper.

One main finding of the analysis is that renewable energy should be developed as part of "a balanced energy policy that gives appropriate consideration to energy efficiency, demand reduction and nuclear energy."

Several respondents said they believed that nuclear energy should remain part of Britain's energy mix because nuclear power plants emit no carbon dioxide. Some respondents expressed concern that two-thirds of the country's nuclear power plants will have reached the end of licensed operation by 2012. Renewables would be able to replace only a fraction of the electricity produced by these plants, they said. ■



For South Africa, Small Is Beautiful

Utility's Nuclear Plant Design Is Safe, Economical and Tiny

Problem: While many of South Africa's major metropolitan areas are inland, some large population centers lie on the coast—up to 1,000 miles from the coal on which the country's electricity generating plants rely.

Solution: Build several small, economical and safe nuclear power plants to supply electricity where it's needed—in coastal regions.

It's not quite that simple, of course. But when South Africa's utility, Eskom, decided to explore the future use of nuclear energy, it knew what it wanted: a nuclear power plant that would be competitive with its large coal-fired units, could be sited anywhere—and would be accepted by the public.

These criteria led Eskom to the small, modular pebble bed reactor—so named because the fuel consists of “pebbles” the size of baseballs, each containing more than 10,000 uranium oxide microspheres. While considered an advanced design, versions of this helium-cooled nuclear plant had been built and licensed in several coun-

tries, including Germany. That gave it a technical track record.

The economics looked good, too. Number crunching indicated that a diminutive 114-megawatt pebble bed plant could be built for less

added as needed, with one control room running as many as 10 units. That would put the capacity of the pebble bed plant near that of today's typical nuclear power plant, which averages 1,000 megawatts.



South Africa's new pebble bed nuclear plant could provide economical power for coastal cities like Cape Town.

than \$100 million, and could produce electricity at a cost of about U.S. 1.63 cents per kilowatt-hour. Eskom's current generating costs are about U.S. 1 cent/kWh, but the pebble bed reactor would be competitive with any new generating capacity built.

The design also offered flexibility. Modules could be

What really sold Eskom executives, though, was the design's resistance to an accident that could result in the release of radioactivity to the environment. That convinced the company of the reactor's inherent safety features.

Once it launched the project in 1993, Eskom worked swiftly—finalizing the concept design with the help of German, British, French, Dutch, Russian and Chinese companies, applying for a license, initiating an environmental impact assessment for use in selecting the first plant site, and lining up investors.

By the end of this year, the company expects to make a final decision on construction of the first plant, says David Nicholls, Eskom's program manager for the pebble bed modular reactor. “We're taking a 30 percent share in the project, and the Industrial

Development Corp.—a state-owned development finance institution—will take a 25 percent share,” says Nicholls. The remaining shareholders should be finalized by year end, he adds.

If the design is licensed by the Council for Nuclear Safety—South Africa's regulator—construction could begin in 2001, with start-up in late 2004 or early 2005, says Nicholls.


Within South Africa, Eskom estimates it can sell 10 units a year—based on an average growth in electricity demand of 3.5 percent over the 1980-1993 period. A single unit could provide electricity for about 30,000 South African consumers.

Although Eskom launched the project to meet its own generating needs, the reactor's economics have suggested a much broader market. Indeed, the design “may be particularly attractive to developing countries,” given such features as “its modular character, inherent safety and potential for low generating costs,” Mohamed ElBaradei said last month. But, added the director general of the International Atomic Energy Agency, the future of nuclear energy won't be guaranteed by safety alone. “Nor is ‘cheap’ nuclear power going to be enough.” These two attributes, plus public support, are needed if nuclear energy is to realize “its considerable potential.”

Public acceptance of nuclear energy is key for an industry “in which public opinion is quick to judge and slow to forget,” ElBaradei said. ■

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