

# DOE Breached Contract, Says Court

## Agency Can Be Sued for Failure To Begin Taking Used Nuclear Fuel

A U.S. appeals court has confirmed what the nation's nuclear utilities have known for more than two years—the Energy Department broke its contracts with utilities when it failed to start moving used fuel from nuclear plant sites by Jan. 31, 1998.

The deadline shouldn't have caught DOE off-guard. In two earlier rulings, another U.S. appeals court affirmed the agency's obligation to begin taking the used fuel. But DOE defaulted on its court-affirmed obligation.

As a result, some companies had to expand the storage capacity at their nuclear power plants to accommodate the used fuel that DOE should have taken. And some companies sued the agency for the cost of building such capacity.

Three companies filed individual suits in the U.S. Court of Federal Claims seeking monetary damages to cover costs resulting from DOE's breach of contract—Yankee Atomic Electric Co., Connecticut Yankee Atomic Power Co. and Maine Yankee Atomic Power Co. DOE argued that the cases should be dismissed because the companies had not first sought to resolve their claims through the contract's process for settling disputes. The federal claims court judge ruled against DOE.

In its Aug. 31 ruling, the U.S. Court of

Appeals for the Federal Circuit upheld that decision. It concluded that:

- DOE's failure to begin taking used nuclear fuel did not constitute a "delay" that could be resolved under the standard contract each utility had signed with DOE.
- Utilities properly filed breach of contract lawsuits in the federal claims court and were not obligated to seek resolution under the contract for damages caused by DOE's failure to perform.
- DOE breached its contractual obligation.

In a companion decision, the appeals court reversed and remanded another lower court decision in a case brought by Northern States Power Co. The company sought to recover damages for DOE's failure to meet its 1998 contractual deadline. "The Federal Circuit clearly reached the correct legal and factual result" in the two decisions, says Jay Silberg, a partner with Shaw Pittman, which represents Northern States Power.

"The Federal Circuit flatly rejected the government's claim that DOE's default under the spent fuel contracts was merely a routine 'delay,'" says Jerry Stouck of Spriggs & Hollingsworth, which represents the Yankee companies. "As

the court stated in the Maine Yankee opinion, 'the breach involved all the utilities that had signed the contract—the entire nuclear electric industry,'" he said. After more than five years of litigation over DOE's failure to perform, the agency "is now running out of legal defenses," says Stouck.

To date, the government's failure to take used fuel from power plants has triggered lawsuits by 12 companies seeking more than \$5 billion in damages.

"An alternative to prolonged litigation is readily at hand," Russell Mellor, Connecticut Yankee president and CEO, told the Senate Energy and Natural Resources Committee in September. DOE "can and should" use money from the Nuclear Waste Fund—established to pay for a repository through a small fee on all nuclear-generated electricity—"to site and operate a central, temporary storage facility," said Mellor. He added that regardless of where DOE provides for storage, "it has the clear authority and ability to begin removing spent fuel from reactor sites."

Contract



# Trade-Offs in Carbon Trading

## Debate Over Nuclear Energy at Climate Change Talks Is Sign of Its Value

When delegates from around the world gathered in Kyoto, Japan three years ago to hammer out an agreement on reducing carbon emissions, nuclear energy wasn't on the agenda.

How times have changed.

During the most recent climate change discussions in Lyon, France, nuclear energy was in the spotlight—as evidenced by the debate about which technologies qualify for carbon emission credits, and which do not.

The European Union (EU) wanted nuclear energy and large hydropower to be excluded from a “positive list” of technologies that would qualify for such credits. However, at the International Atomic Energy Agency's general conference last month, the European Commission—

the EU's executive arm—cited the value of nuclear energy in controlling greenhouse gas emissions in Europe. “If... the share of nuclear in total elec-

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*“The fact that nuclear energy is part of the political trade-offs is a sign of its incomparable emission-avoidance value, both today and in a potentially carbon-constrained world.”*  
.....

tricity production declines, the EU risks failing to stabilize its carbon dioxide emissions by 2010,” said a spokesman for the commission's direc-

torate general of energy and transport. “In fact, emissions could increase by 10 percent by 2010.”

At the Lyon meeting, the United States, Japan and Brazil were among a group of nations that argued there should be no limits on the nature and scope of eligible projects—or on a country's right to make its own energy decisions. “Countries don't want sustainable development choices dictated to them,” says Maureen Koetz, NEI's director of environmental programs.

### 'PRIORITY LIST' OF ELIGIBLE PROJECTS

In the end, the negotiators didn't decide whether to include or exclude nuclear energy. But to get things moving, the EU offered a new “priority list” of projects eligible for carbon emission credits. While the list doesn't include such technologies as nuclear energy and hydro, that doesn't mean they are excluded, according to an EU official at the Lyon meeting.

Carbon trading makes possible a fair rate of return on investments in pollution control, Koetz told those attending an industry-sponsored panel presentation at the 13th session of the subsidiary bodies to the climate convention. For example, carbon emission credits could allow an investor to recover about \$445 for each kilowatt of nuclear capacity built. Koetz was speaking on behalf of the International Nuclear Forum, an informal group of the world's leading nuclear industry associations.

Some major oil-exporting countries want to be compensated for the market share they could lose if carbon is controlled in the future. And they don't want nuclear energy to be eligible for carbon trading credits because it could affect their market. “The fact that nuclear energy is part of the political trade-offs is a sign of its incomparable emission-avoidance value, both today and in a potentially carbon-constrained world,” said Koetz.

# License Renewal Made Easier by Sharing Information

The nuclear energy industry's long-time practice of sharing plant operating information has paid off in many ways. One of the most recent benefits: a shortened timeframe for preparing a nuclear plant's license renewal application.

Carolina Power & Light told the Nuclear Regulatory Commission last month that it was advancing by one year its schedule for filing an application to renew the license of its H.B. Robinson plant near Hartsville, S.C.

The reason? “Efficiencies identified from other utilities completing the process,” said the company. Constellation Energy received approval from the NRC in March to run its Calvert Cliffs plant for an additional 20 years, and Duke Energy won approval for its Oconee plant two months later. Both companies have shared with other compa-

nies their experience in preparing their applications.

Originally, CP&L planned to seek a license extension for the plant in 2003. Now, the company intends to submit its application in the fourth quarter of 2002. CP&L also will file for license renewal for its two-unit Brunswick plant near Southport, N.C., in 2004. Although the license for the company's third plant—Harris—doesn't expire until 2026, CP&L expects to file for Harris in the future.

“CP&L's nuclear plants provide our most efficient form of electricity generation, and their increased emission-free output has played a decisive role in keeping electricity prices stable,” said C.S. “Scotty” Hinnant, the company's chief nuclear officer.

# Today's Research Will Save Lives Tomorrow

## Young Chemists Use Radioisotopes To Diagnose, Treat Cancer

**J**ean Madden had only a vague idea of the work done at the University of Missouri's Research Reactor Center. That changed when he had a chance to tour the Columbia, Mo., facility earlier this year.

Madden discovered that researchers at the center developed radiopharmaceuticals—drugs containing a radioisotope that is bound to a molecule capable of homing in on specific tissues in the body—for use in combating cancer. “The example that struck me is something now called Quadramet,” he said. The product, developed by the center in collaboration with Dow Chemical, provides relief from the pain of bone cancer.

In a twist of fate, just weeks after his visit to the center, Madden had a bone scan following the onset of extreme pain. The scan confirmed that an earlier cancer had spread. A cancer specialist suggested options for treatment. “When he got to his favorite, Quadramet, I began to grin,” said Madden. “I said: ‘You don’t have to go any further.’”

Madden's pain is under control, and he's undergoing therapy to deal with the cancer.

Cathy Cutler knows all about Quadramet. She's a research scientist at the Missouri Research Reactor Center. Cutler and her fellow researchers take isotopes produced in the center's reactor from the research stage to commercial application. “We're driven by what works,” she says. Cutler, who has a PhD in inorganic chemistry, was attracted to the field because she “would be making things that would be used.” She also liked the wide-ranging aspects of the work. “You need to know chemistry and biology, you need to understand radiation and physics,” she says. And she works with all kinds of specialists, from doctors to engineers.

Roger Schibli finds similar challenges and rewards at the Paul Scherrer Institute in Switzerland. A PhD chemist in the Center for Radiological Science, Schibli engages in basic research aimed at finding new ways of using radioactive drugs to diagnose and treat specific



Researchers like Roger Schibli seek new ways to use radiopharmaceuticals in diagnosing, treating cancer.

kinds of cancer. “The challenge for me is the interdisciplinary nature of the research,” he says. “You combine techniques and tools that, at first sight, appear to come from totally different research

areas, such as inorganic/organometallic chemistry, radiochemistry, biochemistry and medicine. But they have a common objective: to find new drugs and enhance the effectiveness of existing drugs for cancer diagnosis and therapy.”

The ultimate reward of his work, says Schibli, is the benefit it could bring to patients—early detection of cancer, infection or inflammation of organs and tissues, and treatment of cancer with little or no side effects.

“I hope radiopharmacy becomes an established tool—together with other procedures such as chemotherapy and gene therapy—in the battle against cancer and other diseases,” says Schibli.

## Future of University Reactors Uncertain

**A**s universities cope with competing demands for resources, many are finding it hard to maintain their reactor programs.

Over the next five years, about half of university reactors will face a decision on license renewal. If engineering deans are forced to make that decision purely on the basis of available resources, many nuclear engineering programs will suffer, according to a report by a “blue ribbon” panel of the Energy Department's Nuclear Energy Research Advisory Committee.

That's why the panel recommended that DOE continue its base program of university reactor support. The panel also suggested that DOE institute a peer-reviewed research and training award program to provide reactor improvements and enhance training opportunities.

The possible loss of reactor facilities—which can be used for research and isotope production

as well as nuclear engineering program support—is of great concern to university engineering deans, many of whom met last month to discuss the panel's report.

During the meeting, some deans called on DOE to help fund the reactor relicensing costs, which can be considerable. Relicensing the University of Michigan's reactor, for example, would cost about \$1 million.

“If something isn't done soon to support university reactor programs, there might not be any reactors left on college campuses in the next decade,” said one dean.

That would affect the quality and quantity of nuclear science, technology and engineering students, said Marvin Fertel, NEI senior vice president. “The nuclear industry's future depends on a continuing supply of people trained at our nation's universities,” he said.

# Building Confidence in Yucca Mountain

## DOE Strengthens Scientific Basis of Repository While Managing Uncertainties

Preliminary analyses unveiled by the Energy Department at recent public meetings indicate that the proposed used nuclear fuel repository in Nevada will protect public health and safety. According to these analyses, radiation levels associated with the repository at Yucca Mountain 10,000 years into the future will be a tiny fraction of naturally occurring background radiation, and well below regulatory limits.

As the time approaches for the repository site recommendation decision by the president—scheduled for mid-2001—DOE’s projections of repository performance will be closely scrutinized.

Last month, the Nuclear Waste Technical Review Board—an independent oversight body—hailed the “significant progress” in DOE’s scientific program since 1998, when the agency last published an assessment of repository performance. But the board—which must advise the president and Congress on DOE’s scientific results—also pointed to “many areas where improvement is needed.” While calling on DOE to intensify efforts to address uncertainties in projecting repository performance thousands of years into the future, the board acknowledged that “eliminating all the uncertainties will never be possible.” It noted that a decision on whether to recommend the site “can be made at any time, depending in part on how much uncertainty policymakers are prepared to accept.”

Regulators agree. Proof of repository performance “is not to be had in the ordinary sense of the word,” says the Nuclear Regulatory Commission. The Environmental Protection Agency, which is developing repository radiation standards, says that proof “is neither necessary nor likely to be obtainable.”

Uncertainties can, however, be managed, says Abe van Luik, senior policy advisor for performance assessment at DOE’s Yucca Mountain office.

For the past two years, DOE has been doing just that: evaluating uncertainties in the future performance of a deep geologic repository. “We determine

which [uncertainties] are more important,” says van Luik. “Then, we work either to reduce them or mitigate them.”

To help reduce uncertainties, DOE has improved the models used to analyze repository properties and processes. Among them: models on climate change, the effects of heat on the mountain, and the movement of water and radioactivity through the mountain.

None of these modeling advances would have been possible without substantial scientific pro-

gress, says van Luik. Various tests have provided scientists and engineers with a better understanding of how water moves through the different rock types that make up Yucca Mountain, how corrosion processes affect possible materials for used fuel containers, and how heat affects water in the rock and the rock itself.

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The Nuclear Waste Technical Review Board won’t stop looking over DOE’s shoulder, and it won’t stop asking questions. That’s its role. And DOE will con-

### Signs of the Times

Pack rats—large, busy-tailed rodents—have been around for thousands of years. During the last ice age, some 50,000 years ago, they thrived in what is now the Yucca Mountain area in Nevada. How do scientists know this? Because the pack rats left behind their middens—masses of plant material and fecal pellets cemented by urine and preserved in small rock shelters.

The information the middens provide on climate in the distant past can be used to help project climate in the distant future. Their survival in the Nevada desert for such a long time—without the protection afforded to used nuclear fuel by 1,000 feet of solid, dry rock mountain and corrosion-resistant containers—bodes well for a repository’s future performance. “Nature does indeed preserve things better than we’d expect—especially in



PHOTO COURTESY OF MEDIA AFFAIRS/YUCCA MOUNTAIN PROJECT

places like Yucca Mountain,” says Tom Doering of the EPRI research institute.

Scientists studying the Yucca Mountain site to determine its suitability for a used fuel repository are using information from this natural analogue to supplement their climate projections. It’s just one of many analogues—natural and human—that offer insights into the processes that will affect the future behavior of a repository.

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The uncertainties that can’t be quantified are treated conservatively, overestimating the conse-

quences, says van Luik. Indeed, DOE’s results “can be considered overly conservative,” says Tom Doering of the EPRI research institute in Palo Alto, Calif. Doering has been collaborating with independent scientists in examining DOE’s latest analyses. “It’s possible that the greatest uncertainty may lie in how much better the repository will perform than is currently predicted,” he says.

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tinue to reduce uncertainties—by applying conservative safety margins, providing a defense-in-depth repository design, establishing a robust repository performance confirmation program, and incorporating in its performance projection the historical insights from natural analogues that have survived for thousands of years.

In that way, “confidence in the safety of the repository should increase over time,” says van Luik.

# New Nuclear Plants on the Horizon?

## Growing Global Support for Research and Development Programs

**F**rom Paris to Johannesburg, from London to Washington, D.C., there's growing talk about building new nuclear power plants.

Gerald Clark thinks it's happening for two reasons. "Not just competition, but global climate change are driving perception and debate on the next generation of reactors," says the outgoing secretary general of The Uranium Institute, based in London.

"Innovation has taken root," says Clark in describing the current global mood about nuclear energy. "These are very exciting times to be in the nuclear industry."

In the view of Energy Secretary Bill Richardson, "Nuclear energy needs to be part of the global, clean energy mix. In the United States, we are revitalizing research and development, to assure the cost competitiveness and viability of nuclear energy through the next century."

### SOUTH AFRICA'S MODULAR DESIGN

The small, modular pebble bed plant design being developed by Eskom, the South African utility, has generated considerable global interest. British Nuclear Fuels took a

20-percent stake in the project earlier this year, and recently, Philadelphia, Pa.-based PECO Energy Co. said it was making a 10-percent investment.

"We view this as research and development investment in a promising future generating technology," said Corbin McNeill, PECO Energy's chairman and CEO.

Designed to produce about 100 megawatts of electricity, the pebble bed's modular design and small size help reduce construction costs and add flexibility by allowing additional reactors to be added as needed. The helium-cooled reactor's safety systems rely on natural forces and require no human intervention to function.

### STRATEGY FOR U.S. INDUSTRY

A new U.S. nuclear energy industry task force is thinking strategically about development of new nuclear power plants in the United States and internationally. The group seeks to capitalize on changing perceptions of nuclear energy as an emission-free source of electricity and to develop a strategic business plan that supports the introduction of new, advanced designs into competitive electricity markets.

## Funding for Advanced Plants

**C**ongress, for one, is looking ahead to the next generation of nuclear power plants. It has approved \$7.5 million for a new Energy Department program that will explore various nuclear technology options. Of this amount, \$4.5 million is earmarked for the development of a so-called Generation IV nuclear plant.

The Generation IV plants will be part of the continuum of advanced nuclear plant designs. Generation II plants are today's workhorses, which continue to set new production and safety records. They owe some of their efficiency improvements to the Generation III plant designs now approved by the Nuclear Regulatory Commission for construction. Included in DOE's new nuclear technology program is \$1 million to analyze and describe changes, such as improved cost competitiveness, for the Generation III designs.

Congress also approved \$1 million to plan and implement initiatives supporting an advanced helium gas nuclear plant, as well as \$1 million to study the feasibility of building and operating small modular nuclear plants.

### U.S.-FRENCH RESEARCH AGREEMENT

Sharing information and ideas is key to the success of any technology. In an effort to foster the study of advanced nuclear reactor engineering, the United States and France signed a nuclear technology R&D agreement last month.

The five-year agreement establishes a steering committee under which expert groups will direct

research in areas of mutual interest, including reactor engineering and scientific study in the nuclear field and research on advanced reactor fuel and reactor materials. The two countries also will cooperate on the medical and industrial application of isotopes.

# Congress Funds New Nuclear Energy Program

## Appropriations Bill Expands Support for Nuclear R&D, Used Fuel Management

It started with the Senate Appropriations Committee, which envisioned the expansion of nuclear energy around the world. Key to such expansion, it believes, is development of the next generation of nuclear power plants. That's why the panel last month recommended—and Congress endorsed—\$7.5 million to fund a new Energy Department program, Nuclear Energy Technologies, beginning this month. Of this amount:

- \$4.5 million is for developing a road map for the commercial use of a “next generation” power reactor
- \$1 million is for preparing a detailed assessment analyzing the changes needed for new advanced light water reactor designs to be built in a competitive electricity market
- \$1 million is for planning and implementing initiatives in support of an advanced gas reactor, and
- \$1 million is to determine the feasibility of using small modular reactors.

The Energy and Water Development Appropriations Act also provides \$35 million for the Nuclear

Energy Research Initiative, which funds research on advanced technologies aimed at improving the cost, safety and waste management of nuclear energy systems. The Nuclear Energy Plant Optimization program—a cost-shared effort with the nuclear industry focusing on issues that could affect the continued operation of nuclear plants, such as material fatigue and fuel performance—will receive \$5 million.

DOE will receive \$401 million for its high-level radioactive waste management program, including the proposed used nuclear fuel repository at Yucca Mountain, Nev. DOE's Yucca Mountain site recommendation report is due to be issued next year.

The bill also provides \$249.4 million for fissile materials control and disposition, of which \$26 million is earmarked for the construction of a mixed oxide fuel fabrication facility at DOE's Savannah River Site in South Carolina. DOE will receive \$20 million for its International Nuclear Safety and Cooperation Program, which supports improvements to the physical condition and operational safety of Soviet-designed nuclear power plants.

The Nuclear Regulator Commission will receive \$481.9 million. In addition, the appropriations bill incorporates the NRC Fairness in Funding Act—which reduces annual fees collected by the NRC from nuclear operating companies through fiscal 2005. It would reduce assessments by 2 percent in fiscal 2001 (approximately \$9 million in savings), with additional 2 percent decreases through 2005, for an overall reduction of 10 percent.

President Clinton vetoed the appropriations bill on Oct. 7, in large part due to a provision regarding the flow of water in Missouri River.

The House and Senate are negotiating compromise language.

## Clean Air Benefits Matter, Voters Say

What's in a sentence? A lot, according to a key segment of the public.

A recent survey of public opinion has found that mentioning just a few words about nuclear energy's environmental benefits significantly increases public support for nuclear energy.

The survey found that information that nuclear power plants do not emit any greenhouse gases or other air pollutants increased those in favor of nuclear energy from 61 percent to 75 percent. The environmental benefits message also cut those strongly opposed to nuclear energy nearly in half,

from 12 percent to 7 percent.

The survey solicited opinions from college graduates who are registered to vote. The opinions of this influential portion of the public are important because they help gauge support for nuclear energy among policymakers and decision-makers.

The new data suggest an increase in the importance of environmental information in determining attitudes about nuclear energy. The recent survey, which monitors attitudes by asking identical questions over time, shows a 4 percent increase from last April when environmental benefits information

increased those in favor of nuclear energy by 10 percent.

In addition, an overwhelming majority of respondents—73 percent—said that nuclear energy plants should receive the same tangible benefits for avoiding emissions that fossil fuel plants receive for reducing emissions.

On the used nuclear fuel issue, respondents agreed by a margin of three-to-one that the president should approve construction of the proposed used fuel repository at Yucca Mountain if government studies confirm the suitability of the site.



# License Extension of French Plants Makes Sense

## Study Cites Economic, Environmental Benefits of Renewal

Extending the operation of nuclear plants represents sound economic and environmental thinking, according to a major independent study of nuclear energy in France.

The report—conducted at the request of Prime Minister Lionel Jospin—is a collaborative effort of France’s national scientific center and atomic energy commission, and a major public policy group. The study examines the near-term economic and environmental implications of extending the operation of existing nuclear plants and the long-term prospect of new nuclear plant construction.

The report concludes that extending electricity production at nuclear plants improves the economics of the entire electric system. As existing plants in France are relatively young, a modest 10 percent extension of service results in a 6 percent saving on the average cost of a kilowatt-hour of electricity.

Moreover, the study notes that closing nuclear plants after only 30 years of operation would result in a 65 percent increase in the production of carbon dioxide, considered a leading greenhouse gas.

“The French report is a welcome reminder of the economic benefits... of nuclear energy,” said Wolf Schmidt-Küster, secretary general of the European Atomic Forum. “There are growing concerns about carbon dioxide emissions and climate change, and European Union leaders are focusing their attention on these problems and the increased energy independence that nuclear offers,” he said.

A copy of the 300-page report—in French—is available at <http://www.plan.gouv.fr/organisation/seeat/accueilnucleaire.html>.

An English translation of the report’s executive summary is available on the European Atomic Forum Web site at [http://www.foratom.org/Foratom/Press\\_Room/Press\\_releases/Charpin\\_Report/Charpin.htm](http://www.foratom.org/Foratom/Press_Room/Press_releases/Charpin_Report/Charpin.htm)

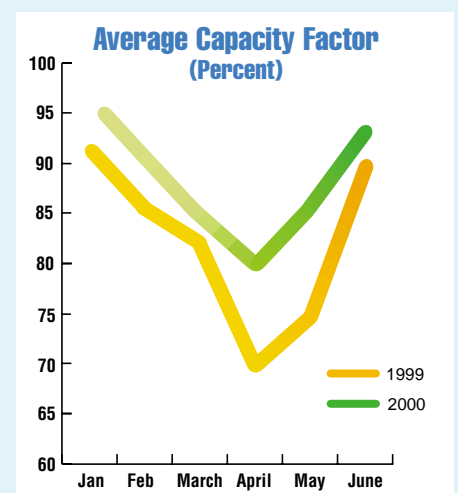
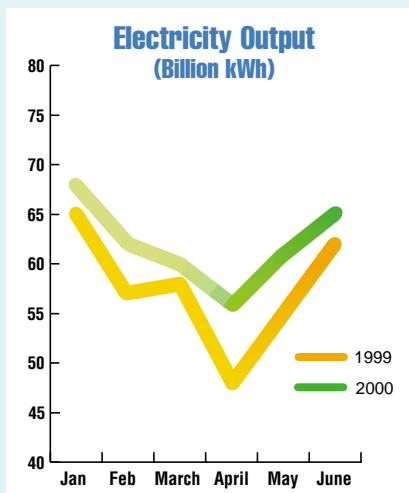


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**Extending the operation of France’s nuclear plants would reduce both electricity costs and carbon dioxide emissions.**

## Efficiency: On the Up and Up

U.S. nuclear plant performance in 1999 broke all records. But in the first half of this year, the nation’s nuclear plants operated even more efficiently than during the same period last year—as measured by electricity output and capacity factor (the amount of electricity produced as a percentage of maximum output achievable).\*

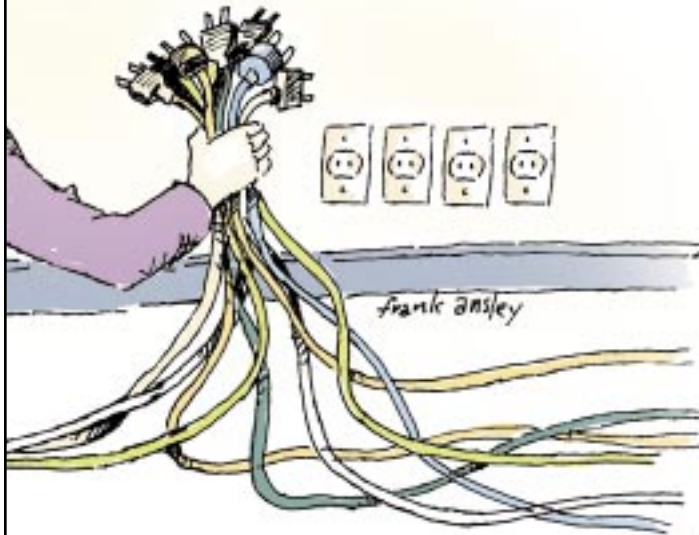


\*Dips in output/capacity levels are due to scheduled maintenance and refueling outages during periods of low seasonal electricity demand in the Spring.

Source: U.S. Energy Information Administration

# Plugging Into Nuclear Energy

## Students Get Connected



College students are on a power trip. Look around the average student's dorm room and you're likely to see all—or most—of the following: computer, radio/CD player, refrigerator, electric fan, lamp, hair dryer and iron.

All this equipment has something in common, of course—it needs electricity to operate.

At the University of Illinois, for example, student electricity use is steadily rising, from 25.6 million kilowatt-hours in 1998 to 26.2 million kWh this year.

Last year, the state of Illinois generated 160.4 billion kWh of power, just over half of it from nuclear energy. The state has 11 nuclear generating units, which produced 81.7 billion kilowatt-hours of electricity in 1999.

# NUCLEAR ENERGY insight

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