

# insight

APRIL 2000

## Calvert Cliffs Good To Go for 20 More Years NRC Issues First-Ever License Renewal to Maryland Nuclear Power Plant

At 2:15 p.m. on March 23, Richard Meserve made history.

That's when the Nuclear Regulatory Commission chairman telephoned Christian Poindexter to say the Calvert Cliffs Nuclear Power Plant could operate for an additional 20 years. Meserve told the Constellation Energy Group's chairman, president and CEO that the NRC had approved the company's request to extend the plant's original 40-year license.

Just 23½ months earlier, Constellation Energy had submitted a license renewal application to the agency—the first in the country to do so. While the NRC's review of the application took just under two years, Poindexter said the company's 2,500-page submittal represented a decade of work. He credited "the thousands of Constellation employees who, through the years, have shown a commitment to safety, integrity and quality."

A key element of the NRC's review was an examination of the environmental impacts of license renewal, as well as alternatives to renewal—a coal-fired or natural gas-fired power plant. Renewing Calvert Cliffs' license

would have only "small" significance on everything from ecology to human health to air quality, said the agency's staff. However, replacing the nuclear plant with a coal or gas plant could cause "moderate to large" environmental impacts.

Take air quality.

- A coal-fired plant would produce sulfur dioxide, nitrogen oxides, particulates, carbon monoxide, fly ash and scrubber sludge.
- A natural gas-fired plant would produce nitrogen oxides.
- Calvert Cliffs produces no emissions.

Renewing the plant's license is the right thing to do, environmentally. It also makes sense economically. "We got 1,700 megawatts of installed capacity for \$11 a kilowatt," Poindexter said during a March 24 press

briefing. That's impossible to beat. To build a new 400-megawatt advanced gas combined-cycle plant would cost about \$580/kW, according to the Energy Department's Energy Information Administration. A new 400-megawatt coal-fired plant would cost about \$1,100/kW. What's more, electricity from a well-run nuclear plant costs about 2.0-2.5 cents per kilowatt-hour. A new combined cycle gas plant produces electricity at about 3.0-3.5 cents/kWh, and a new coal-fired plant, at about 4.0-4.5 cents/kWh.

The key to extended plant operation is understanding and managing plant aging, Charles Cruse, vice president of Constellation Energy's Nuclear Group, said during the press briefing. "At Calvert Cliffs, we found that 96 percent of the required aging management programs already existed," he said. Of that 96 percent, three-quarters needed no modification, and one-quarter needed some enhancement.

Cruse called the plant's license renewal a "win-win-win" situation. "Consumers win. The environment wins. And the company's interest and the national interest are both

*Continued on page 2*



BALTIMORE HARBOR — PHOTO COURTESY OF PAUL C. SNYDER, SR., CONSTELLATION ENERGY GROUP



Calvert Cliffs from page 1

well-served. "License renewal represents a vote of confidence in nuclear energy," Cruse said.

#### LESSONS LEARNED

As the license renewal trailblazer, Constellation Energy has acquired considerable knowledge and experience. This is how the company's Charles Cruse summarized the lessons learned:

- There are no aging effects unique to license renewal.
- Current inspection activity on site, with some additions, will ensure that aging is managed cost effectively.
- Effective communications with all stakeholders is essential, as is strong local support.
- The cost of license renewal—and the time required for the process—probably can be significantly reduced.

In response to a question during the March 24 press briefing, Constellation Energy's Poindexter said the cost of pursuing license renewal could probably be cut in half—from the \$20 million the company spent to about \$10 million for future applicants. For Calvert Cliffs, the entire process—starting with the application's development—took 10 years. Future efforts are likely to take five.

### "Many, Many More To Come"

Calvert Cliffs is the first nuclear plant in the country to renew its license. But not the last. There are "many, many more to come," said Joe Colvin, NEI president and CEO, during a March 24 press briefing.

The NRC is reviewing applications for six nuclear units from three companies—Duke Energy, Entergy and Southern Nuclear. The operators of another 22 nuclear units have notified the agency of their intention to file applications. Ultimately, more than three-quarters of today's operating plants are likely to renew their licenses.

For details on the companies that have applied to the NRC—or said they intend to—see <http://www.nrc.gov/NRC/REACTOR/LR/index.html>.

# U.S. Nuclear Energy Technology Showcased in China

In a bid to convince the Chinese nuclear industry to "Buy American," representatives of three U.S. nuclear power plant manufacturers traveled to Beijing last month.

The companies—ABB Inc., GE Nuclear Energy and Westinghouse—plus Bechtel and the Nuclear Energy Institute anchored the U.S. pavilion at the China International Nuclear Industry Exhibition 2000. Although U.S. nuclear technology has been adopted by nations around the world, this was the first time it was put on show collectively in China.

China now generates slightly more than 1 percent of its electricity from nuclear energy, but it hopes to expand production to 3 percent by 2006. To promote nuclear commerce, several Chinese organizations sponsored

the exhibition, which featured more than 150 exhibits from 15 countries.

"Nuclear energy helps protect the environment and helps us toward our goals of sustainable development," said Li Dingfan, general manager of the China National Nuclear Corp., at the exhibit's opening ceremony.

Working with U.S. industry officials, the U.S. Department of Commerce hosted a roundtable discussion with Chinese government and industry representatives. "Other countries have achieved self-sufficiency in nuclear energy through technology transfers and partnerships with U.S. suppliers," said Joe Colvin, NEI president and CEO, at the roundtable. "There is an opportunity for similarly effective partnership between Chinese and U.S. nuclear industry."



*Postcard from Beijing—Exhibition going well. Much interest in U.S. nuclear technology.*

# Industry Urges President To 'Show Leadership,' Sign Nuclear Waste Disposal Act

The nuclear energy industry began early this month to encourage President Clinton to move forward with nuclear waste disposal legislation.

The Nuclear Waste Policy Amendments Act of 2000 was presented to the president on April 14. If Clinton stands behind his threatened veto, the bill would face an override vote as soon as the Senate returns in late April or May.

With the passage of the bill by both houses of Congress, nuclear waste reform now has progressed further than it has in the six years that Congress has considered some type of legislative solution to improve the federal high-level waste disposal program. Following a decisive 64-34 vote in the Senate on Feb. 10, the Nuclear Waste Policy Amendments Act of 2000 secured a second crucial bipartisan vote in the House on March 22 of 253-167.

The bill strips away concerns of the adminis-



- tration that surfaced in past nuclear waste reform initiatives. For these reasons, Nuclear Energy Institute President and CEO Joe Colvin encouraged President Clinton to show "leadership on a vital environmental issue by signing S. 1287."

In an April 4 letter to the president, Colvin noted that the bill includes a role for the Environmental Protection Agency to establish radiation protection standards for the public and the environment near a proposed repository at Yucca Mountain in Nevada. "Allowing EPA an opportunity to consult with the Nuclear Regulatory Commission and the National Academy of Sciences in the development of a radiation protection standard strengthens the legislation," Colvin wrote.

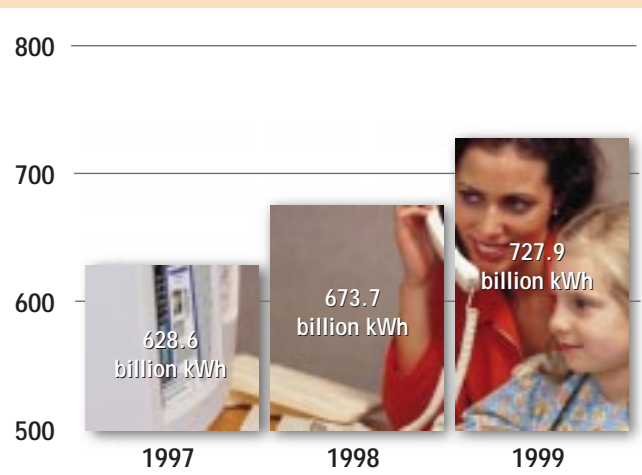
S. 1287 also ensures safe, workable improvements to the transportation program for transfer of used fuel from nuclear plant site to repository.

- Colvin reminded the administration of its legal obligation to dispose of used nuclear fuel and the by-products of defense-related activities. Three subsequent federal court rulings have upheld the federal government's legal and statutory duty to move nuclear waste, Colvin wrote.

## Power to the People!

The nation's 103 nuclear power plants produced a record 728 billion kilowatt-hours of electricity in 1999. That's enough power to meet the needs of 67.5 million U.S. households. Or, looking abroad, it's enough electricity to supply both France and the United Kingdom for a year. And it could meet double the annual power use in Africa or the Middle East—with electricity to spare.

U.S. nuclear output has soared since 1997, when it was 628 billion kWh—enough to supply 58 million households or meet electricity demand for the entire South American continent.



# Nuclear's Future, NRC Effectiveness Are Linked

## Senate Urges Continued Improvement in Regulatory Efficiency

"People are beginning to look at nuclear energy again as a viable option for our energy needs in the future."

That's the observation of Sen. James Inhofe (R-Okla.), chairman of the Subcommittee on Clean Air, Wetlands, Private Property and Nuclear Safety.

*The NRC's programs "have benefited" from congressional scrutiny, Meserve told a Senate subcommittee.*



Richard Meserve,  
Chairman of the Nuclear  
Regulatory Commission

The improved outlook for nuclear energy—which produces nearly 20 percent of America's electricity—stems in part from dramatic gains in regulatory efficiency.

In July 1998, Inhofe initiated a series of oversight hearings on the effectiveness and efficiency of the Nuclear Regulatory Commission. That hearing—and the one that followed in early 1999—galvanized the NRC's regulatory reform efforts.

At a March 9 hearing, Inhofe emphasized the importance of the agency's role.

"The NRC remains the foremost government agency on issues involving nuclear safety and the impact on public health and the environment," he said. "As far as this subcommittee is concerned, you are... the recognized experts on these issues."

Panelists at the hearing included Sen. Jeff Sessions (R-Ala.), a former member of the subcommittee who requested the opportunity to testify. Citing a number of sources on the safety and environmental benefits of nuclear energy, he emphasized the importance of this technology.

Sessions called nuclear energy "one of the

cleanest sources" of electricity in the nation. "I think it's insane for us to think we can meet our energy needs without nuclear," he said.

"I am hopeful the NRC will continue these needed reforms," said Sessions. "The future of our nation's energy supply depends on it."

NRC Chairman Richard Meserve highlighted a wide range of agency accomplishments. These included the new oversight process for nuclear power plants, timely license renewal reviews and prompt, effective handling of license transfers. He also noted that the NRC's programs "have benefited" from scrutiny by Congress and other stakeholders.

NEI's Ralph Beedle seconded that opinion and urged the subcommittee to continue its support and oversight of the agency. Beedle is senior vice president and chief nuclear officer.

"Congressional oversight can help keep the agency focused on the essential public policy concern—maintaining a high level of public safety," he said.

## New York Plant Sale Sets Record

At \$976 million, Entergy Nuclear's winning bid for two nuclear power plants in New York state is a record. The New Orleans-based company had originally offered \$806 million for the Indian Point 3 and James A. FitzPatrick plants, but raised its price in response to a competing proposal from Dominion Resources Inc.

The payment of \$536 per kilowatt is almost four times greater than the previous high for the sale of a nuclear plant and is comparable to those for recent sales of fossil-fueled power

plants, according to the New York Power Authority. The authority approved Entergy's bid at the end of March.

The price includes \$636 million for the plants themselves, nearly \$171 million for fuel that is on hand or ordered, \$92 million for a guaranteed portion of decommissioning expenses, and \$68 million reflecting the power authority's commitment to additional power purchases from FitzPatrick.

Entergy agreed to employ all staff members, both at the nuclear plants and in direct support

functions—about 1,700 in all—with salaries and benefits equivalent to those they receive at the power authority.

"Our thorough and carefully planned negotiating process has worked to bring the people of New York state outstanding value for these significant public assets," said C.D. "Rapp" Rappleyea, NYPA chairman and CEO.



# NRC's Compass for Change Is Well-Defined

In the 12 years that the Nuclear Regulatory Commission has been holding an annual conference, few can remember a chairman's keynote address that was interrupted by spontaneous applause. Until now.

"I am particularly pleased to inform you that we issued a renewed license to Calvert Cliffs last Thursday," said Chairman Richard Meserve at the March 27 opening session. After a thorough safety review—and some 30 public meetings, "the staff completed its work well within the 30-month schedule."

At that, the 1,000-plus participants showed their appreciation for the agency's accomplishment with an unexpected round of applause.

Meserve went on to discuss a wide range of initiatives that are under way at the NRC and the compelling reasons for regulatory reform. "We are headed in the right direction," he said. While the path ahead "will be long and difficult," he expressed confidence that "the compass for our journey is well-defined."

The NRC's new oversight process for nuclear power plants ranked number one on the list of conference topics. On March 28, the commission approved implementation of the process starting this month.

While the NRC has made great strides in efficiency and openness, it remains subject to potshots from its more strident—and sometimes colorful—critics.

"Our integrity is constantly being questioned," said Commissioner Edward McGaffigan in his March 28 conference address. "We make choices based on the facts presented to us." He recalled, for example, how critics of nuclear energy called for all nuclear power plants to be shut down before the Y2K rollover. The critics' safety argument, he said, "was never technically credible. ... The NRC didn't bow to ill-informed, opportunistic criticism."

Commissioners Nils Diaz and Jeffrey Merrifield touched on similar themes in their remarks.

"The commission is dedicated to democratic processes and diversity of views. We will make decisions, pleasing and not pleasing," Diaz said. "We need to make choices with the best available information—and that we will do."

Merrifield advocated a stronger role for the NRC in enhancing public confidence in the agency. "If we can't persuade the public that we are credible, how are they to know?" He said the NRC no longer should allow untrue assertions to go unchallenged. "I believe that if we have a defensible argument, it is irresponsible not to speak out," Merrifield said.

## A Regulator's View of Competition

Competition has had a positive impact on nuclear safety, a Nuclear Regulatory Commission official said last month.

"The need to compete has led to better management of nuclear power plants," Hubert Miller said at the NRC's annual conference in March. Miller is the administrator of the agency's Region I—an area embracing 11 Northeastern states with a total of 16 nuclear plants. He was asked for his view of competition by a conference participant.

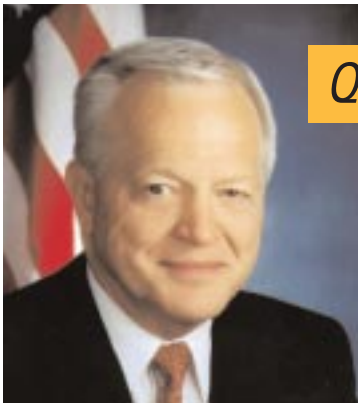
Better plant management has led to improved work planning and control, said Miller. Better engineering support and a stronger operational focus at plants have helped to reduce maintenance backlogs. "And when backlogs are reduced, safety margins are increased," he said.

Miller added that the NRC's "penetrating, probing" inspections will be essential to ensure continued safety under the agency's new oversight process, which began nationwide April 2.

## Now Hear This

The bill [S. 882] recognizes that a ton [of emissions] avoided is as valuable as a ton reduced. ...[It] ensures that avoided greenhouse gas emissions will be equally registered and recognized in Department of Energy programs.

—Joe Colvin, NEI president and chief executive officer, testifying March 30 before the U.S. Senate Energy and Natural Resources Committee in support of S. 882—the Energy and Climate Policy Act of 1999.



## Q&A With Rep. Joe Knollenberg

# House Group Fosters Communication on Nuclear Issues

**R**ep. Joe Knollenberg (R-Mich.), together with Rep. John Spratt (D-S.C.), took the lead in creating a House Nuclear Issues Working Group, formalized this month as a Congressional Member Organization (which pursues common legislative interests). Nuclear Energy Insight asked him about plans for the group.

**Insight:** What is the role of the working group in the House?

**Knollenberg:** The Nuclear Issues Working Group has been an informal group of members and staff interested in nuclear technology and policy issues. We attended a few briefings on nuclear technology and in general worked to stay on top of nuclear issues and promote open discussions between offices.

This spring, Congressman John Spratt and I took the steps to formalize this group. On April 5, it was registered as a Congressional Member Organization.

The working group will foster open communications on issues involving nuclear science, technology and policy and will work to promote greater understanding of nuclear-related issues. Nuclear science plays a vital role in our economy and it is equally important that our awareness of nuclear issues is at the highest levels.

Expos, speeches, panel discussions, films and debates are all in the works. Our aim is to present all sides of nuclear issues such that informed and intelligent decisions can be made. I believe the group can also be a forum for moving bipartisan legislative approaches to nuclear issues.

**Insight:** Will you use the group to inform members about environmental and other benefits of nuclear energy?

**Knollenberg:** The larger purpose of the group is to deal with any and all things involving nuclear technology and nuclear policy. Without a doubt that cuts a wide swath involving aspects of nuclear medicine, food irradiation, space power supplies, fusion, and of course nuclear power production.

Now, the benefits, environmental and otherwise, are numerous. Nuclear power is a strong component of our overall energy mix, and most importantly an environmentally friendly component. I think it's appropriate to identify the comparison of nuclear power generation to other means of power generation.

**Insight:** Will you work to increase membership in the working group? Is it bipartisan?

**Knollenberg:** We definitely will work to increase membership. As far as I'm concerned, every member of Congress should be involved. Every congressional district features some nuclear-age technology at work: a national laboratory, a university research program, a grocery store with food that

has been protected with nuclear technology, a DOE facility, a nuclear power plant, a hospital, spray-painted cars, flat-screen televisions, fluorescent lights, etc. Nuclear technology affects all of us, and we should all be involved with improving our understanding of things nuclear, especially given the often-flawed media coverage.

The group is absolutely bipartisan, and we will continue to allow each side of issues to be aired. Congressman John Spratt and I are co-chairs. We will work closely together to involve as many members and staff as possible.

**Insight:** The Department of Energy has requested \$52 million for nuclear energy research. Would you propose a larger amount?

**Knollenberg:** Nuclear science has great promise, and only sufficient R&D investments will help us realize that promise. The NERI [Nuclear Energy Research Initiative] is a great start toward reinvesting DOE's nuclear energy R&D efforts through competitive, peer-reviewed applications. The current assortment of projects represents an excellent combination of what academia, industry and government can accomplish together.

Just as important are the advanced technologies being developed under the Nuclear Energy Plant Optimization (NEPO) program, which we started just this fiscal year.

The \$35 million requested for NERI and the \$5 million for NEPO in the FY 2001 budget proposal are undoubtedly steps in the right direction. And I am encouraged by the addition of an international component into the program.

I was disappointed with the administration request of only \$12 million in funding for the university assistance program. The U.S. has always been a world leader in nuclear technology, and we need to work hard to ensure that this remains the case.

Just last month, we were all encouraged to learn of the approval of the Calvert Cliffs relicensing application. There are many more plants either already in the process or considering relicensing. The advances from the NEPO program will ensure that the nation's nuclear plants are operated in the safest and most reliable fashion.

# 'Clean Energy Now'? We've Got It!

One might be forgiven for thinking that Earth Day 2000's 30th anniversary theme—Clean Energy Now!—was chosen with nuclear energy in mind.

The nation's 103 nuclear power plants generated 728 billion kilowatt-hours of electricity last year, meeting about 20 percent of U.S. demand. And they produced that power without emitting any carbon dioxide, sulfur dioxide or nitrogen oxides into the atmosphere.

U.S. nuclear plants have contributed to clean air in another way, too. For example, had the country relied on fossil fuel-fired plants instead of nuclear power plants, emissions of sulfur dioxide would have been 3.9 million tons higher in 1999 and emissions of nitrogen oxides, 582,000 tons higher.

Although the Clean Air Act doesn't include restrictions on carbon emissions, the U.S. administration has agreed to voluntarily reduce greenhouse gas emissions to 1990 levels by this year. Nuclear energy makes a vital contribution to this commitment. U.S. nuclear plants avoided the emission of 163.8 million metric tons of carbon in 1998.

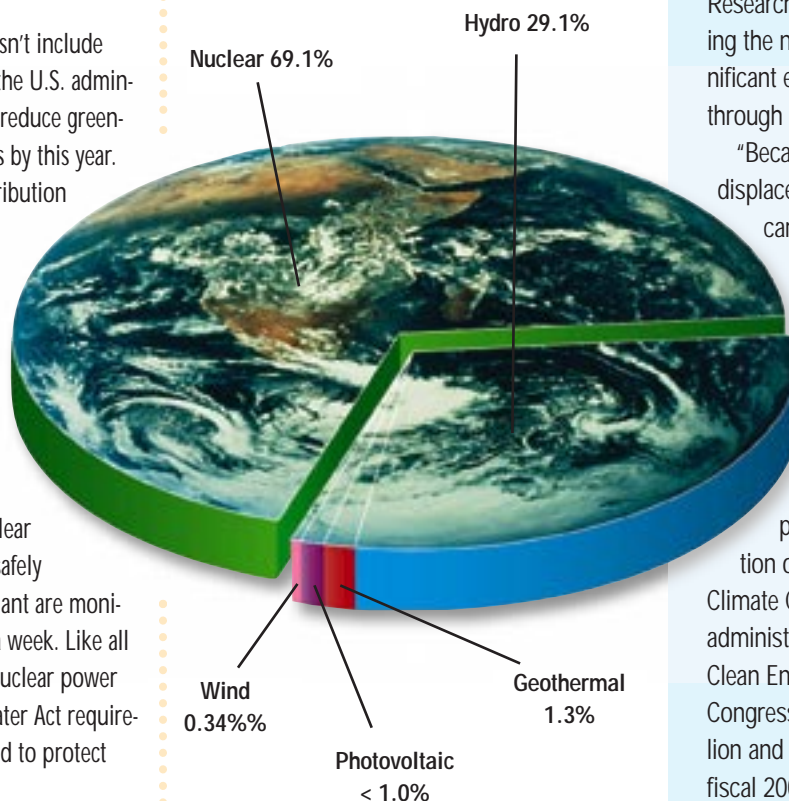
Nuclear plants are good stewards of the environment in other ways, too. The small volumes of waste products produced by the plants—including used nuclear fuel—are carefully contained and safely stored. Radiation levels at every plant are monitored 24 hours a day, seven days a week. Like all steam-electric generating plants, nuclear power plants must meet federal Clean Water Act requirements and state standards designed to protect water quality and aquatic life.

At most nuclear plants, there's a nature park or wildlife sanctuary. Through such environmental protection programs—many of which date back 20 years or more—the nuclear energy industry is working to protect the fish, mammals, reptiles, birds and plants found on or near nuclear

power plant sites.

Nuclear energy and the nation's other emission-free sources of electricity—hydropower, geothermal, photovoltaic and wind—are friendly to the environment. They produced 1.05 trillion kilowatt-hours of electricity in 1999—29 percent of total U.S. electricity generation. Nuclear energy was the leading non-emitting source, accounting for 69 percent of all clean energy produced. Hydro accounted for 29 percent, geothermal for 1.3 percent, photovoltaic for less than 1 percent and wind for 0.34 percent.

America has clean energy now. And with most nuclear plants expected to renew their operating licenses, the nation will have clean energy in the future, too.



**Emission-free generating sources supply almost 30 percent of America's electricity. Of that, nuclear energy provides the greatest share—almost 70 percent.**

## DOE Renewables Official Says Nuclear Energy Is Needed

The Energy Department official responsible for the agency's energy efficiency and renewable energy programs says there's a need for nuclear energy.

At a House hearing last month, DOE's Dan Reicher said that two nuclear energy R&D programs are key to the agency's commitment to address the challenges of clean air and climate change.

The two programs—the Nuclear Energy Plant Optimization program and the newly proposed International Nuclear Energy Research Initiative—are essential to continuing the nation's strong record of realizing significant energy savings and improvements through technological advances.

"Because a typical nuclear power plant displaces about 1.2 million metric tons of carbon-equivalent greenhouse gases per year, each year of license extension of a power plant significantly reduces greenhouse gas emissions," said Reicher, DOE assistant secretary for Energy Efficiency and Renewable Energy.

However, nuclear energy R&D programs represent a very small fraction of the total funding provided in DOE's Climate Change Technology Initiative and the administration's newly proposed International Clean Energy Initiative. If approved by Congress, NEPO would be funded at \$5 million and International NERI at \$7 million for fiscal 2001.

Subcommittee Chairman Ken Calvert (R-Calif.) observed that the administration "continues to put all of its eggs in one basket, the renewable and energy efficiency basket, while ignoring fossil fuels and nuclear energy."

# The Compassionate Physicist

**H**er laboratory was a cold, drafty hangar in Paris. There, surrounded by beakers, Marie Curie made a discovery that has touched the lives of people around the world. That's just what she would have wanted.

Curie unlocked the secret of radioactivity—a term she coined. But she did much more. She saw the possibilities of its use. Driven by her desire to ease human suffering, Curie helped found the Radium Institute at the University of Paris. There, she oversaw the production of radium for use in treating patients with malignant tumors. *The New York Times* celebrated her visit to the United States in 1921 with the headline: "Madame Curie Plans To End All Cancers."

From that first application of radioactivity have come such beneficial uses as modern cancer diag-



PHOTO COURTESY OF TEXAS A&M UNIVERSITY

*Helene Langevin-Joliot—granddaughter of Marie Curie—discusses her grandmother's work with Marvin Adams, associate professor of nuclear engineering at Texas A&M University, and his son, David.*

on the Texas A&M University campus that featured some of the laboratory instruments Curie used in her work. Langevin-Joliot is director of research emeritus at the National Center for Scientific Research in Paris.

Over the next two years, the exhibit—*The Legacy of Marie Curie: One Hundred Years of Science Innovation*—will travel around the United States. For information on the exhibit, see <http://www.tamu.edu/women-in-discovery>.

• nosis and therapy, food irradiation and electricity  
• generation.

• Curie's legacy was celebrated last month in  
• Texas. To honor her grandmother's discovery of  
• radium, Helene Langevin-Joliot opened an exhibit

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## NUCLEAR ENERGY insight

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