

insight99

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Twenty Years After Three Mile Island: No Longer Your Father's Nuclear Industry

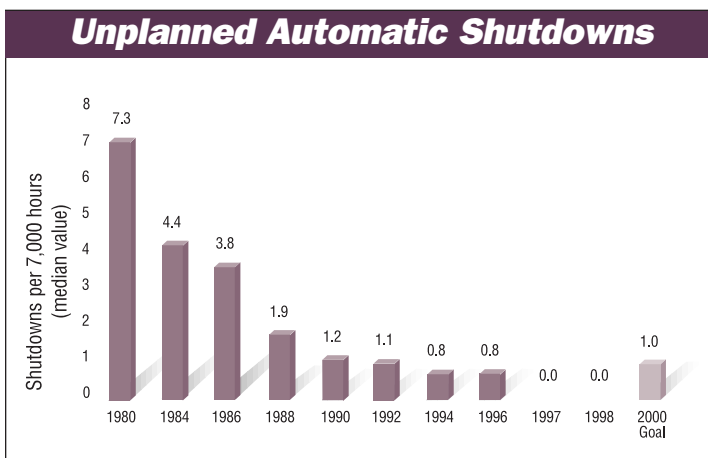
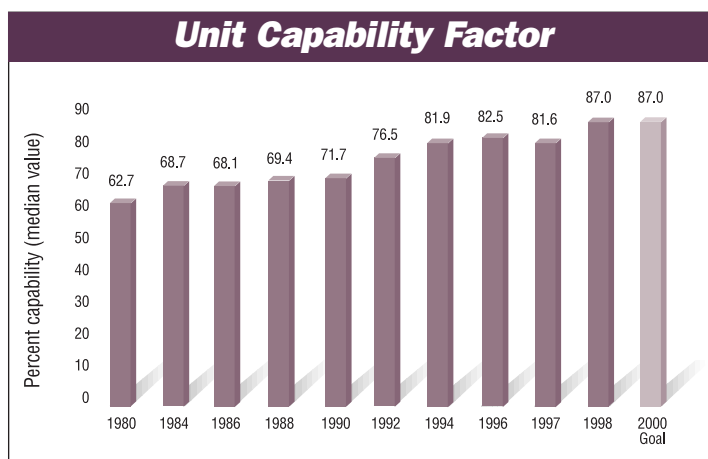
What a difference 20 years makes. When a simple stuck valve led to a partial fuel melt at the Three Mile Island nuclear power plant on March 28, 1979, the nuclear energy industry became synonymous with public fears of nuclear technologies.

Today—in response to post-accident recommendations by the presidential Kemeny Commission and fundamental changes within the industry—most U.S. nuclear power plants epitomize safety and operational excellence.

In a dramatic nationwide turnaround, every indicator of U.S. plant performance has shown significant improvement since the industry began tracking them in the early 1980s.

For example, according to the latest figures from the World Association of Nuclear Operators:

■ Unplanned automatic shutdowns have fallen from a median of 7.3 per nuclear plant in 1980 to zero during the past two years.



How far has the nuclear industry come since Three Mile Island? Capability factor, which measures the percentage of electricity a plant can generate, has soared 40 percent since 1980, while the number of unplanned automatic shutdowns has fallen to zero.

■ The industrial safety accident rate declined more than 80 percent, from 2.1 lost-time accidents per 200,000 worker hours to less than 0.3 in 1998, making the commercial U.S. nuclear power industry one of the safest places to work in the world. ■ Unit capability factors at U.S. nuclear plants have soared nearly 40 percent, from a median of 62.7 percent in 1980 to 87 percent last year. A high capability factor, which measures the percentage of maximum electricity generation a plant is capable of supplying, indicates effective and efficient plant operations.

Clearly, this is no longer your father's nuclear energy industry.

That's largely because the industry—reminded of the fact that nuclear energy is more than just another way to make steam for electric generation—took matters into its own hands following the accident.

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"Government or no government, we in the industry are not satisfied [with] the way things were," said the late Bill Lee, president of Duke Power, during an interview on ABC's "Good Morning, America" six months after the accident. "And we've taken a lot of steps...to give additional assurance that we won't have such an accident in the future."

Lee later said that "the positive thing that came out of Three Mile Island was the realization by the nuclear utilities that compliance with regulations did not necessarily mean safety, and the realization that we're all held hostage by the performance of the weakest among us."

Perhaps the most significant response by the industry was the creation in 1979 of the Institute of Nuclear Power Operations (INPO), which launched a number of programs to help nuclear utilities achieve excellence in their operations. These programs include:

- performance objectives and criteria for nuclear plant operations and corporate management
- guidelines and good-practice documents to help plants meet performance objectives
- evaluations of plant and corporate performance
- special assistance visits at the request of utilities
- analysis and dissemination of lessons learned from industry operating events.

Utilities also upgraded and broadened training programs for operators and management. Today, most nuclear plant jobs require workers to graduate from training programs accredited through the INPO-administered National Academy for Nuclear Training.

As a result of INPO and

the industry working together, "the probability that another accident like TMI will occur is considerably less now," says Jim Rhodes, chairman and president of the organization.

"A way of measuring that would be the number of significant events per unit per year, which has gone down about 60-fold since the mid-1980s," Rhodes says. According to the Nuclear Regulatory Commission, the number of significant events fell from 2.38 per unit in 1985 to 0.04 in 1998.

Just as important, Rhodes adds: "An industrywide emphasis on emergency preparedness and emergency operating procedures has resulted in a tremendous improvement in the ability to deal with an event like TMI, if necessary."

Also crucial to the industry's turnaround since the 1979 accident has been nuclear utilities' commitment to information sharing.

"The biggest thing that the industry learned from Three Mile Island was how much co-dependence we have on others and the value of sharing lessons learned—both successes and failures," says Mike Wadley, president of nuclear generation at Northern States Power. "It comes down to leveraging the industry's operating experience, not just your own."

Had sharing of lessons learned been in vogue in the 1970s, the accident at Three Mile Island might have been prevented. Just weeks before, the Davis-Besse plant in Ohio suffered a stuck safety valve, similar to the problem that plagued TMI 2. Davis-Besse's operators diagnosed the problem before a loss of coolant and pressure in the reactor could cause damage to the reactor core.

That information, however, was not shared with other nuclear power plants.

Today, such lessons would be widely disseminated, as the industry now goes to great lengths to share all relevant experiences. And that will continue, even after the transition from cost-of-service—where nuclear utilities' rates are predetermined—to a competitive environment—where companies will look for every advantage to improve their financial position, says Erle Nye, chairman and chief executive of Texas Utilities Co.

"Too much good has come from information sharing and benchmarking not to continue it," Nye says. For example, benchmarking is at the root of the breathtaking rise in electricity production and plant efficiency over the years.

And what an ascent it has been.

In 1980, the industry's capacity factor was 57.6 percent. In 1998, the industry average hit a record high of 79.5 percent. (Capacity factor is the measure of a plant's

actual electrical output vs. its potential output.)

Why?

"Because plants are sharing best practices, which elevates the performance of the entire industry," explains Nye, who also is the chairman of the Nuclear Energy Institute.

Performance improvements, in turn, have resulted in more cost-effective operations. Today, the average nuclear plant spends about 1.9 cents to generate a kilowatt-hour of electricity—a far cry from the mid-1980s, when the industry's production costs peaked near 3 cents/kWh. In fact, nuclear energy now ranks close to coal as the low-cost source of baseload electricity generation.

That kind of performance—coupled with the fact that nuclear plants supply nearly 20 percent of U.S. electricity without emitting greenhouse gases or air pollutants—has caused a growing contingent of Americans to rediscover the benefits of nuclear energy.

NOW HEAR THIS...

Louis Rukeyser: "[I]t will surprise many Americans who get their economic ideas from movies that you have said nuclear is having somewhat of a renaissance these days. What do you mean by that?"

Steven Fleishman: "Well, we are a big fan of nuclear these days. And what we're seeing is that with a move toward more fossil-emission regulations, the Kyoto accords, that there is more and more concern in the future that coal-fired generation will get more expensive. And nuclear plants are running much better these days. They're being operated much better. And...we're seeing a consolidation of ownership."

—Merrill Lynch electric-utility analyst Steven Fleishman on Wall Street Week with Louis Rukeyser, Jan. 29

Richardson's 'Promising' Waste Plan Lacks Promise To Meet Obligation

In his first appearance before the Senate Energy and Natural Resources Committee as energy secretary last month, Bill Richardson unveiled what he called a "promising" nuclear waste proposal. Richardson proposed that the Energy Department take title to the used fuel "and assume management responsibility" at the nation's 72 nuclear power plant sites.

In return for taking title, the administration would expect nuclear utilities to drop litigation against DOE for failing to meet its Jan. 31, 1998, deadline for beginning used fuel acceptance. Some estimates peg DOE's liability for damages at more than \$50 billion.

"You challenged me to come up with new ideas, and this is new," Richardson told the committee Feb. 25.

Committee Chairman Frank Murkowski (R-Alaska), however, told Richardson that his proposal falls short of solving the problem.

"What we demand is a date certain" by which DOE will meet its contractual obligation to begin accepting used fuel, Murkowski said. "The track record of the Clinton administration on nuclear waste is nonexistent."

Nuclear Energy Institute President and CEO Joe Colvin weighed in with a similar assessment, calling the take-

title proposal "a non-starter as a stand-alone concept."

Colvin added that "the White House is offering to take title to fuel it already owns, using billions of dollars from electricity consumers in a manner that could jeopardize the long-term goal of permanent fuel disposal. We look forward to continuing a dialogue on this critical issue. At the same time, Congress must pass reform legislation this year that provides the Energy Department with the ability to accept fuel while ensuring that the permanent disposal facility will be completed by 2010."

During his testimony, Richardson acknowledged that his proposal has shortcomings and told committee members that "we want this to be the start of a dialogue." He also urged lawmakers to "give me a little time before you pass your bill," which would reform the federal used fuel management program—in part by establishing a centralized, temporary used fuel storage facility.

During a similar hearing before a House subcommittee two weeks later, Rep. Joe Barton (R-Texas) told Richardson: "I do not like your dialogue proposal as a substitute for interim storage at one location.

"I might like it if we combine" the take-title proposal "while moving toward

interim storage," added Barton, chairman of the House Commerce Subcommittee on Energy and Water during the March 12 hearing. "We need to hear that at some point centralization of this waste is acceptable" to the administration.

While subcommittee members and Richardson agreed that a permanent repository is the ultimate goal of the nuclear waste management program, a number of lawmakers cast doubt on DOE's ability to open a facility by 2010. The biggest potential roadblock, Barton said, is that congressional appropriators may not provide funding needed to keep the repository program on track.

Historically, Congress has appropriated about \$350-370 million a year for Yucca Mountain site characterization. The project's costs will soar above \$1 billion a year, however, once construction begins around 2006. The result of a funding shortfall, Barton said, would be a repository that likely wouldn't open before 2020. In turn, the cost of Richardson's take-title proposal would greatly exceed DOE's \$2-3 billion cost estimate, which is predicated on the repository's opening in 2010.

By contrast, Barton said, a centralized used fuel storage facility—which would open around 2003—would cost about half as much. ■

"From policymakers to pundits, from the financial community to the people at our nuclear power plants, there is a growing awareness that this is a proven industry with more than 2,000 years of operating experience—and with a product that will become increasingly valuable as we tackle the demands of the 21st century," says NEI President and CEO Joe Colvin.

"America's nuclear plants are poised for competition because the industry has been doing the right things—and it has

done them well—since the Three Mile Island accident," Colvin said.

Perhaps the most dramatic evidence of the industry's turnaround during the past two decades came last year with the first-ever acquisitions of operating U.S. nuclear power plants.

One of those plants—ironically—was the surviving unit at Three Mile Island.

Twenty years ago, the notion that anyone would want to be associated with Three Mile Island would have been unthinkable. But like the rest of the

industry, TMI 1 rededicated itself to safety and operational excellence.

So much so, that in addition to being the first nuclear plant in the nation to be acquired (when its owner decided to get out of the generation business), Three Mile Island 1 boasts the world record for continuous operation by a light water reactor—616 days, 23 hours.

What a difference 20 years has made—both for Three Mile Island and America's commercial nuclear energy industry. ■

Bye, Bye, E. Coli

FOURTH IN A SERIES

Bacteria-tainted foods needlessly kill 10,000 Americans each year and make millions more sick. Needlessly, because there's a harmless, yet proven, weapon available to combat food-borne illness and protect those most vulnerable: food irradiation.

While some kids "would rather die" than eat school lunches, there's no reason that should be a possibility—not since the government added red meat to the growing list of foods it permits to be irradiated.

Steak tartare lovers, rejoice. You now can relax and enjoy your raw beef, thanks to the U.S. Department of Agriculture's Feb. 12 announcement that it will add red meat to the growing list of foods it permits to be irradiated.

Irradiation is a decades-old technology that employs gamma rays to eliminate and reduce bacteria—including listeria, salmonella and potentially deadly E. coli. Subjecting food to gamma rays does not make it radioactive, and extensive studies have not found any harm in irradiated foods.

While irradiation is "no

silver bullet," Agriculture Secretary Dan Glickman said that its use on red meat could "provide consumers with an added measure of protection."

Interest in allowing irradiation of red meat peaked in mid-1997, after a Nebraska processing plant was forced to close and destroy 25 million pounds of meat possibly contaminated by E. coli. The Food and Drug Administration—after three years of limited activity on a petition to do so—last December approved irradiation of red

meat.

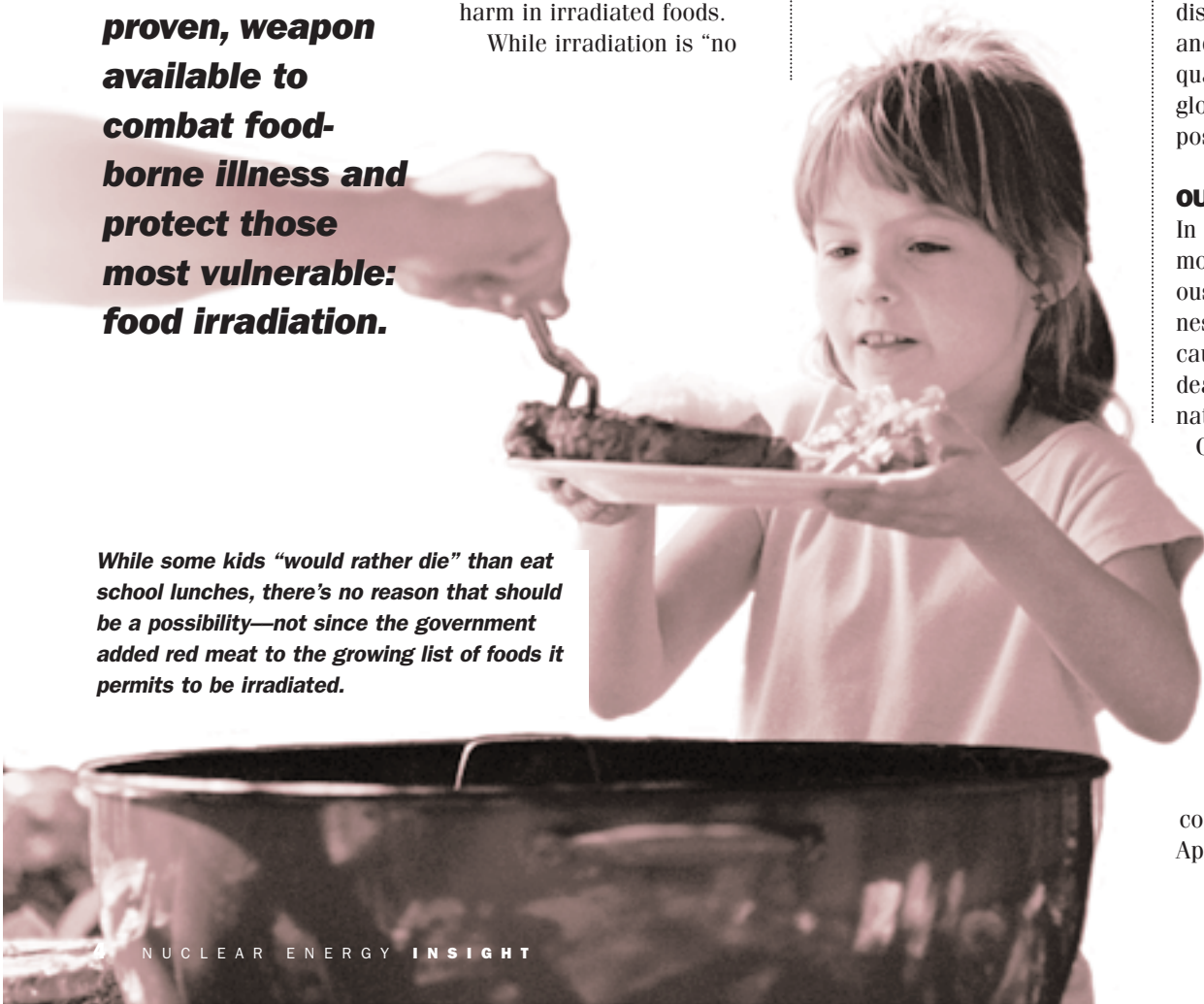
The United States is among more than 35 countries that permit irradiation of certain foods. In addition to red meat, since 1963, U.S. government agencies have approved irradiation of spices, wheat and flour, potatoes, pork, fruits, vegetables and poultry.

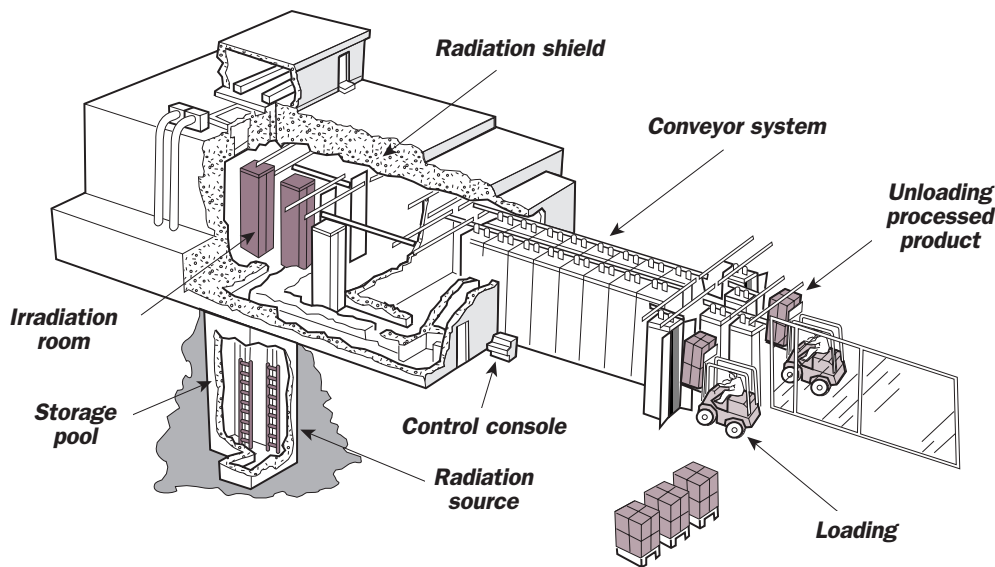
The World Health Organization in 1992 called food irradiation a "perfectly sound food-preservation technology." The head of the group's food safety unit said irradiation is "badly needed in a world where food-borne diseases are on the increase and where between one-quarter and one-third of the global food supply is lost post-harvest."

OUNCE OF PREVENTION

In the United States alone, more than 6.5 million serious cases of food-related illnesses occur each year, causing more than 10,000 deaths, according to the national Centers for Disease Control and Prevention.

"Irradiation can help make our nation's food supply safer, and provide a greater degree of protection against foodborne illness to all consumers, especially the most vulnerable populations: young children, the elderly and the immune-compromised," said Rhona Applebaum, executive vice





In a typical irradiation facility, pallets of food are moved by conveyor belt to a shielded irradiating room, then returned to forklifts, which load the food for shipping to grocery stores. The process involves no human exposure to radiation and results in a bacteria-free product.

president of scientific and regulatory affairs for the National Food Processors Association.

For years, food irradiation has been an industry waiting for a market—despite the growing list of government-approved uses.

Sure, a handful of small grocers around the country have carried a limited assortment of irradiated food. Yet for every store like Carrot Top in Glenview, Ill.—which since 1992 has done a booming business selling irradiated fruit—there are countless others that believe consumers are not interested in irradiated foods, regardless of the health benefits.

Last year, the head of the agribusiness ConAgra said, “I know I speak for the entire food manufacturing industry when I say food safety is and always will be our number one priority.” President and CEO Bruce Rohde added that “ConAgra stands ready to use irradiation technology once public

acceptance of irradiation becomes stronger and when irradiation is commercially available.”

Well, it seems there already exists a substantial number of consumers ready to accept irradiated foods.

A 1998 survey by the Grocery Manufacturers of America and the Food Marketing Institute shows 80 percent of consumers say they would be likely to purchase a food product for themselves or their children if it were labeled, “irradiated to kill harmful bacteria.” Some 60 percent of consumers say irradiation’s effect on both harmful bacteria and nutrition is “very important.”

PUBLIC TRUST

The survey, *Consumers’ Views on Food Irradiation*, also found that when it comes to sources of information on irradiation, more than 90 percent of consumers say they would trust the medical community. That’s significant, because the American Medical

Continued on page 6

The Truth About Food Irradiation

Fearmongers have armed themselves with an arsenal of arguments against food irradiation. On nearly all counts, however, their claims miss the mark.

Here are some of the claims—and the truth—about food irradiation:

Claim: *Irradiation causes food to become radioactive.*

Wrong. Irradiation does not make food radioactive and therefore does not increase human exposure to radiation.

Claim: *Irradiation changes the molecular structure of food, creating new and deadly substances.*

The former is partly true; the latter is false. Like grilling, freezing and canning, irradiation can rearrange the molecules of certain foods—but only to degrees considered insignificant by scientists. The real controversy involves so-called unique radiolytic products. Opponents claim the process cre-

ates toxic substances unique to irradiated food. Yet scientists—after more than three decades of study—can’t find any such evidence.

Claim: *Irradiation contributes to the proliferation of nuclear waste.*

This claim is false on two counts. First, the two sources of ionizing radiation used in food irradiation—cobalt-60 and cesium-137—decay to nonradioactive isotopes. Second, once spent, the isotope-filled rods can be—and generally are—recharged for reuse.

Claim: *Vitamins and minerals are sacrificed during irradiation.*

Irradiation causes a slight depletion of certain nutrients and vitamins, particularly vitamins A, B, C, E and thiamin. However, the effect is considered far less than that caused by cooking. ■

AFL-CIO CITES NUCLEAR AS INTEGRAL PART OF DIVERSE ENERGY SUPPLY

The AFL-CIO is on record supporting the nuclear energy industry.

The labor federation's Executive Council Feb. 17 unanimously adopted a first-time resolution supporting a national policy of fuel diversity in the electric utility industry, including the continued use of nuclear energy and relicensing of nuclear plants.

"While our nation considers restructuring the electric utility industry and the implications of the Kyoto Protocol [on reducing greenhouse gas emissions], the licenses to operate many of our nuclear and hydro electric facilities will expire. While these events dovetail with respect to timing, they conflict with respect to results," the AFL-CIO said.

"[I]f nuclear and hydro facilities are not relicensed, what generating sources will be used to produce electricity? ...We must maintain all current generating options, including fos-

sil fuels, nuclear, hydro and renewables to ensure a stable, reliable and low-cost supply of electricity for the United States," the federation said.

MIDWEST UTILITIES FORM NUCLEAR MANAGEMENT COMPANY

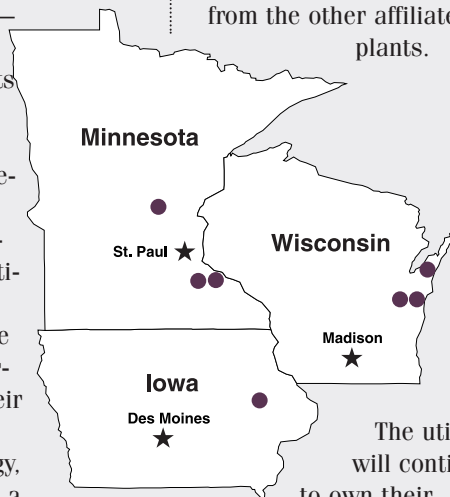
Northern States Power Co., Wisconsin Electric Power Co. and Wisconsin Public Service—which operate six nuclear units among them—have formed a nuclear management company to sustain long-term safety, optimize reliability and improve the operational performance of their plants.

Alliant Energy, which operates a nuclear unit in Iowa, is seeking approval from the Securities and Exchange Commission to join later.

"We intend to maximize the benefits of nuclear power in meeting our customers' expanding energy

needs," said Michael Sellman, president of the new company. He added that the new venture will help "position the utilities for success in a rapidly changing industry."

Overall plant operations will continue to be provided by the same plant personnel, with the additional benefit of having the best practices available from the other affiliated plants.



The utilities will continue to own their plants, be entitled to the electricity generated at the plants, and retain the financial obligations for their safe operation, maintenance and decommissioning.

The new company will manage Northern States

Power's Monticello and two-unit Prairie Island plants in Minnesota, Wisconsin Electric's two-unit Point Beach plant, the Kewaunee plant operated by Wisconsin Public Service, and later, Alliant Energy's Duane Arnold plant.

NUCLEAR 'ESSENTIAL' TO CARBON EMISSION REDUCTION, SAYS ENGINEERING SOCIETY

To come even close to achieving the global carbon emission reduction targets identified in the 1997 Kyoto Protocol, U.S. environmental policy must account for the retention of nuclear-generated electricity. So says a task force established by the American Society of Mechanical Engineers.

The task force reported last month that the carbon emission reductions envisioned by the Kyoto Protocol cannot be achieved in the time frame proposed—by 2008-2012. But, with a more realistic time frame, global carbon dioxide concentrations could be stabilized—provided the world uses nuclear energy and

FOOD IRRADIATION *from page 5*

Association is on record supporting food irradiation.

The remaining 10 percent might be impressed to know that irradiated food also has the seal of approval of the National Aeronautics and Space Administration.

"Since the 1960s, NASA has included irradiated foods on the menus of its space flights," said the Food Processors' Applebaum.

"The irradiated products on NASA flights are as nutritious as non-irradiated foods," she added. "More importantly, these foods pose no risk of foodborne illness to the astronauts, since irradiated foods are absolutely free of any harmful bacteria. Obviously, food safety must be an important part of the Space Shuttle's flight plan."

Food safety is becoming increasingly important here

on Earth, as well, said Tim Hammonds, president and CEO of the Food Marketing Institute.

Hammonds noted that "as food safety concerns continue to grow, we're finding that consumers are more ready than ever to hear the facts about irradiation. Consumers are tuning into the message from health officials, leading scientific experts, academics and the federal government

that irradiation is a safe and effective tool to help combat foodborne illness."

The head of the Grocery Manufacturers of America agrees.

"Irradiation is likely to be generally accepted by Americans and be as useful to their health and safety as pasteurization was for milk decades ago," said Manly Molpus, the group's president and CEO. ■

renewables.

For the United States, this necessitates license renewal for operating nuclear plants, the development of advanced nuclear plant designs and—ultimately—the addition of nuclear capacity, says the task force of government, university and industry experts.

It's "essential" that U.S. environmental policy acknowledge the need for additional nuclear power plants "to meet a growing demand for electricity while pursuing the carbon emission reductions" required under the Kyoto Protocol, says the task force.

AMERGEN CONSIDERS VERMONT YANKEE PURCHASE

Convinced that well-run nuclear power plants will be money-makers in a competitive market, AmerGen Energy is exploring the acquisition of the Vermont Yankee nuclear power plant in Vernon, Vt.

"The trend toward nuclear operating companies like AmerGen is very

positive for the industry," said Brian Cosgrove, Vermont Yankee's director of public affairs.

"Nuclear operating companies can focus their vast array of resources and expertise to run safe, efficient and economical plant," Cosgrove said.

The Vermont Yankee board of directors granted AmerGen—a joint venture between

regulatory steps would be needed before the sale is final—a process that would take eight to 12 months.

A group of 13 New England utilities owns Vermont Yankee—a 540-megawatt plant in operation since 1972.

Formed in 1997, Philadelphia-based AmerGen buys

GPU PUTS OYSTER CREEK BACK ON THE MARKET

Encouraged by an increasingly active market and the emergence of potential buyers, GPU Inc. has again posted a "For Sale" sign on its Oyster Creek nuclear power plant.

When GPU announced the sale of its Three Mile Island Unit 1 last July, it said it had been unable to find a buyer for Oyster Creek. Two options remained for the plant, said the utility: early retirement or operation to 2009, when the New Jersey plant's license expires. GPU plans to exit the electricity generation business to concentrate on transmission and distribution.

The pending sale of TMI 1 and the announced sale of Boston Edison's Pilgrim nuclear plant to Entergy Nuclear make it clear that a renewed effort to sell Oyster Creek is "the right course to take," said Fred Hafer, chairman, president and CEO of GPU.

Oyster Creek, a 650-megawatt plant, began operating in 1969. ■



Philadelphia-based PECO Energy and British Energy—exclusive rights Feb. 25 to conduct a due diligence review and negotiate a possible agreement to purchase the company's assets.

If the four-month review is positive and leads to purchase negotiations, several

and operates nuclear plants in the United States.

Last July, the company broke new ground with its historic offer to buy Three Mile Island Unit 1 near Harrisburg, Pa. Once approved, it will be the first-ever acquisition of an operating nuclear plant in the United States.

Repository Design: Safe to a Fault

Despite claims by Yucca Mountain's opponents, the proposed repository will be designed to withstand earthquakes far greater than those that strike southern Nevada, experts told the House Commerce Subcommittee on Energy and Water last month.

At a Feb. 10 hearing, Nuclear Regulatory Commission Chairman Shirley Ann Jackson testified that the nuclear waste

repository will be designed to withstand earthquakes with a magnitude of 6.5-7.0 on the Richter scale. The difference between the 3.0-magnitude earthquakes that typically hit the region and a 7.0-magnitude quake, would be "a factor of 10,000," Jackson explained.

Jared Cohon, chairman of the Nuclear Waste Technical Review Board, added that "the location of the most recent quakes

are no surprise." He said a repository "would not be affected by a quake" of the magnitude experienced in southern Nevada—even one equivalent to the 4.7-magnitude quake that struck Jan. 27.

In recent months, a number of Nevadans—including the state's new governor, Kenny Guinn—have claimed that Yucca Mountain should be disqualified as an earthquake zone. ■

Nuclear Energy: Striking a Balance Between Energy, Environmental Demands

Meeting growing electricity demand and ensuring environmentally acceptable development needn't be an either/or proposition, says an international working group of a highly regarded U.S. think tank.

Not with the availability of nuclear energy.

In fact, nuclear energy is essential to striking a balance between burgeoning world demand for electricity and environmentally acceptable development, concludes the Atlantic Council, a private, non-partisan organization dedicated to promoting effective U.S. foreign policies and cohesive U.S. international relationships.

The council also identified renewable sources and energy efficiency programs as key players.

Fossil fuels will remain the dominant energy sources for the foreseeable future, the council says. A broad range of energy options, including nuclear energy, will be necessary for the long term.

The council released its report—*An Appropriate Role*

for Nuclear Power in Meeting Global Energy Needs—at a Feb. 23 news conference at its Washington, D.C., headquarters.

The report is the second and final installment of a council program investigating the role of nuclear energy in meeting future global energy needs. The first report—

“Nuclear power really isn't the issue; sustainable development is,” said Guertin. “All forms of energy need to be considered, and governmental concerns about the environment and global warming should underscore certain advantages of nuclear energy.”

The council selected a 72-

Governmental concerns about the environment and global warming should underscore certain advantages of nuclear energy.

—Donald Guertin
Atlantic Council

released a year ago—examined the role of nuclear energy in Asia.

The object of the study was to foster open and objective discussion of nuclear energy free of the ideological divisions common to policy discussions of this type, according to project co-director Donald Guertin.

member international working group of energy policy makers, social scientists and economists to participate in the study. Slightly less than half had direct nuclear energy experience.

Citing the long lead times required to manage major energy policy shifts and develop innovative technologies, the consensus report advocates an early and active role for both the private and public sectors.

The committee recommended that governments accept overriding responsibility for management of radioactive waste and used fuel, and accelerate solutions—in cooperation with private enterprise—for both temporary storage and permanent isolation.

Other recommendations included:

- Countries must cooperate to harmonize strict international standards for safe nuclear plant operations.
- Governments should ensure the long-term financial integrity of their power sectors and incorporate the full costs of all forms of electricity in electric rates. At the same time, credit should accrue to nuclear power facilities and other energy sources for their role in reducing greenhouse gas emissions.
- Governments should take the lead in long-term research and development efforts for all energy options. They should focus domestic and international nuclear R&D on improving safety, developing proliferation-resistant technologies, and reducing and managing radioactive waste and used fuel.
- The nuclear industry should improve public communication by taking up more positive and open positions.

During the news conference, a number of panel members said governments need to ensure an ample supply of trained personnel to build and operate future nuclear plants. One recommended private and public efforts to enhance nuclear engineering and other technology training programs.

Panel members also stressed the need for cooperative international programs aimed at enhancing nuclear energy safety worldwide.

A copy of the report is available at the Atlantic Council's Web site at <http://www.acus.org>. ■

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