

# Two opinions on nuclear power

**Pro:** by Pam Claxton  
Staff Writer

In the early days of the horseless wagon, it was required that a man on foot precede it by 100 yards while waving a red flag as a warning. As cars became more sophisticated and their acceptance grew, such precautions were no longer deemed necessary. The nuclear industry is reaching such a point, according to James R. Bohannon Jr., a nuclear engineer and associate professor at N.C. State.

Bohannon, who has served as a consultant to the U.S. Air Force's nuclear safety directorate, is publishing a manuscript on quality assurance engineering for nuclear facilities, feels that the degree of safety clamored for by environmentalists need to be specified.

He expressed complete confidence in current nuclear plant controls and felt that there are enough checks and balances within the nuclear plants so that nothing could go wrong.

However, safety is a question of magnitude, and the degree to which a nuclear plant is safe is an economic problem. Each incremental unit of safety has an incremental cost in terms of efficiency and these could be increased to the point of absurdity. Absolute safety is not conducive to efficiency—maximum safety would entail shutting down the plant. This is comparable to not driving a car because people get killed on the highways.

Long before a company can even consider scratching the ground to build a nuclear plant, it must submit a detailed report containing information on 1) the design and location of the plant, 2) the safeguards to be provided and 3) comprehensive data on the site and its environment. These must be verified at six checkpoints to obtain a construction permit.

Though the Nuclear Regulatory Commission is the primary watch dog, other groups also have their eyes on the company's proceedings. Among these are the North Carolina Utilities Commission, the Department of Natural Resources and Economic Development, the N.C. Environmental Management Commission, the N.C. Department of Transportation, the U.S. Army Corp's of Engineers and the Federal Aviation Administration which checks out the height of the cooling towers.

The degree of human error is also relative in determining plant safety. According to Bohannon, the workers must be highly qualified. "They are an important investment. If one is incompetent and the plant must be shut

**Con:** by Jim Overton  
Tar Heel Contributor

The optimistic pronouncements of the utilities, the nuclear equipment suppliers and the federal government are being contradicted by the hard facts of the situation: nuclear power is an unsafe and uneconomical form of energy production.

Take for example the report "Nuclear Power Costs," prepared by the U.S. House Committee on Government Operations. After detailing the many yet unresolved problems with nuclear technology, the report reaches the conclusion: "Contrary to widespread belief, nuclear power is no longer a cheap energy source... It would be foolhardy to invest such enormous quantities of capital in one industry that is still so beset with problems at the expense of other industries and technologies."

What are the problems confronting the nuclear industry? First, we are rapidly exhausting our uranium supplies. The Atomic Industrial Forum has admitted that we will exhaust our domestic

down, there would be a loss of \$250,000 dollars a day."

Before a plant can go into operation, it must pass eight checkpoints and obtain an operating license. Many public hearings are held and the process takes so long to complete that the environmental report must be updated before the plant can go into operation.

Bohannon sees the NRC as a competent and adequately staffed organization. He said, "The NRC has matured rapidly and grown to accommodate increased regulation. Their inspectors are plain good snoopers." When the regulations are not adhered to, the inspectors, he claimed, "Just raise hell."

Dayne Brown, Chief of Radiation Protection at the State Public Health Department, also finds the NRC inspectors quite competent. He himself is an inspector, but state jurisdiction of radiation surveillance does not include "on site" areas at present. To his knowledge he said, "There have been no accidents at any operating nuclear plants in North Carolina which have had any potential offsite effect."

Brown finds the low level radiation emitted from nuclear plants to be insignificant, particularly when compared to naturally occurring radiation.

He has found that some local groundwater has a relative numerical magnitude of radiation, surpassing the maximum NRC levels allowed within the plants. This radiation is a different sort than that found in the plants, but it is potentially far more hazardous. Brown said that nuclear plants have not affected the radioactivity of local groundwater.

Bohannon terms question of radioactive wastes a "political problem"—technically it is solvable.

The newer of the nuclear reactors, such as the Carolina Power and Light Company's Brunswick facility near Wilmington, and the Duke Power Company's Shearon Harris project near Raleigh, have access to the most recent and therefore efficient and safe technology, according to Bohannon.

The radioactive waste is stored inside fuel assemblies within the plant. After about 100 years the radioactivity has diminished until it is insignificant.

In accordance with this view, Austin C. Thies, senior vice president of production and transmission, states in the Duke Power Company annual report (1977), "From an engineering standpoint, permanent storage of these wastes is not a problem. The technology already exists for converting these wastes to an insoluble form and for permanently isolating them from the environment."

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supplies of uranium by the start of the 21st century, at which time we will be dependent on foreign supplies—and in the same cartel situation we find with oil supplies. Meanwhile, the price of uranium has jumped over 600 percent in five years.

So far the nuclear industry has dangled two solutions to the problem before the public eyes: the breeder reactor and reprocessing. Despite the optimism of the industry, there are still no breeder reactors and no reprocessing plants. Even more damning, the Carter administration is reluctant to push forward with either technology, fearing the diversion of plutonium into weapons production and terrorist activity.

Even if we have enough uranium, it's not likely we'll be able to afford using it. For instance, the price tag on the Shearon Harris plant has jumped from \$1.1 billion in 1971 to \$4.2 billion in 1978, and is in danger of climbing even higher. Such rapidly escalating costs have forced the utilities to cancel or postpone over half of the reactors announced since 1972.

Those reactors the utilities have managed to complete have not performed as reliably as the industry had led us to expect, performing at about 55% capacity, rather than at the expected 70% mark. Recent studies have suggested an even more alarming problem: because of the continually upgraded safety standards for nuclear plants and the rapid disintegration of certain reactor parts, nuclear plants tend to perform even less reliably as they age. The studies show that this poor performance results in nuclear plants being 30 per cent more expensive than coal-fired units.

Finally, despite the assurances by the utilities that there are technical solutions to the problems of storing radioactive waste, we still have no national plan for storing and guarding wastes. In fact, the White House recently announced that there will be no solution to the problem for many years.

More important for the present, the waste storage problem suggests that nuclear power is already uneconomical. We still have no price tag on radioactive waste storage, or on dismantling old nuclear reactors (which have a lifetime of 30-40 years). In most cases, such real costs of nuclear power have not even been figured into the cost calculations that "prove" that nuclear power is so cheap. Once we add these very real costs to the budget, we find that nuclear power is far more expensive than its possible replacements.

All these economic considerations are compounded by the other crucial danger in the nuclear industry: its impact on the environment. Most ominously, there is the possibility of a major accident, which by some federal estimates could result in \$17 billion in damages, 30,000 deaths, and the contamination of an area the size of Pennsylvania. Although the chances of this severe a catastrophe are slim, there are many smaller incidents that can occur. There have been a number of accidents involving the escape of radioactive gases and substances far in excess of government standards. Even if one accepts the industry's assertions about the low statistical probabilities of a major accident occurring, we can expect one major accident and release of significant amounts of radiation every 10 years if the industry builds as many plans as they plan.

However, the extensive debate over these possibilities has obscured one other important fact: nuclear plants could

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Runoff pours from drainage pipe at Shearon Harris construction site.

## Debate

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Council of North Carolina, the Chapel Hill branch of ECOS, the local chapter of the Sierra Club, and the Chapel Hill-based Kudzu Alliance.

The most recent development in the national controversy came just last week, when the Health Research Group, an organization funded by Ralph Nader's Public Citizen lobby, cited 40 nuclear plants as the "most unsafe" in the country. The Nader group ranked the plants according to the percentage of their workers exposed in 1976 to 0.5 rem—a scientific measurement—of atomic radiation.

Duke Power's Oconee plant in Greenville, S.C. was ranked as the sixth most unsafe in the country. Carolina Power & Light's H. B. Robinson plant at Hartsville, S.C. was ranked 13th, and its Brunswick plant in Southport, N.C. was ranked 36th.

But a number of local experts, in addition to industry spokesmen, have disputed the Nader group's findings.

The Health Research Group admitted in its report that current federal regulations allow exposure of workers to 5.0 rem per year, but cited several radiation cancer experts who feel that the maximum exposure level should be reduced to 0.5 rem per year.

But Billy Webster, director of environmental radiation control for CP&L, said the HRC's standards were accepted by few experts.

James R. Bohannon, associate professor of nuclear engineering at N.C. State University, said in an interview that the Nader group was "simply misinformed," and noted the lack of citation of scientific verification in its report. Dayne Brown, chief of radiation protection at the N.C. Department of Public Health, pointed out that the 29 plants not cited by the Nader group may well have been omitted solely because they employ independent firms to transport and deliver nuclear fuel. Brown said that most radiation exposure occurs during handling of the fuel.

But worker exposure to radiation is only one of a host of extremely complex and divisive issues which the Nuclear Regulatory Commission has yet to settle. The NRC, which, unlike its predecessor, the AEC, does not encourage the development of nuclear power, must decide on revisions of regulations that will affect sales of nuclear technology abroad, and thus the long-range energy policies of the U.S. and a number of other countries.

The NRC will also be called on to determine general radiation emission levels, emergency systems, safeguards against sabotage and theft of atomic materials, guidelines for transportation and storage of atomic fuels, and regulations regarding the environmental effects of disposal of water used to cool reactors and generators. Perhaps the most difficult and controversial issue to be faced by the commission, however, will be the related questions of decommission of nuclear facilities and storage and disposal of the highly toxic and long-lived radioactive waste materials which are a by-product of the fission process.

In recent weeks the focus of local controversy over nuclear power has been on Carolina Power & Light's \$4.2 billion Shearon Harris facility, which is now under construction in southwestern Wake County near Apex.

It was reported last week that the four 480-foot high cooling towers at the plant will be built by the same company that is constructing the cooling towers at a West Virginia nuclear plant where 51 workers died April 27 when scaffolding collapsed.

The Occupational Safety and Health Administration cited the company, Research-Cottrell, Inc., for 10 "willful violations" and 10 "serious violations" after the accident at the

Monongahela Power Co. plant at Willow Island, W. Va. Research-Cottrell was fined \$105,000 by OSHA.

William E. Graham Jr., CP&L senior vice president and general counsel, said Research-Cottrell had received the contract for construction of the towers because its bid was considerably lower than other bids. Graham said CP&L was sure that a similar accident could be avoided at Shearon Harris.

It was also reported last week that CP&L has been charged with pollution of a stream that runs from the Shearon Harris site to the Cape Fear River. Charles Gardner, the state land quality chief, said state inspectors told CP&L engineers July 12 that the project violated sedimentation laws. CP&L had not maintained control devices to keep runoff from land clearing and dam construction from muddying Buckhorn Creek, Gardner said.

Spokesman Mac Harris of CP&L said however that the inspectors had not proven that the sediment came from the company's construction.

And most recently, the Public Staff of the N.C. Utilities Commission asked the commission to conduct an investigation into whether CP&L had bought too much land for Shearon Harris. CP&L has purchased 22,762 acres for the site, which as now planned will occupy only 10,723 acres, according to company officials.

M. A. McDuffie, senior vice president for engineering and construction, said Tuesday that the company bought the land in accordance with an earlier plan for the facility, which called for a 10,000 acre lake to be used to cool water from the plant's steam-powered turbine generators.

But a 1974 Environmental Protection Agency ruling required cooling towers to cool the water. McDuffie said CP&L wants to keep the land it has purchased, however, in hopes that the requirement will be changed. McDuffie said the company may not know whether it will need all of the land until the facility is finished sometime in 1990.

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